

DRAFT REPORT (VERSION 3)

**PROTOCOL DOCUMENT:
STEPS FOR TRANSLATING AND
ENTERING DATA INTO THE
MICROSOFT ACCESS OKANOGAN
BASIN MONITORING AND
EVALUATION PROJECT (OBMEP)
DATABASE**

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SUMMIT
Environmental Consultants Ltd.

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Reference: 652-01.05

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Dear Mr. Arterburn:

Re: Protocols for Translating and Entering Data (Draft Version 3)

Summit Environmental Consultants Ltd. is pleased to provide step-by-step protocols for translating and entering various database components into the Microsoft Access Okanogan Basin Monitoring and Evaluation Project (OBMEP) database.

Please contact me if you have questions or comments.

Yours truly,

Summit Environmental Consultants Ltd.

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Appendix A. Microsoft Excel Templates for Data Translation (on CD).

Appendix B. Microsoft Access OBMEP Database (on CD)

1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

Since May 2006, Summit Environmental Consultants Ltd. has been working with the Colville Confederated Tribes (CCT) to develop a fully-functional Microsoft Access database designed and constructed for the Okanogan Basin Monitoring and Evaluation Project (OBMEP). The OBMEP project includes many sampling efforts (data collected and managed by the CCT), specifically snorkel surveys, trap surveys, video surveys, habitat surveys, redd surveys, water chemistry analyses, and hourly river water temperature measurements. In addition to these sampling efforts, the CCT also manages data collected by other agencies such as: the Wells Dam Fish Passage data; the Department of Ecology (DOE) water quality, temperature and flow data; the United States Geological Survey (USGS) temperature and flow data; and the Environment Canada flow and temperature data. The purpose of this document is to provide step-by-step protocols for translating the database components that are downloaded from Trimble units or from the internet into the pre-designed OBMEP Microsoft Access database.

The approach used in writing these protocols is to provide a technician that potentially may not be experienced with data handling with the tools required to handle data in Microsoft Excel, Microsoft Word and Microsoft Access. Common database terms used in this document are defined in the glossary located at the end of this document (Section 19.0).

1.2 PROJECT OBJECTIVES

The general objective of this task is to develop step-by-step protocols for translating data from various file types (e.g., Trimble units, internet downloaded files) into the OBMEP Microsoft Access database.

Specific objectives of this project are to:

- Review the original data files;

- Modify the original OBMEP database design, if necessary to accommodate these data and operate efficiently;
- Develop preliminary protocols and electronic data entry forms (if applicable) for review by CCT staff;
- Conduct iterative discussions with CCT staff to simplify procedures, modify the design of the original files (if appropriate) and enhance the design of the OBMEP database; and
- Develop a final data transfer protocol document and OBMEP database design.

1.3 DATA ENTRY VS. TRANSLATION

There are two ways to enter data. The first way is to manually enter the data using pre-designed electronic entry forms that comprise the applicable fields and relationships from various tables in the database. Using these forms will ensure that all data remains relational. However, this way of entering data can be very time consuming. Data not collected electronically (i.e., recorded on paper) should be entered into the database using Microsoft Access entry forms.

The second way is to translate data already stored in electronic format is through Excel templates. This way is much more efficient but it is very easy for the database user to make mistakes when entering data this way (not keeping the fields consistent, omitting data types, etc.). Therefore, a thorough quality assurance/quality control (QA/QC) analysis (see Section 17.0) should be performed once the data has been imported to ensure the data remained relational and that data quality was maintained. For mass amounts of data, the use of Excel templates is recommended instead of entry forms as it is much more efficient.

1.4 ENTRY FORMS IN THE DATABASE

Entry forms have been created for the redd data, the snorkel data, the trap data, and the video data. These forms are located in the OBMEP database under the Forms tab (prefix “ENTRYFORM” for sorting purposes). The forms with the prefix “SubEntryForm” are sub

forms incorporated into complete data entry forms. The sub entry forms have not been designed for independent use and exist only as components of the complete data entry forms.

1.5 DOCUMENT LAYOUT AND APPENDICES

The next sections of this document provide protocols for various translating data from specific database components into the OBMEP database. Hints and extra notes are provided in the text boxes for additional help. The sections are as follows:

- Habitat data (collected by CCT staff using Trimble units; Section 4.0);
- Wells Dam Fish passage data (downloaded from the internet; Section 5.0);
- DOE water quality data (downloaded from the internet; Section 6.0);
- DOE hourly temperature data (downloaded from the internet; Section 7.0);
- Eureka water quality data (collected by CCT staff; Section 8.0);
- BoxCar hourly temperature data (collected by CCT staff; Section 9.0);
- DOE flow data (downloaded from the internet; Section 10.0);
- USGS flow and daily temperature data (downloaded from the internet; Section 11.0);
- Environment Canada flow and temperature data (downloaded from the internet; Section 12.0);
- Redd Survey data (collected by CCT staff; Section 13.0);
- Snorkel data (collected by CCT staff; Section 14.0);
- Trap data (collected by CCT staff; Section 15.0); and
- Video data (collected by CCT staff; Section 16.0).

Following this group of sections is a section on quality assurance/quality control (QA/QC; Section 17.0), a section describing how to create simple queries (Section 18.0), and finally a glossary (Section 19.0).

Appendix A (on CD) consists of the various Microsoft Excel (TEMPLATES) that accompany each of the database component sections. When working with a specific

database component, open the associated template for quick reference. The templates are as follows:

- 9 habitat templates (HIGHLIGHTED TEMPLATES.xls, HIGHLIGHTING, MASTER SAMPLE.xls, CANOPY.xls, CHANNEL.xls, HUMAN.xls, LGWOOD.xls, RIPARIAN.xls, SUBSTRATE.xls);
- Fish passage template (5.0 FISH PASSAGE TEMPLATE.xls);
- DOE water quality template (6.0 DOE WQ TEMPLATE.xls);
- DOE temperature template (7.0 DOE TEMP TEMPLATE.xls);
- Eureka water quality template (8.0 EUREKA WQ TEMPLATE.xls);
- Boxcar temperature template (9.0 BOXCAR TEMP TEMPLATE - OLD DESIGN.xls and 9.0 BOXCAR TEMP TEMPLATE - NEW DESIGN.xls);
- DOE flow template (10.0 DOE FLOW TEMPLATE.xls);
- USGS flow and temperature template (11.0 USGS FLOW TEMP TEMPLATE.xls);
- Environment Canada flow template (12.0 EC FLOW TEMPLATE); and
- Redd survey template (13.0 RED SURVEY TEMPLATE).

Appendix B (also on CD) consists of the current database (April 30, 2007 version).

2.0 METHODS

2.1 REVIEW THE ORIGINAL DATA FILES

Summit reviewed the original data files to identify database fields, key variables and field types. Unique queries were run on each field to determine the range of data that are collected, and to review the arrangement of fields and tables. The results of these queries were used to identify design modifications that will make the database run more efficiently.

2.2 MODIFY THE DATABASE DESIGN

The original OBMEP database design (received in July 2006) has been modified to resemble a fully-functional relational database. These modifications include addition of lookup tables and lookup fields that enforce referential integrity of the data, as well as indexing fields which will allow queries to run more efficiently. To facilitate data entry into the database, pre-designed entry forms and/or Excel templates can be used by users familiar with the database design.

2.3 DEVELOP PRELIMINARY PROTOCOLS AND ENTRY FORMS

Protocols were developed for the database components downloaded from Trimble units or from the internet. The simplest way to translate data from an electronic vertical spreadsheet into a horizontal database format is to complete the translation in Microsoft Excel. Using the following protocols in conjunction with the Microsoft Excel templates, it is easy to trace your steps if questions or problems arise.

On the other hand, the simplest way to enter data that is manually collected in the field (i.e., writing down observations onto field sheets) is through the use of user-friendly entry forms pre-designed in the database.

2.4 CONDUCT ITERATIVE DISCUSSIONS

CCT staff has reviewed previous versions of this protocol document and through iterative discussions, Summit has identified additional modifications to the database design, and revisions to these protocols.

2.5 DEVELOP FINAL PROTOCOL DOCUMENT AND DATABASE DESIGN

Summit has prepared this protocol document and completed design modifications to the original database design. Summit will continue to provide ongoing support for future translations and for developing queries to analyse data stored in the fully-functional OBMEP database.

3.0 DATABASE DESIGN

The database design was developed in Microsoft Access (MS Access) 2003 version. The database design can be saved in earlier versions; however some of the features may not function properly in the earlier versions. MS Access databases are particularly flexible as the component database tables can be easily exported to other database applications, such as Microsoft Excel (.xls file) and Borland Paradox (.dbf file). In addition, MS Access is widely used and is often the software of choice for beginner and intermediate database users. Many of the database software systems that are designed to handle enormous quantities of data (e.g., Oracle) use MS Access as the user-interface software. Furthermore, in using MS Access, all information can be managed from a single database file (i.e., .mdb file).

The database is a relational database (i.e., the database consists of several tables that are linked together to facilitate retrieval of data in a wide variety of ways). The main advantage of a relational database is that queries, reports, and forms can be created to display information from several tables at once.

4.0 HABITAT DATA PROTOCOL

The habitat component of the database has been assembled using six separate data types (prefix ptbl), and the design is based on relationships linking each of the tables to the MASTER SAMPLE table and various lookup tables (prefix lkp). The six data types are as follows:

1. Canopy;
2. Channel;
3. Human Influence;
4. Large Wood;
5. Riparian; and
6. Substrate.

A preliminary form has been created that provides a useful tool to get comfortable with the design and how these data behave in the relational database. To open this form, under Objects (on the left-hand side of the Database window), click Forms and double click on the “HABITAT DATA FORM”.

The following instructions outline the basic steps required to translate data from the Trimble unit output (hints and extra notes are provided in the text boxes for additional help):

Hint: To query the database for the last date already incorporated in the database, Double Click on the query “CCTqry_Recent HABITAT data download by date”.

4.1 GETTING STARTED

1. Export Trimble data in pathfinder office as a sample Microsoft Access .mdb set up file. Save this and then export data to a new Microsoft Excel worksheet.
2. Insert a new column at the beginning of the worksheet and count the records consecutively starting from one greater than the last SAMPLEID in the MASTER SAMPLE table in the database. Name the header of this column “SAMPLEID”.

Note: This SAMPLEID is specific to each record and is how the database links itself to the other data types. It is critical that this column be retained and remains relational when splitting up the data.

3. Open the HIGHLIGHTING workbook (Excel file), Select the entire color coded “highlighting” worksheet and then click the Format Painter button  on the Standard toolbar. Then click on the entire Trimble worksheet. This will highlight the Trimble worksheet with the same colors as the TEMPLATE.

Hint: If you don't see the Standard toolbar, on the View menu, point to Toolbars, and then click Standard.

4. Hold down the Ctrl Key and select the individual **blue** Columns by clicking with the mouse on the header of each column. Then Copy, and Paste these columns into 7 separate worksheets from your original worksheet that was formatted by the painter (MASTER SAMPLE, CANOPY, RIPARIAN, LGWOOD, HUMAN, CHANNEL, SUBSTRATE). Look at example worksheets (see HIGHLIGHTED TEMPLATES.xls) and copy appropriate colors into appropriate worksheets from your data. For example, MASTER SAMPLE should be **blue** and **yellow**; CANOPY is **blue** and **green**, etc.).

Hint: To Copy, and Paste, click Edit – Copy to copy the information, and then click to where you want to paste the information and click Edit – Paste.

4.2 TRANSLATION

The next step is what we term “Translation” of data. This is the process of re-arranging vertical spreadsheets to relational horizontal database tables. The following steps will walk you through how to translate data from each worksheet into the applicable database tables. Examples for each data type are provided in individual workbooks in the TEMPLATES directory. Open the applicable example (template) when translating data for quick reference. Copy each of the highlighted worksheets individually and paste into a new worksheet in a new workbook. Once you have pasted the highlighted worksheet into the workbook, you can remove the highlighting if you find it confusing.

Note: Save each workbook (file) as a new file to keep yourself organized. Organization is very important during this process so that steps can be followed or traced back if data questions or problems arise.

4.2.1 Master Sample

1. Copy the first row from the TEMPLATE worksheet in the MASTER SAMPLE file (workbook) and paste into your MASTER SAMPLE worksheet.
2. The field CREW will need to be split into CREWMEMBER1, CREWMEMBER2, etc. Use just the initials for each CREWMEMBER (as listed in the lkp_CREW in the database).

Note: To copy just the data (and not the headers), select the rows by selecting and dragging the mouse down the rows you would like to select (e.g., 2 through 12).

3. Fill in the DATA_COLLECTED field with Yes or No and the BIOEVENT field with the word HABITAT.
4. The TRANSECT_HAB data that we want to store in the database are the “Transect A” format. If any of the entries have an “X”, need to enter “SIDE” into the CHANN_SIDE field and change these data to reflect the appropriate transect (without the “X” designation). For all other records enter CHANNEL into the CHANN_SIDE field.
5. Format the DATE_START field by selecting the column, then click Format – Cells. Under the Number tab, choose Date and select the 7th option on the pull-down list (14-Mar-98).
6. Format the TIME_START field by selecting the column, then click Format – Cells. The database is formatted to store time data in the 24 hour clock, so then click Format – Cells. Under the Number tab, choose Time and select the 4th option on the pull-down list (13:30:55).

4.2.2 Canopy

The 6 green columns (vertically displayed data) will become two horizontal columns (TRANSDIR and DENSIOMETER). The procedure is detailed in the following steps (you can follow examples of these steps in the CANOPY template: TRANSLATE1, TRANSLATE2, etc.):

1. Insert a column before each DENS column.
2. Copy and Paste the formulas from the CANOPY template into each new column. Make sure the formulas line up with the last SAMPLEID. The formulas are “=cell in the adjacent column to the right” in the header row, and then “=cell above in the same column” for the rest of the column where data exist in the adjacent column. Examples of these formulas are highlighted in orange and yellow. Each column should have an orange cell header and each row that has data should have a corresponding yellow cell.
3. Select the entire worksheet, then Copy and Paste Special as Values (see hint below) to convert the formulas to values.

Hint: To Paste as Values, click Edit – Copy, then click Edit – Paste Special and choose Values. Remember to keep the entire worksheet highlighted for both the Copy and Paste as Values.

Note: The reason for the Paste as Values step is to change the cells from a formula to an actual value.

4. Cut (i.e., move) each set of DENS columns (newly created column and DENS data column) and Paste underneath the first set.

Hint: An easy way to select data in an Excel spreadsheet is to use the key pad. By holding the Shift key, while using the arrow keys you can select multiple cells one by one. By holding both the Ctrl key and the Shift key you can select a group of cells that contain data. The Shift key will automatically select to where there is a break in data. Therefore:

1. Click on the DENS header for the second set;
2. Hold the Shift Key and arrow over to the column just before the DENS header for the third set;
3. While continuing to hold the Shift key, also hold the Ctrl key and press arrow down to select entire set;
4. Now Cut this selection (Edit-Cut or Ctrl X);
5. Press Ctrl-Home to arrive at cell A1;
6. Press Ctrl-down (↓) to arrive at the end of the data in that column;
7. Press the down arrow once more to arrive at the next empty row underneath the data;
8. Now Paste data (Edit-Paste or Ctrl P).
9. Repeat for sets 2 through 9

5. Copy and Paste the SAMPLEID and TRANSECT_HAB columns so that they repeat themselves for each set. Delete the repeated headers, so that the headers are only in the first row.

6. Copy the first row from TEMPLATE worksheet in the CANOPY template and paste copied cells into the first row of your CANOPY worksheet.

4.2.3 Riparian

The first 20 columns are either Right Bank or Left Bank (contain the following fields: CP_VEG, CP_BIGTREE, CP_SMTREE, US_VEG, US_WOOD, US_NONWOOD, GC_WOOD, GC_NONWOOD, GC_LWD, and GC_BARE). The first 10 columns in the Trimble data are Right Bank and the next 10 are Left Bank.

1. Insert one column just after the HAB TRANSECT _ data.
2. Cut and Paste these data from LB columns underneath the RB columns. Fill the cells in the new column accordingly with either LB or RB. I have highlighted this column in **yellow**.
3. Copy and Paste the SAMPLEID and TRANSECT_HAB columns so that they repeat themselves for both sets. Delete the repeated headers and any empty cells, so that the headers are only in the first row.
4. Copy the first row from the TEMPLATE worksheet in the RIPARIAN file (workbook) and paste into your RIPARIAN worksheet.

4.2.4 Large Wood

Copy the header from the TEMPLATE worksheet in the LARGE WOOD workbook and paste copied cells into the first row of your LARGE WOOD worksheet.

4.2.5 Human Influence

The procedure for these data is nearly the same as the RIPARIAN, except there are 26 columns (contains the following fields: HU_WALL, HU_BLDG, HU_RIVACC, HU_PVMT, HU_PIPE, HU_TRASH, HU_CLEAR, HU_CROP, HU_PSTR, HU_LOG, HU_MINACT, HU_DIVERT, UNSTABB, and COMMENTS). The first 13 columns are LB and the next 13 are RB. It is important to note that with the HUMAN INFLUENCE data are reverse from the RIPARIAN (i.e., the LB is the first set and the RB is the last set). Also, there are no data for Transect K, so you can delete this row before translating.

1. Insert one column just after the HAB_ TRANSECT data.
2. Cut and Paste these data from RB columns underneath the LB columns. Fill the cells in the new column accordingly with either RB or LB. I have highlighted this column in **yellow**.
3. Copy and Paste the SAMPLEID and TRANSECT_HAB columns so that they repeat themselves for both sets. Delete the repeated headers and any empty rows, so that the headers are only in the first row. Then copy the header from the TEMPLATE worksheet in the HUMAN INFLUENCE workbook and insert the copied cells into the first row of your HUMAN INFLUENCE worksheet.
4. Combine the COMMENTS1 and COMMENTS2 fields (located at far right hand side of Trimble data (Columns AC and AD)).

4.2.6 Channel

Many fields require translation (similar to the CANOPY data but a bit more complex). These 78 vertically displayed columns will be translated into six (6) horizontal columns (GRADIENT, BAR_WIDTH, THAL_DEPTH, HAB_TYPE, FINES, SCHAN, BACW, and COMMENT). As above, you can follow examples of the translating steps in the numbered worksheets in the TEMPLATE workbook:

1. Copy columns D through CE and Paste into a new worksheet. Then insert a column just before the BAR_WIDTH header for each set (1 through 9) and before the WET_WIDTH(0). I have highlighted this column in maroon. Add the header STA_NUM for each of the inserted columns and add the appropriate STA_NUM (1 through 9) for all entries down the column.
2. Cut (i.e., move) each set of columns (starting at the second set) and Paste underneath the first set. See the hint above for an easy way to select data in an Excel worksheet using the key pad.
3. Make sure the headers match (the headers are mostly in the same order for each set except for sets 0 and 5 have WETTED_WIDTH, BANKFULL_WIDTH, BANKFULL_HEIGHT, and GRADIENT (slope). I have highlighted sets 0 and 5 in **aqua**. Data for sets 1 through 4 and 6 through 9 needs to be moved to the right to match the headers. To do this select data in columns B through E, click Insert – Cells, and choose Shift cells right. The set 5 data need to be switched (move the WETTED WIDTH, etc. from columns H to L and Insert into Column B).

Hint: To check that you have done this correctly, select the first row of the dataset and Choose Data – Filter – Auto Filter. Then by clicking on the pull-down list for each column, you will get a unique list of data in that column. Particular attention should be given to Column G, the BAR_WIDTH column. The items in the pull-down list should be limited to numbers and BAR_WIDTH headers.

4. Insert the **blue** columns from the CHANNEL sheet (SAMPLEID, TRANSECT_HAB) into the left side of these data (Insert Columns) and match up. In the example, there are no channel data for Transect K, so delete this entry.
5. Copy and Paste data from these **blue** columns so that they repeat themselves for each dataset. Delete the repeated headers, so that the headers are only in the first row.
6. Copy the first row from the TEMPLATE worksheet in the CHANNEL workbook and paste into the first row of your CHANNEL worksheet.
7. For the fields that have blank cells for sets 0-4 and 6-9, Find and Replace <blank> with -999. Finally, scroll through the comment field and enter any applicable information into the Cascade/Falls fields (CA_FA_HT, CA_FA_LN, and CA_FA_GRAD).

4.2.7 Substrate

This dataset is a lot like the CHANNEL and CANOPY data in that several fields require translation. The 30 vertically displayed columns will be translated into six (6) horizontal columns (STANUM, POSITION, DEPTH, SIZECLASS, EMBED_PCT, and COMMENT). As above, you can follow examples of the translating steps in the numbered worksheets in the TEMPLATE workbook:

1. Insert a column just before the DEPTH header for each set (i.e., Column D, Column H, etc). Then, as with the CANOPY data, Copy and Paste the formulas from the TEMPLATE workbook into each new column. Make sure the formulas line up with the last SAMPLEID. The formulas are “=cell in the adjacent column to the right” in the header row, and then “=cell above in the same column” for the rest of the column where data exist in the adjacent column. Examples of these formulas are highlighted in **orange** and **yellow**. Each column should have an **orange** cell header and each row that has data should have a corresponding **yellow** cell.
2. Select the entire worksheet, then Copy and Paste as Values to convert the formulas to values.

Hint: To Paste as Values, click Edit – Copy, then click Edit – Paste Special and choose Values. Remember to keep the entire worksheet highlighted for both the Copy and Paste as Values.

Note: The reason for the Paste as Values step is to change the cells from a formula to an actual value.

3. Cut (i.e., move) each set of columns (starting at the second set) and Paste underneath the first set. See the hint above for an easy way to select data in an Excel worksheet using the key pad.
4. Copy and Paste the SAMPLEID and TRANSECT_HAB columns so that they repeat themselves for each set. Delete the repeated headers, so that the headers are only in the first row.
5. Insert one column next to the descriptor column (Column D) and Copy and Paste these data so that there are duplicates.
6. In the first Column (Column D), Find and Replace (Replace All) “*_” with <nothing> and then run again finding “(m)*” and also replacing (Replace All) with <nothing>. In the second column (Column E), Find and Replace (Replace All) “DEPTH*” with <nothing>, and then run again finding “F” and also replacing with <nothing>.

Hint: The most efficient way to complete the Find and Replace is to select the column and click Edit – Find, then press the Options button and Choose “Match entire cell contents”. Then you can Find and Replace. Use Replace All.

7. Copy the first row from the TEMPLATE worksheet in the SUBSTRATE workbook and paste into the first row of your SUBSTRATE worksheet.
8. Find and Replace (Replace All) the following:
 - a. POSITIONS field, as follows: Position on transect. L= Left bankfull stage; LC=left of center; C=center; RC=right of center; R=right bankfull stage.

4.3 IMPORTING THE WORKSHEETS INTO THE DATABASE

The next step is to import each of the translated files into the database. The TEMPLATES use the same field names of the database, Microsoft Access will automatically recognize the fields. If the TEMPLATES are not used, you will need to make the field relationships

explicit when appending. The following procedure details how to import the translated files into the database, using the TEMPLATES as described above:

Note: Make sure all of the Headers in your seven worksheets are the same as the headers in the example workbooks

1. Open the database in Microsoft Access.
2. Click File – Get External Data – Import and browse to the file that contains the translated data you wish to append to the database.

Hint: The browse “import” window defaults to Files of Type “Microsoft Office Access”. To change to Excel files, click the pull-down list beside Files of Type and select “Microsoft Excel”.

3. The Import Spreadsheet Wizard will prompt you to do the following:
 - a. Select a worksheet - choose the worksheet that has the final translation (with the TEMPLATE headers). Click Next.
 - b. Tick the First Row Contains Column Headings checkbox. You will likely get the popup box that says: “The first row contains some data that can not be used for valid Access field names. In these cases, the wizard will automatically assign valid field names”. Click OK, and then Click Next.
 - c. Choose the In a New Table selection. Click Next.
 - d. Click Next again.
 - e. Choose the No Primary Key selection. Click Next.
 - f. Rename the file as the data type and add the date/time and person translating if you like. It is very important to remain organized here. Click Finish.
 - g. The popup box saying Finished importing file, click OK.
4. Repeat the above step (Step #3a-g) until all 7 files (MASTER SAMPLE, CANOPY, CHANNEL, HUMAN, LGWOOD, RIPARIAN and SUBSTRATE) are imported into the database.
5. The next step is to append these tables to the appropriate database tables. Use the following procedure to create the queries to accomplish this step:
 - a. Under Objects (on the left-hand side of the Database window), click Queries.
 - b. Click New (top of the Database window).
 - c. In the New Query window select Design View, then OK.
 - d. In the Show Table window, select the table you want to append to the database, and then click Add). Then press the Close button in the Show Table window.
 - e. Add all of the appropriately named fields (i.e., SAMPLEID, TRANSECT_HAB, etc and not the Field1, Field2) to the design grid. To do

this, drag the field from the field list to a column in the design grid, or double-click the field name in the field list (to remove a field from the design grid, click the column selector to highlight the column, and then press the Delete key).

- f. View the results of the query by clicking the Run button (exclamation mark icon) on the toolbar, or select Datasheet View from the View menu.
- g. Make the query an **Append Query** by clicking Query – Append Query, then in the Append window, select the database table you want to add your data to (i.e., if you are adding RIPARIAN data, choose the tbl_HAB_RIPARIAN table. Where the fields match, the program will automatically select the fields to append to.

Note: All of the fields should match if you have used the template headers appropriately and if you have selected the right tables to append from and append to.

6. Once you have confirmed that the append query will occur correctly, click the Run button (exclamation mark icon) on the toolbar and these data will append to the existing records.

5.0 FISH PASSAGE DATA PROTOCOL

5.1 DOWNLOADING DATA INTO EXCEL

Data are downloaded from the *Columbia River DART (Data Access in Real Time)* data for Adult Salmonid Passage at Wells (data since 1977). The following procedure details how to download these data into Microsoft Excel:

1. Via the internet, navigate to the following website:
<http://www.cbr.washington.edu/dart/adult.html>
2. From the pull-down list, select WEL-Wells [1977] and the year you wish to download. Click Begin Run.

Hint: To query the database for the last date already incorporated in the database, Double Click on the query “CCTqry_Recent FISH PASSAGE data downloaded by date”.

3. In the window that opens data (still in Microsoft Internet Explorer), Click File – Save As (or Page – Save As) to save a copy of the file for your records (save as a txt file). Name the file something useful (for example *DART WELLS 2006.txt*).
4. Copy the headers and data table and paste into an empty Excel worksheet. Do not include the summary data at the bottom of the table.
5. Select the Column A of the worksheet and Click Data – Text to Columns.
6. Convert Text to Columns Wizard.
 - a. Step 1 of 3: Select Fixed Width, click Next.
 - b. Step 2 of 3: Move the column separators to properly encase data in individual columns, click Next.
 - c. Step 3 of 3: Select the Mo/Da/Year column and under Column Data Format, Select “Date” and choose MDY from the pull-down list, and click Finish.
7. Select the entire worksheet and Find and Replace comma (“,”) with <nothing>. Click Replace All.

5.2 TRANSLATION

5.2.1 Master Sample

1. Delete the columns with the 10yr average data (Columns E, G, I, L, and N). Therefore, should only keep the following columns: Proj; Mo/Da/Year; ChRun; Chin; JChin; Sthd; SthdW; Sock; Coho; JCoho; Bull Tr; Lmpry; TempC. Also delete

- the second row (has “-----“ in each cell). Your worksheet should look like the template worksheet named “comma delimited”.
2. Insert a new column at the beginning of the worksheet and count the records consecutively starting from one greater than the last SAMPLEID in the MASTER SAMPLE table in the database. Name the header of this column “SAMPLEID”. Your worksheet should look like the template worksheet MS-TRANSLATE2.
 3. Copy and Paste the SAMPLEID, Proj, Mo/Da/Yr, ChRun and TempC columns into a new worksheet. Your worksheet should look like the template worksheet MS-TRANSLATE3. Name this worksheet MASTER SAMPLE to keep yourself organized. Copy the first row from the MASTERSAMPLE TEMPLATE worksheet in the FISH PASSAGE TEMPLATE workbook and paste copied cells into the first row of your MASTER SAMPLE worksheet.
 4. In this worksheet, select the SITEID column and Find and Replace WEL with WELLS.
 5. Format the DATE_START field by selecting the column, then click Format – Cells. Under the Number tab, choose Date and select the 7th option on the pull-down list (14-Mar-98).
 6. In the RUN column, Find and Replace (Replace All) “Su” with SUMMER. Then run two more times finding “Sp” and replace (Replace All) with SPRING, and finding “Fa” and replace with FALL.

Hint: The most efficient way to complete the Find and Replace is to select the column and click Edit – Find, then press the Options button and Choose “Match entire cell contents”. Then you can Find and Replace. Use Replace All.

5.2.2 Fish Passage

As with the Habitat Data, the next step is translation. The 10 fish species columns (vertically displayed data) will become two horizontal columns (SPECIES and COUNT). The procedure is detailed in the following steps (you can follow examples of these steps in the TEMPLATE workbook: TRANSLATE1, TRANSLATE2, etc.):

1. Copy the “comma delimited” sheet into a new worksheet. Name this worksheet FISH PASSAGE to keep yourself organized. Then insert a column before each SPECIES column (starting with Chin) and delete the temperature column. The first three columns contain the “MASTER SAMPLE information” (Proj, Mo/Da/Yr, and ChRun).

2. Copy and Paste the formulas from the FISH PASSAGE TEMPLATE.xls workbook (TRANSLATE2 worksheet) into each new column. Make sure the formulas line up with the last SAMPLEID. The formulas are “=cell in the adjacent column to the right” in the header row, and then “=cell above in the same column” for the rest of the column where data exist in the adjacent column. Examples of these formulas are highlighted in orange and yellow. Each column should have an orange cell header and each row that has data should have a corresponding yellow cell. Your worksheet should look like the template worksheet FP-TRANSLATE2.
3. Select the entire worksheet, then Copy and Paste Special as Values (see hint below) to convert the formulas to values.

Hint: To Paste as Values, click Edit – Copy, then click Edit – Paste Special and choose Values. Remember to keep the entire worksheet highlighted for both the Copy and Paste as Values.

4. Cut (i.e., move) each set of SPECIES columns (newly created column and COUNT data column) and Paste underneath the first set. Rename Column E to SPECIES and Column F to COUNT. Your worksheet should look like the template worksheet FP-TRANSLATE4.

Hint: An easy way to select data in an Excel spreadsheet is to use the key pad. By holding the Shift key, while using the arrow keys you can select multiple cells one by one. By holding both the Ctrl key and the Shift key you can select a group of cells that contain data. The Shift key will automatically select to where there is a break in data. Therefore:

1. Click on the SPECIES header (e.g., Chin, JChin) for the second set;
2. Hold the Shift Key and arrow over to the column just before the next SPECIES header for the third set;
3. While continuing to hold the Shift key, also hold the Ctrl key and press arrow down to select entire set;
4. Now Cut this selection (Edit-Cut or Ctrl X);
5. Press Ctrl-Home to arrive at cell A1;
6. Press Ctrl-down (↓) to arrive at the end of the data in that column;
7. Press the down arrow once more to arrive at the next empty row underneath the data;
8. Now Paste data (Edit-Paste or Ctrl P).
9. Repeat for sets 2 through 10.

5. Then Copy and Paste the SAMPLEID, Proj, Mo/Day/Year, and CHRUn data so that they repeat themselves for each set. This data is highlighted as yellow/green/red in the FP-TRANSLATE5 worksheet for further clarification. Delete the repeated headers that may have been copied for each set. The headers

should only exist in the first row. Your worksheet should look like the template worksheet FP-TRANSLATE5.

6. Copy the first row from FISH PASSAGE TEMPLATE worksheet in the FISH PASSAGE TEMPLATE workbook and paste copied cells into the first row of your FISH PASSAGE worksheet. Note there are two extra columns, LIFESTAGE and WILD_HATCH (see next step).
7. Add a data filter on the first row (i.e., the headers).

Hint: To add a data filter, select the row you want to filter. Click Data – Filter – Auto Filter. This adds pull-down lists for each header in the row. To show all data, Select “(All)” from the pull-down list.

- a. Filter for “JChin” and Add JUVENILE in the LIFESTAGE field for each record. Do the same for “JCoho”.
- b. Filter for “Chin” and Add ADULT in the LIFESTAGE field for each record. Do the same for “Coho”.
- c. Filter for “Sthd” and Add HATCHERY in the WILD_HATCH field for each record. Filter for “SthdW” and Add WILD in the WILD HATCH field.
- d. In the SPECIES column, Find and Replace (Replace All) for the following names:
 1. Chin – Chinook.
 2. JChin – Chinook.
 3. SthdW – Steelhead.
 4. Sthd – Steelhead.
 5. Sock – Sockeye.
 6. JCoho – Coho.
 7. Bull Tr – Trout Bull.
 8. Lmpy – Lamprey.

5.3 IMPORTING THE WORKSHEETS INTO THE DATABASE

Follow the same steps as outlined in Section 4.3.

6.0 DOE WATER QUALITY DATA PROTOCOL

Data are downloaded from the **Department of Ecology River and Stream Flow Monitoring in the Water Resource Inventory Area (WRIA) 49, Okanogan**. The OBMEP database retains data for the three “long-term stations” located in WRIA 49, as follows:

1. 49A070 – Okanogan R @ Malott;
2. 49A190 – Okanogan R @ Oroville; and
3. 49B070 – Similkameen R @ Oroville.

In addition to these “long-term stations”, the OBMEP database also retains data from shorter term stations in the Okanogan River, such as:

4. 49A090 – Okanogan River @ Okanogan;
5. 49A110 – Okanogan River @ Omak; and
6. 49A130 – Okanogan River @ Riverside.

6.1 DOWNLOADING DATA

The following procedure details how to download these data into Microsoft Excel:

1. Via the internet, navigate to the following website:
<http://www.ecy.wa.gov/apps/watersheds/riv/station.asp?theyear=&tab=notes&scrollly=0&wria=49&sta=first>.
2. Click on the station of interest.
3. Click on the “finalized data” tab to display data from the most recent year available.
4. There are two ways to download the data, as follows:
 - a. Simplest option – horizontal format. This is the simplest option for incorporating into the database because it is downloaded in database (vertical) format. However, you are downloading the entire dataset and will need to filter out the recent data only, for the 3 stations of interest.
 - i. At the bottom of the page, click on the “[All project data for WRIA 49](#)” link.
 - ii. Click “Save to File” in the File Download window.
 - iii. Browse to an appropriate location to save the file, Click Save, Then Close.

Hint: To query the database for the last date already incorporated in the database, Double Click on the query “CCTqry_Recent WQ data downloaded by date”.

Hint: To add a data filter, select the row you want to filter. Click Data – Filter – Auto Filter. This adds pull-down lists for each header in the row. To show all data, Select “(All)” from the pull-down list.

- b. Vertical (crosstab) format. This option only retrieves the year of interest (so you don’t need to filter out the data), but it is downloaded in crosstab format. Data in this format requires translation (re-arranging the vertical spreadsheet to relational horizontal database tables) before it can be incorporated into the database.
 - i. Under the “conventional parameters” data, Click on the “save the above table to file” button.
 - ii. Click “Save to File” in the File Download window.
 - iii. Browse to an appropriate location to save the file, Click Save, Then Close.
 - iv. Repeat steps 4 through 6 for the “metals” data.

6.2 TRANSLATION

6.2.1 Converting the Downloaded Data into Excel Format

The following steps only pertain to data downloaded in horizontal format (see Section 6.1 above, Option 4a.). If you decide to download the data in vertical form (Option 4b.), you will need to translate the data by following steps similar to the fish passage translation (Section 5.2.2). The specific details for this translation are not included in this document.

1. Open the downloaded “49.zip” file by double clicking through Windows Explorer.
2. If you are using the Evaluation Version of Winzip, Unzip the file by selecting “Use Evaluation Version”. Then click the Extract button, choose an appropriate location to store the extracted file and click Extract. If you have other unzipping software, follow the step-by-step prompts to extract the file. The extracted file is automatically named “49.txt”.
3. Open Microsoft Excel (Start – All Programs – Microsoft Excel or double click the icon on your desktop).
4. Click File – Open.

5. Using the “Files of type” pull-down list in the Open window, Select “All Files (*.*)”.
6. Navigate to the 49.txt file, Select and Click Open.
7. The Text Import Wizard will automatically appear:
 - a. Step 1 of 3 – Choose Delimited, Click Next.
 - b. Step 2 of 3 – Check Tab, Click Next.
 - c. Step 3 of 3 – Select each field and Select General under Column Data Format, except for the “Date” field, choose Date M/D/Y. Click Finish.
8. Click File – Save As. In the Save As window, select Microsoft Excel 5.0/95 Workbook from the Save As Type pull-down list, browse to an appropriate location and click Save. Name the file something useful (for example 49A070_2007.xls).

Note: A window will pop up that says, “...xls may contain features that are not compatible with Microsoft Excel 5.0/95 Workbook. Do you want to keep the workbook in this format? Click Yes.

6.2.2 Filtering Data in Excel

1. Add a data filter on the first row (i.e., the headers).

Hint: To add a data filter, select the row you want to filter. Click Data – Filter – Auto Filter. This adds pull-down lists for each header in the row. To show all data, Select “(All)” from the pull-down list.

2. In the “date” column, Click the pull-down arrow (dates will be automatically sorted chronologically). Decide which date is the beginning of these data you would like to incorporate (for example 1/3/2005).

Hint: To query the database for the last date already incorporated in the database, Double Click on the query “CCTqry_Recent WQ data downloaded by date”.

3. Choose (Custom...) in the pull-down list and in the Custom AutoFilter window, choose “is greater than or equal to” in the pull-down list and type in the beginning date (e.g., 1/3/2005).
4. Once filtered, a good check of the stations is to Click the pull-down arrow of the station column and a unique list will appear. You should only see a list of the desired stations. If there are stations you do not wish to incorporate, filter and delete.

5. Keeping the filter on, Select the entire workbook and Click Edit – Copy.
6. Open a new worksheet and Click Edit – Paste. Rename the worksheet to WATER QUALITY CHEMISTRY.

6.2.3 Customizing Data to Match the Database Design

1. Format the date by selecting the column, then click Format – Cells. Under the Number tab, choose Date and select the 7th option on the pull-down list (14-Mar-98).
2. In the parameter column, Find and Replace (Replace All) “FC” with FECAL_COL. Then finding “TURB” and replace (Replace All) with TURBIDITY.
3. As with the previous protocols, these data must be split into two tables, MASTER SAMPLE and WQ CHEMISTRY (see TEMPLATES in the DOE WQ TEMPLATE).
 - a. Master Sample
 - i. Select the First three columns (station, date and time) and Copy into a new worksheet.
 - ii. Click Data – Filter – Advanced Filter.
 - iii. In the Advanced Filter window, under Action, Choose “Copy to another location”.
 - iv. In the same window, click the right hand selector in the “Copy to” box and select a cell in the first row of the worksheet (beside the existing data, for example Column E).
 - v. Check the “Unique records only” checkbox.
 - vi. Click OK.
 - vii. Delete the first four columns of this worksheet so that only the unique records show.
 - viii. Insert a new column at the beginning of the worksheet and count the records consecutively starting from one greater than the last SAMPLEID in the MASTER SAMPLE table in the database. Name the header of this column “SAMPLEID”.
 - ix. Enter two new headers, BIOEVENT and AGENCY after the last column and enter WATER QUALITY and DOE, respectively in these columns for each record.
 - x. Copy the first row from MASTER SAMPLE template in the DOE WQ TEMPLATE workbook and paste copied cells into the first row of your active worksheet.
 - b. Water Quality Chemistry - Copy the first row from WQ CHEMISTRY template in the DOE WQ TEMPLATE workbook and paste copied cells into the first row of your active worksheet.

6.3 IMPORTING THE WORKSHEETS INTO THE DATABASE

Follow the same steps as outlined in Section 4.3. It is important to remember with chemistry results, often analyses are performed in different ways. For example, less than detection limit results are sometimes treated as zeros, sometimes as the real value and sometimes as half the detection limit. A new field (termed VALUE_CALC) will be created prior to analyses to ensure data are treated appropriately. It is not efficient to update this field as you import data, rather to update as part of the database audit conducted prior to analyses.

7.0 DOE HOURLY TEMPERATURE DATA PROTOCOL

As with the DOE Water Quality (Section 6.0), a portion of the DOE hourly temperature data are also downloaded from the **Department of Ecology River and Stream Flow Monitoring in the Water Resource Inventory Area (WRIA) 49, Okanogan**. In particular, this website contains hourly temperature data for the same three “long-term stations” located in WRIA 49, as follows:

- 49A070 – Okanogan R @ Malott (July 27, 2005 to September 30, 2005);
- 49A190 – Okanogan R @ Oroville (June 6, 2001 to September 20, 2005); and
- 49B070 – Similkameen R @ Oroville (June 6, 2001 to August 31, 2003).

In addition to these sites, DOE has also provided Microsoft Excel files for three additional stations, as follows:

- 49F070 – Bonaparte Creek (September 9, 2002 to January 10, 2006);
- 49C100 – Omak Creek (September 24, 2003 to January 11, 2006); and
- 49E080 – Tunk Creek (August 29, 2002 to January 11, 2006).

This file also contains data for station 49B070 – Similkameen River (continued from download above, September 24, 2003 to January 10, 2006).

The following procedure relates to data available from the website only. It is also important to note that temperature data are not stored in relational tables (i.e., ptbl_Master_Sample and a temp table). This is because temperature data contain one value for each station, day and time hourly). Temperature data are stored in one “side” table, named atbl_HOURLYTEMP (note prefix change to atbl).

7.1 DOWNLOADING DATA

The following procedure details how to download data for the three “long-term stations” into Microsoft Excel:

1. Via the internet, navigate to the following website:
<http://www.ecy.wa.gov/apps/watersheds/riv/station.asp?theyear=&tab=notes&scrollly=0&wria=49&sta=first>.
2. Click on the station of interest.
3. Click on the “temperature” tab to display data from the most recent year available.

Hint: To query the database for the last date already incorporated in the database, Double Click on the query “CCTqry_Recent TEMP data downloaded by date”.

4. At the bottom of the data, Click on the link, *Data in tabbed-delimited text file (all years)*: [tmp49A070.zip](#) (note the last six characters is the specific station name).
5. Click Save in the File Download window.
6. Browse to an appropriate location to save the file, Click Save, Then Close.

7.2 TRANSLATION

7.2.1 Converting Downloaded Data into Excel Format

The following steps only pertain to data available on the website. Incorporation of additional Microsoft Excel files provided by DOE will follow a similar protocol, but the specific details are not included in this document.

1. Open the downloaded “tmp49A070.zip” file by double clicking through Windows Explorer.
2. If you are using the Evaluation Version of Winzip, Unzip the file by selecting “Use Evaluation Version”. Then click the Extract button, choose an appropriate location to store the extracted file and click Extract. If you have other unzipping software, follow the step-by-step prompts to extract the file. The extracted file is automatically named “tmp49A070.txt”.
3. Through review of these files, it is apparent that the values in the txt is slightly disjointed (i.e., the records do not match up perfectly). The best way to fix this is to perform a Delete – Shift Cells Up in Microsoft Excel. Open Microsoft Excel (Start – All Programs – Microsoft Excel or double click the icon on your desktop, if available).
 - a. Click File – Open.
 - b. Using the “Files of type” pull-down list in the Open window, Select “All Files (*.*)”.

- c. Navigate to each station tmp#####.txt file, Select and Click Open.
- d. The Text Import Wizard will automatically appear:
 - i. Step 1 of 3 – Choose Fixed Width, Click Next.
 - ii. Step 2 of 3 – You may need to add a break line at this step. Scroll through the dataset at this step to locate the best spot for a break line. Click Next.
 - iii. Step 3 of 3 – Select Each field and Select General under Column Data Format, except for the “Date” field, choose Date Y/M/D. Click Finish.
- e. As mentioned above, the data may be disjointed and will have extra blank cells where data needs to be manually shifted to match it up correctly. Note that blank cells do not necessarily mean that the data is mismatched (may indicate “no data”, but if the data is mismatched in your table, the easiest way to find where the data starts being mismatched is to filter and review where blank cells occur. To filter the data, follow these steps:
 - i. Select the first row of the dataset (contain the headers), Choose Data – Filter – Auto Filter.
 - ii. In each column, Click the pull-down list and select “(Blanks)”. If there are blanks, follow the procedure in Step f. If there are not any blanks, skip Step f and continue with the protocol.
- f. This procedure will shift blank cells to correct mismatched data (if applicable)
 - i. In the Trip column, Click the pull-down arrow and select “(Blanks)”.
 - ii. Select the Trip, Station, Date and Time cells for all filtered records (all blanks for the rows highlighted in blue – denoting the filter) and Click Edit – “Go To...”.
 - iii. When the Go To window appears, Click on the “Special...” button.
 - iv. Select the “Visible cells only” option.
 - v. Click Edit –Delete – Shift Cells Up.

Hint: To show all data, Select “(All)” from the pull-down list.

4. These data include all records available for all years. As the historical records already exist in the database, filter out only the records for your desired dates (for example, the most recent year):
 - a. Select the first row of the dataset (contains the headers), Choose Data – Filter – Auto Filter.
 - b. In the “date” column, Click the pull-down arrow (dates will be automatically sorted chronologically). Decide which date is the beginning of these data you would like to incorporate (for example 1/3/2005).
 - c. Choose (Custom...) in the pull-down list and in the Custom AutoFilter window, choose “is greater than or equal to” in the pull-down list and type in the beginning date (e.g., 1/3/2005).
 - d. Keeping the filter on, Select the entire workbook and Click Edit – Copy.
 - e. Open a new worksheet and Click Edit – Paste.

Hint: To query the database for the last date already incorporated in the database, Double Click on the query “CCTqry_Recent TEMP data downloaded by date”.

5. Repeat the above steps for each desired station (i.e., 49A190 and 49B070). Stack each dataset into one file and complete the next steps on all three stations at the same time.
6. Click File – Save As. In the Save As window, select Microsoft Excel 5.0/95 Workbook from the Save As Type pull-down list, browse to an appropriate location and click Save. Name the file something useful (for example *49A070_2007.xls*).

Note: A window will pop up that says, “...xls may contain features that are not compatible with Microsoft Excel 5.0/95 Workbook. Do you want to keep the workbook in this format? Click Yes.

7.2.2 Customizing Data to Match the Database Design

You can follow examples of these steps in the DOE TEMP TEMPLATE workbook: TRANSLATE1, TRANSLATE2, etc.):

1. Copy the first row from TEMPLATE in the DOE TEMP TEMPLATE workbook and paste copied cells into the first row of your active worksheet.
2. Format the date by selecting the column, then click Format – Cells. Under the Number tab, choose Date and select the 7th option on the pull-down list (14-Mar-98).
3. Format the TIME_START field by selecting the column, then click Format – Cells. The database is formatted to store time data in the 24 hour clock, so then click Format – Cells. Under the Number tab, choose Time and select the 4th option on the pull-down list (13:30:55).
4. Enter DOE into the AGENCY column for each record.
5. Add “DOE-“ to each SITE_ID so that it matches with the lkp_SITES table. Find “49A070” and Replace All “DOE-49A070”. Do the same for 49A190 and 49B070.

7.3 IMPORTING THE WORKSHEETS INTO THE DATABASE

Follow the same steps as outlined in Section 4.3.

8.0 EUREKA WATER QUALITY DATA PROTOCOL

The CCT collects the following water quality parameters for 35 stations:

- Temperature;
- Specific Conductivity;
- Dissolved Oxygen (mg/L and %);
- pH;
- Turbidity; and
- Salinity.

The following procedure outlines the steps to translate the data from the csv (Comma delimited) file into the database.

Hint: To query the database for the last date already incorporated in the database, Double Click on the query “CCTqry_Recent WQ data downloaded by date”.

8.1 DOWNLOADING DATA INTO EXCEL

1. Open Microsoft Excel (Start – All Programs – Microsoft Excel or double click the icon on your desktop).
2. Click File – Open.
3. Using the “Files of type” pull-down list in the Open window, Select “All Files (*.*)”.
4. Navigate to the csv file, Select and Click Open.
5. Click File – Save As. In the Save As window, select Microsoft Excel 5.0/95 Workbook from the Save As Type pull-down list, browse to an appropriate location and click Save. Name the file something useful (for example *OBMEP-551_Jan2007.xls*).

Note: A window will pop up that says, “...xls may contain features that are not compatible with Microsoft Excel 5.0/95 Workbook. Do you want to keep the workbook in this format? Click Yes.

8.2 TRANSLATION

8.2.1 Master Sample

1. The first two columns contain the “MASTER SAMPLE information (DATE, and TIME). Insert a new column at the beginning of the worksheet and count the records consecutively starting from one greater than the last SAMPLEID in the MASTER SAMPLE table in the database. Name the header of this column “SAMPLEID”.
2. Copy and Paste the SAMPLEID, DATE and TIME columns into a separate worksheet. Name this worksheet MASTER SAMPLE to keep yourself organized. Copy the first row from the MASTER SAMPLE TEMPLATE worksheet in the EUREKA WQ workbook and insert the copied cells into the first row of your MASTER SAMPLE worksheet.
3. In this worksheet, Enter the appropriate SITEID into all records (use lkp_SITES to identify the appropriate SITEID, for example “OBMEP-###”)

8.2.2 Water Quality

As with the Fish Passage Data (Section 5.0), the next step is translation. The 11 parameter columns (vertically displayed data) will become four horizontal columns (DATE, TIME, PARAMETER and CONC). The procedure is detailed in the following steps (you can follow examples of these steps in the EUREKA WQ TEMPLATE workbook: TRANSLATE1, TRANSLATE2, etc.):

1. Copy the original worksheet into a new worksheet and name the worksheet WQ CHEM to keep yourself organized. Delete the last two columns (Bat V V and Circulator). Then insert a column before each parameter column (Temperature, Sp. Cond, DO mg/L, pH, Turbid, Salinity, and DO). The first two columns contain the “MASTER SAMPLE” information (DATE, and TIME) and therefore you do not need to insert a column before these columns.
2. Copy and Paste the formulas (entire column) from the EUREKA EQ TEMPLATE.xls workbook (TRANSLATE2 worksheet) into each new column. Make sure the formulas line up with the last SAMPLEID. The formulas are “=<cell in the adjacent column to the right>” in the header row, and then “=cell above in the same column” for the rest of the column where data exist in the adjacent column. Examples of these formulas are highlighted in orange and yellow. Each column should have an orange cell header and each row that has data should have a corresponding yellow cell.
3. Select the entire worksheet, then Copy and Paste Special as Values (see hint below) to convert the formulas to values.

Hint: To Paste as Values, click Edit – Copy, then click Edit – Paste Special and choose Values. Remember to keep the entire worksheet highlighted for both the Copy and Paste as Values.

Note: The reason for the Paste as Values step is to change the cells from a formula to an actual value.

4. Cut (i.e., move) each set of parameter (e.g., temperature, DO, pH, etc.) columns (newly created column and CONC data column) and Paste underneath the first set. Compare the TRANSLATE3 and TRANSLATE4 worksheets to get an idea of what this step means.

Hint: An easy way to select data in an Excel spreadsheet is to use the key pad. By holding the Shift key, while using the arrow keys you can select multiple cells one by one. By holding both the Ctrl key and the Shift key you can select a group of cells that contain data. The Shift key will automatically select to where there is a break in data. Therefore:

1. Click on the parameter header (e.g., temp, DO, pH) for the second set;
2. Hold the Shift Key and arrow over to the concentration column for the third set;
3. While continuing to hold the Shift key, also hold the Ctrl key and press arrow down to select entire set;
4. Now Cut this selection (Edit-Cut or Ctrl X);
5. Press Ctrl-Home to arrive at cell A1;
6. Press Ctrl-down to arrive at the end of the data in that column;
7. Press the down arrow once more to arrive at the next empty row underneath the data;
8. Now Paste data (Edit-Paste or Ctrl P).
9. Repeat for sets 2 through 10.

5. Copy and Paste the SAMPLEID column so that it repeats itself for each set. Delete the repeated headers, so that the headers are only in the first row.
6. Copy the first row from WQ CHEM TEMPLATE worksheet in the EUREKA WQ TEMPLATE workbook and paste copied cells into your WQ CHEM worksheet into the first row.
7. In the parameter column (i.e., now termed CHEMCODE), Find and Replace (Replace All) for the following names (use lkp_CHEMDICT to identify the appropriate CHEMCODE, for example “TEMP”):
 - a. Temperature °C – TEMP.
 - b. Sp.Cond ms/cm – SP_COND.
 - c. DO mg/L - DO_MGL.

- d. pH – PH.
- e. Turbid NTU – TURBIDITY.
- f. Salinity PSS – SALINITY.
- g. DO % - DO_PERCENT.

Note: The easiest way to do this is to copy the original chemical name in the spreadsheet (e.g., Temperature °C), Then Click Edit-Find and in the “Find What:” box, Enter “Ctrl-V” (this is the key code for “paste”) and then in the “Replace With:” box, type the appropriate CHEMCODE (e.g., TEMP).

- 8. In the AGENCY column add CCT for all records.

8.3 IMPORTING THE WORKSHEETS INTO THE DATABASE

Follow the same steps as outlined in Section 4.3. It is important to remember with chemistry results, often analyses are performed in different ways. For example, less than detection limit results are sometimes treated as zeros, sometimes as the real value and sometimes as half the detection limit. A new field (termed VALUE_CALC) will be created prior to analyses to ensure data are treated appropriately. It is not efficient to update this field as you import data, rather to update as part of the database audit conducted prior to analyses.

9.0 BOXCAR HOURLY TEMPERATURE DATA PROTOCOL

Boxcar temperature data are collected by CCT staff. The CCT is currently redeveloping the design of how data are collected by temperature probes, however the probes using the old design will continue to collect data until the batteries die. As the batteries are replaced, the new design will be adopted. For purposes of this document, there are two protocols (Section 9.1), one for the old design and one for the new design (Section 9.2) and associated TEMPLATE workbooks.

Hint: To query the database for the last date already incorporated in the database, Double Click on the query “CCTqry_Recent TEMP data downloaded by date”.

9.1 OLD DESIGN

1. Open Microsoft Excel (Start – All Programs – Microsoft Excel or double click the icon on your desktop, if available).
 - a. Click File – Open.
 - b. Using the “Files of type” pull-down list in the Open window, Select “All Files (*.*)”.
 - c. Navigate to the data file (downloaded from the temperature probe, for example “360 Salmon Creek 2006.txt”, Select and Click Open.
 - d. The Text Import Wizard will automatically appear:
 - i. Step 1 of 3 – Choose Delimited, Click Next.
 - ii. Step 2 of 3 – Check Tab **and** Check Space, Click Next.
 - iii. Step 3 of 3 – Select the Date field and Select Date MDY Column Data Format; Select Time and Select Text; Select Temperature and Select General. Click Finish.
2. Click File – Save As. In the Save As window, select Microsoft Excel 5.0/95 Workbook from the Save As Type pull-down list, browse to an appropriate location and click Save. Name the file something useful (for example *360 Salmon Creek 2006.xls*).

Note: A window will pop up that says, “...xls may contain features that are not compatible with Microsoft Excel 5.0/95 Workbook. Do you want to keep the workbook in this format? Click Yes.

3. Copy the first row from TEMPLATE in the “BOXCAR TEMP TEMPLATE – OLD DESIGN” workbook and paste copied cells into your active worksheet (replacing the headers in the first row of your worksheet).

4. Format the date by selecting the column, then click Format – Cells. Under the Number tab, choose Date and select the 7th option on the pull-down list (14-Mar-98).
6. Format the TIME field by selecting the column, then click Format – Cells. The database is formatted to store time data in the 24 hour clock, so then click Format – Cells. Under the Number tab, choose Time and select the 4th option on the pull-down list (13:30:55).
7. Enter the appropriate SITEID into all records (use lkp_SITES to identify the appropriate SITEID, for example “OBMEP-360”)
8. Enter BOXCAR into the AGENCY column for each record.
9. Enter “BOXCAR DATA” into the SOURCE column for each record.

9.2 NEW DESIGN

9.2.1 Converting the Data into Excel Format

1. Export the desired file into Excel format using Hoboware software.
2. Open Microsoft Excel (Start – All Programs – Microsoft Excel or double click the icon on your desktop, if available).
 - a. Click File – Open.
 - b. Using the “Files of type” pull-down list in the Open window, Select “All Files (*.*)”.
 - c. Navigate to the data file (downloaded from the temperature probe, for example “1065639.csv”, Select and Click Open.
3. Click File – Save As. In the Save As window, select Microsoft Excel 5.0/95 Workbook from the Save As Type pull-down list, browse to an appropriate location and click Save. Name the file something useful (for example *360 Salmon Creek 2006.xls*).

Note: A window will pop up that says, “...xls may contain features that are not compatible with Microsoft Excel 5.0/95 Workbook. Do you want to keep the workbook in this format? Click Yes.

9.2.2 Customizing Data to Match the Database Design

You can follow examples of these steps in the “BOXCAR TEMP TEMPLATE – NEW DESIGN” workbook: TRANSLATE1, TRANSLATE2, etc.):

1. Delete the first row (contains the Plot Title: #####) and delete the first column (has consecutive #s). Delete the last four columns (Batt, V; Coupler Detached; Couple Attached; and End of File). Delete last row of data. Insert a column after Time, GMT-08:00.
2. Copy and Paste the data in the Time Column (Column A) into the adjacent blank Column (Column B). Expand the B column to show all the data, by dragging the column separator to the right.

Note: You do not need to format these columns separately for Date and Time. Access will automatically treat the data appropriately when this data is appended to the existing tables in the database,

3. Copy the first row from TEMPLATE in the “BOXCAR TEMP TEMPLATE – OLD DESIGN” workbook and paste copied cells into your active worksheet (replacing the existing headers in your active worksheet).
4. Enter the appropriate SITEID into all records (use lkp_SITES to identify the appropriate SITEID, for example “OBMEP-360”).
5. Enter BOXCAR into the AGENCY column for each record.
6. Enter “BOXCAR DATA” into the SOURCE column for each record.

9.3 IMPORTING THE WORKSHEETS INTO THE DATABASE

Follow the same steps as outlined in Section 4.3.

10.0 DOE FLOW DATA PROTOCOL

As with the DOE Water Quality (Section 6.0) and the hourly temperature data (Section 7.0), the flow data (this section) are also downloaded from the **Department of Ecology River and Stream Flow Monitoring in the Water Resource Inventory Area (WRIA) 49, Okanagan**. In particular, this website contains flow data (historical data include monthly, more recent data are collected daily) for thirteen stations located in WRIA 49. The OBMEP database captures eight of these stations.

Flow data are measured monthly or daily at the following four stations (see Section 10.1):

- 49B070 – Similkameen R @ Oroville;
- 49C100 – Omak Creek near St. Mary’s Mission;
- 49F070 – Bonaparte Creek @ Tonasket; and
- 49E080 – Tunk Creek near Riverside.

Flow data are measured irregularly and infrequently at the following four stations (see Section 10.2):

- 49D080 – Johnson Creek @ Riverside;
- 49G060 – Antoine Creek near mouth;
- 49H080 – Tonasket Creek near Oroville; and
- 49J060 – Ninemile Creek near Oroville.

The data downloaded from the website for each of these station groups is different and the protocols are addressed separately in this document (Section 10.1 – Frequently collected flow data, and Section 10.2 – Randomly collected flow data).

As above with the temperature data (Sections 7.0 and 9.0), flow data are also not stored in relational tables (i.e., ptbl_Master_Sample and a flow table). All flow data are stored in one “side” table, named atbl_FLOW.

10.1 FREQUENTLY COLLECTED FLOW DATA

10.1.1 Downloading Data into Excel

The following procedure details how to download data for the seven stations into Microsoft Excel:

1. Via the internet, navigate to the following website:
<https://fortress.wa.gov/ecy/wrx/wrx/flows/station.asp?wria=49>.
2. Click on the station of interest.
3. Scroll to the bottom of the page and click on the “mean daily table” link for the most recent water-year.

Hint: To query the database for the last date already incorporated in the database, Double Click on the query “CCTqry_Recent FLOW data download by date”.

4. In the window that opens data (still in Microsoft Internet Explorer), Click File – Save As (or Page – Save As) to save a copy of the file for your records (save as a txt file). Name the file something useful (for example *49B070_2006.txt*).
5. Close this window and Open the txt file in Microsoft Word.
6. In the txt file, Click Edit - Select All, then Click Edit – Replace... In the Find What window put “~” and in the Replace With window put “X” and Click Replace All. Note: the reason we do this step now is because Microsoft Excel does not recognize “~”. We will delete the “X” at a later step. It is important that the “X” is put it so that the data will line up correctly in the following steps.
7. If applicable, Find and Replace “?” with “X” as well.
8. Copy the headers and data table and paste into an empty Excel worksheet.
9. Select Column A for the entire dataset and Click Data – Text to Columns.
10. Convert Text to Columns Wizard.
 - a. Step 1 of 3: Select Fixed Width, click Next.
 - b. Step 2 of 3: Move the column separators to properly encase these data in individual columns, click Next.

Note: To delete a column separator, point the cursor to it and Double-click.

- c. Step 3 of 3: Click Finish.

11. Select rows 2 to 33 of the worksheet and Find and Replace each qualifier (“U”, “A”, “I”, “B”, “T”, “J”, “[“, “]”, and “X”) with <nothing>. Click Replace All. Qualifiers are not retained in the database.

10.1.2 Translation

As with the Eureka Water Quality Data (Section 8.0), the next step is translation. The 12 month columns (vertically displayed data) will become two horizontal columns (DATE and FLOW). The procedure is detailed in the following steps (you can follow examples of these steps in the TEMPLATE workbook: TRANSLATE1, TRANSLATE2, etc.):

1. Delete the second row (blank). Then insert a column before each month column. Delete the last column (Day) as this is a repeat of the first column.
2. Copy and Paste the formulas (entire column) from the DOE FLOW TEMPLATE.xls workbook (TRANSLATE2 worksheet) into each new column. Make sure the formulas line up with the last SAMPLEID. The formulas are “=cell in the adjacent column to the right” in the header row, and then “=cell above in the same column” for the rest of the column where data exist in the adjacent column. Examples of these formulas are highlighted in orange and yellow. Each column should have an orange cell header and each row that has data should have a corresponding yellow cell.
3. Select the entire worksheet, then Copy and Paste Special as Values (see hint below) to convert the formulas to values.

Hint: To Paste as Values, click Edit – Copy, then click Edit – Paste Special and choose Values. Remember to keep the entire worksheet highlighted for both the Copy and Paste as Values.

Note: The reason for the Paste as Values step is to change the cells from a formula to an actual value.

4. Cut (i.e., move) each set of MONTH and FLOW columns and Paste underneath the first set.
5. Copy and Paste the DAY column (for example 1 through 31) so that it repeats itself for each set. Delete the repeated headers, so that the headers are only in the first row.
6. Copy and Paste headers from TRANSLATE6 to your worksheet Row #1.

Hint: An easy way to select data in an Excel spreadsheet is to use the key pad. By holding the Shift key, while using the arrow keys you can select multiple cells one by one. By holding both the Ctrl key and the Shift key you can select a group of cells that contain data. The Shift key will automatically select to where there is a break in data. Therefore:

1. Click on the month header for the second set.
2. Hold the Shift Key and arrow over to the column just before the next month header for the third set.
3. While continuing to hold the Shift key, also hold the Ctrl key and press arrow down to select entire set.
4. Now Cut this selection (Edit-Cut or Ctrl X).
5. Press Ctrl-Home to arrive at cell A1.
6. Press Ctrl-down to arrive at the end of the data in that column.
7. Press the down arrow once more to arrive at the next empty row underneath the data.
8. Now Paste data (Edit-Paste or Ctrl P).
9. Repeat for sets 2 through 10.

7. Enter the year of these data (example '05 or '06) into the **orange** highlighted cells. Copy and Paste the formulas from the DATE column in the TRANSLATE6 worksheet (highlighted in **yellow**). This will format the date to fit the database design (e.g., 14-May-06). This is a *concatenate* function.
8. Select the DATE column, then Copy and Paste Special as Values (see hint above, after #3) to convert the formulas to values. Delete the cell containing the year.
9. Copy the first row from TEMPLATE worksheet into the first row of your data. Under AGENCY, enter DOE for each record. Under SITEID, enter the station number that corresponds with SITEIDs in the lkp_SITES table (e.g., DOE-49B070).
10. Filter the FLOW column for blanks and delete these records.

Hint: To add a data filter, select the row you want to filter. Click Data – Filter – Auto Filter. This adds pull-down lists for each header in the row. To show all data, Select “(All)” from the pull-down list.

10.2 RANDOMLY COLLECTED FLOW DATA

10.2.1 Downloading Data into Excel

The following procedure details how to download data for the seven stations into Microsoft Excel:

1. Via the internet, navigate to the following website:
<https://fortress.wa.gov/ecy/wrx/wrx/flows/station.asp?wria=49>.
2. Click on the station of interest.
3. Scroll to the bottom of the page and click on the “mean daily table” link for the most recent water-year.

Hint: To query the database for the last date already incorporated in the database, Double Click on the query “CCTqry_Recent FLOW data download by date”.

4. In the window that opens data (still in Microsoft Internet Explorer), Click File – Save As (or Page – Save As) to save a copy of the file for your records (save as a txt file). Name the file something useful (for example *49B070_2006.txt*).
5. Close this window and Open the txt file in Microsoft Word.
6. Copy only the headers and data table and paste into an empty Excel worksheet.
7. Select Column A for the entire dataset and Click Data – Text to Columns.
8. Convert Text to Columns Wizard.
 - d. Step 1 of 3: Select Fixed Width, click Next.
 - e. Step 2 of 3: Move the column separators to properly encase these data in individual columns, click Next.
 - f. Step 3 of 3: Click Finish.

10.2.2 Translation

1. Delete row 2
2. Cut date data in Column A and paste under the header in column D
3. Cut time data in column B and paste under the header in column E
4. Select the date column(column D) and right click-format cells and select the 7th option (14-Mar-01)

5. Copy the first row from TEMPLATE worksheet and paste copied cells into the first row of your data (replacing the existing headers in your active worksheet). Under AGENCY, enter DOE for each record. Under SITEID, enter the station number that corresponds with SITEIDs in the lkp_SITES table (e.g., DOE-49B070).

10.3 IMPORTING THE WORKSHEETS INTO THE DATABASE

Follow the same steps as outlined in Section 4.3.

11.0 USGS TEMPERATURE AND FLOW DATA PROTOCOL

The temperature and flow data are downloaded from the **USGS National Water Information System** website. The website contains data for **1,486,615 sites**. The OBMEP database retains data for three stations, as follows:

- USGS-12439500;
- USGS-12445000; and
- USGS-12447200.

Historical water chemistry data are available for these three stations and has been incorporated into the OBMEP database. Since these data are not continually collected, a protocol for incorporation is not required. If collection and water quality testing for these stations starts again in the future, a protocol for incorporation should be developed.

11.1 DOWNLOADING DATA INTO EXCEL

The following procedure details how to download these data into Microsoft Excel:

1. Via the internet, navigate to the following website:
<http://nwis.waterdata.usgs.gov/nwis/uv?12439500>.

Note: The above website contains data for station USGS-12439500. Therefore, to navigate to the other two stations, use the following websites, respectively:

<http://nwis.waterdata.usgs.gov/nwis/uv?12445000>; and
<http://nwis.waterdata.usgs.gov/nwis/uv?124347200>.

2. In the box “Available data for this site”, choose “Time series: Real time data”.
3. Scroll down the page until you see the heading:
Additional Data and Information.--Station [data inventory](#) and [annual data report](#)., Click [data inventory](#).
4. In the “AVAILABLE DATA” box Click Time Series: Daily Data.
5. Scroll down the page until you see the table with the following headings, “Available Parameters; Period of Record; Output format; and Begin date and End date”.
6. Under Available Parameters, there are five choices with check boxes beside them. Put check marks in the discharge and temperature boxes. If additional boxes are checked, click on the check mark to uncheck them.

7. In the Output Format section of the box, Select the tab-separated option.
8. Add the desired dates in Date start and Date end (day after the last date in the OBMEP database to today's date). The Period of Record shows the dates that each data type is available.

Hint: To query the database for the last date already incorporated in the database, Double Click on the queries "CCTqry_Recent TEMP data downloaded by date" and "CCTqry_Recent FLOW data downloaded by date".

9. Click GO.
10. In the window that opens that data (still in Microsoft Internet Explorer), Click File – Save As (or Page – Save As) to save a copy of the file for your records (save as a txt file). Name the file something useful (for example *1243950.txt*).
11. Close this window and open each of the txt files.
12. Copy the headers and data table from each text file and Paste into an empty Excel worksheet (one worksheet for each station).
13. Delete the second row (contains 5s, 15s, 16s, 14s)
14. The desired data for the database are in columns A (agency), B (station), C (date), D (flow), and J (mean daily temp). Delete the unnecessary columns.
15. Combine the desired data from all three stations into one worksheet and translate all together.

11.2 TRANSLATION

Because temp and flow data are separate from the relational components of the database, the translation is quite simple. The dataset will be split into two tables, atbl_HOURLYTEMPS and atbl_FLOW. The procedure is detailed in the following steps (an example is provided in the USGS FLOW TEMP TEMPLATE workbook):

1. Columns A, B, C and D make up the atbl_FLOW table. Copy these 4 columns into an empty worksheet and copy the first row from FLOW TEMPLATE worksheet into the first row of your data.

2. Columns A, B, C and E make up the atbl_HOURLYTEMPS table. Copy these 4 columns into an empty worksheet and copy the first row from TEMP TEMPLATE worksheet into the first row of your data.
3. For both worksheets, Find and Replace All in the SITEID field, 12439500 with USGS-12439500; 12445000 with USGS-12445000; and 12447200 with USGS-12447200.

11.3 IMPORTING THE WORKSHEETS INTO THE DATABASE

Follow the same steps as outlined in Section 4.3.

12.0 ENVIRONMENT CANADA FLOW AND TEMPERATURE DATA PROTOCOL

Flow data are downloaded from the **Environment Canada Water Survey Real-Time Hydrometric Data** website. The OBMEP database currently retains data for only one station, OKANAGAN RIVER NEAR OLIVER (08NM085). However, new data are currently being collected for additional stations in Vaseux Creek, Inkaneep Creek and Shuttleworth Creek. Temperature data will also be available on this website in the future and downloading and translation will follow a similar protocol as outlined below.

12.1 DOWNLOADING DATA INTO EXCEL

The following procedure details how to download these data into Microsoft Excel:

1. Via the internet, navigate to the following website:
<http://scitech.pyr.ec.gc.ca/waterweb/SelectProvince.asp?lang=0>
2. Under “Please select a province”, Select British Columbia and Click GO.
3. Using the mouse, select the station on the map that you want to download.
4. In the Data Category window, Select HISTORIC and Click GO.

Hint: To query the database for the last date already incorporated in the database, Double Click on the query “CCTqry_Recent FLOW data download by date”.

5. Scroll down to the Archived Hydrometric Data Report:
 - a. In the Report Type window, select DAILY.
 - b. In the Report Output Type, select DATE-DATA FORMAT (CSV).
 - c. Click Obtain Report.
6. Click [Click here to download the file.](#) Click Open.
7. A window will open the dataset (looks like an Excel worksheet but is still in Windows Explorer)
8. Click File – Save As. In the Save As window, select Microsoft Excel 5.0/95 Workbook from the Save As Type pull-down list, browse to an appropriate location and click Save. Name the file something useful (for example *08NM085 - 2007.xls*).

Note: A window will pop up that says, "...xls may contain features that are not compatible with Microsoft Excel 5.0/95 Workbook. Do you want to keep the workbook in this format? Click Yes.

9. Close this window and open the .xls file.

12.2 TRANSLATION

1. The values are stored as cubic meters per second and need to be converted to cubic feet per second for consistency in the database. To convert these values, multiply each value by 35.31. Use the Formula in Column F "=[cell]*35.31 and drag down for the entire dataset.

Note: This conversion was adopted from *Hydrologic Units & Conversions*
<http://www.srh.noaa.gov/wgrfc/convert.html>.

2. Select the entire worksheet, then Copy and Paste Special as Values (see hint below) to convert the formulas to values.

Hint: To Paste as Values, click Edit – Copy, then click Edit – Paste Special and choose Values. Remember to keep the entire worksheet highlighted for both the Copy and Paste as Values.

3. Delete the second row (empty).
4. Copy the first row from TEMPLATE worksheet into the first row of your data. Under AGENCY, enter ENVIRONMENT CANADA for each record (Paste over the existing headers).
5. Format the DATE field by selecting the column, then click Format – Cells. Under the Number tab, choose Date and select the 7th option on the pull-down list (14-Mar-98).

12.3 IMPORTING THE WORKSHEETS INTO THE DATABASE

Follow the same steps as outlined in Section 4.3.

13.0 REDD SURVEY DATA PROTOCOL AND ENTRY FORM

The redd survey data are collected by CCT staff in trimble units. The following sections provide two ways to incorporate the data into the database, either by following the protocol for translation once downloaded into excel (Section 13.1), or by entering using the electronic entry form in the database (Section 13.2).

Hint: To query the database for the last date already incorporated in the database, Double Click on the query “CCTqry_Recent REDD data downloaded by date”.

13.1 PROTOCOL

The following procedure outlines the steps to translate the data from the Microsoft Excel (xls) file into the database.

1. Export Trimble data in pathfinder office as OBMEP shapefile (.dbf). Save this file and then export data to a new Microsoft Excel worksheet. Name this file something useful (for example, creek and date of survey).
2. Open Microsoft Excel (Start – All Programs – Microsoft Excel or double click the icon on your desktop, if available).
3. Click File – Open.
4. Navigate to the data file (downloaded from the Trimble Unit, for example “Redd_Sur.xls”, Select and Click Open.
5. Copy the entire worksheet into two duplicate separate worksheets. Name one MASTER SAMPLE and name the other REDD.

13.1.1 Master Sample

The following procedure pertains to the worksheet you just created called MASTER SAMPLE.

1. Insert two columns at the beginning of the file.
2. Copy the first row from the MASTER SAMPLE TEMPLATE and paste copied cells into the first row of your active worksheet (replacing the headers in the first row of your worksheet).

3. Enter the appropriate SITEID into all records (use lkp_SITES to identify the appropriate SITEID, for example “OBMEP-###”)
4. Copy and Paste the columns with the headers into a new worksheet. In the example TEMPLATE workbook (TRANSLATE1 MASTERSAMPLE worksheet) these columns are highlighted in green).
5. Filter the dataset for the unique records. To do this, use the following procedure:
 - a. Select all columns and Click Data – Filter – Advanced Filter.
 - b. In the Advanced Filter window, under Action, Choose “Copy to another location”.
 - c. In the same window, click the right hand selector in the “Copy to” box and select a cell in the same worksheet that is below the data (for example, cell A20).
 - d. Check the “Unique records only” checkbox.
 - e. Click OK.
6. Copy and Paste the unique records (and headers) into a new worksheet. You may have to manually delete repeated records. For example, in the sample data provided in the TEMPLATE, the two bottom records have the same MASTER SAMPLE data as the top record. In this case, the final worksheet should only have one record.
7. Name this worksheet MASTER SAMPLE UNIQUE to keep yourself organized. This is the worksheet that will be imported into the database in Section 13.1.3.
8. In the SAMPLEID column, count the unique records consecutively starting from one greater than the last SAMPLEID in the MASTER SAMPLE table in the database.
9. In the BIOEVENT column, enter REDD into all records.

13.1.2 Redd

The following procedure pertains to the REDD worksheet only (created above).

1. Insert one column at the beginning of the file.
2. Copy the first row from the REDD TEMPLATE and paste copied cells into the first row of your active worksheet (replacing the headers in the first row of your worksheet).

3. Copy and Paste the columns with the headers into a new worksheet. In the example TEMPLATE workbook (TRANSLATE1 REDD worksheet) these columns are highlighted in pink.
4. In the SAMPLEID column, enter the appropriate SAMPLEID (as per the MASTER SAMPLE TABLE). For example, in the sample data provided in the template the three records will all have a SAMPLEID of 1.
5. Scan the data for missing entries and fill in as appropriate. For example, in the sample data provided in the template the flag color was only entered for the first records. All three records should have had “red” entered as well.

13.1.3 Importing the Worksheets into the Database

Follow the same steps as outlined in Section 4.3.

13.2 ENTRY FORM

As mentioned above, another option to enter data is to use the electronic entry forms in the database. To open the pre-designed entry forms, Under Objects (on the left-hand side of the Database window), click Forms. The names of the pre-designed form will be displayed in the Database window. Each of these entry forms has the prefix “ENTRYFORM” for sorting purposes.

Double click on the entry form of interest (ENTRYFORM REDDDATA). A box will appear asking for the Data Type. For the Redd data, enter REDD. Once in the form, you can press the Tab key to scroll through the fields. The field descriptor appears in the bottom left hand corner of the screen.

To scroll through the records, click the arrow keys at the bottom of the form. To enter a new record, click the arrow key with the asterisk and a new blank record will open. Database users must be forewarned that all changes to the database are permanent and cannot be reversed (e.g., deleting a record, updating information in a cell, etc.). Because of this, care must be taken when working with the data directly in the entry forms.

Here is an example of the entry form for the Redd Survey Data:

Microsoft Access - [ptb_MASTER_SAMPLE]

File Edit View Insert Format Records Tools Window Help

Type a question for help

MS Sans Serif 8 B I U

SITEID: OKANRT1

SAMPLEID (Autonumber): 16095

BIOEVENT: REDD

CREWMEMBER1: JA DATE (dd-mm-yy): 21-Feb-07 WEATHER: Partly Cloudy

CREWMEMBER2: KK WATERTEMP (C): 15 COMMENTS:

CREWMEMBER3: TE VIS_DIST_START (m): 3

CREWMEMBER4: VIS_DIST_END (m): 2

CREWMEMBER5:

SubEntryForm REDD DATA

	FLAGCOLOR:	FLAGNO:	NO_REDDS:	AD_PRES:	AD_NOTP:	AD_UNK:	MAX_DEPTH:	DIR:	DIST:	LAT_DD:	LONG_DD:
▶	RED	1	2	0	0	0	3	N	25	48.40582382	-119.500306487
	RED	2	3	1	0	2	0	E	30	48.405799935	-119.500305582
	RED	3	5	0	2	0	3	W	15	48.40577902	-119.500306196
*		0	0	0	0	0	0		0	0	0

Record: 1 of 1

Biological Sampling Event ID

NUM

14.0 SNORKEL DATA ENTRY FORM

See the text in Section 13.2 (Redd Data) for instructions on how to use the entry forms.

Hint: To query the database for the last date already incorporated in the database, Double Click on the query “CCTqry_Recent REDD data downloaded by date”.

Here is an example of the entry form (ENTRYFORM SNORKELDATA) for the Snorkel Data (for the Data Type, enter SNORKEL):

Microsoft Access - [ENTRYFORM SNORKELDATA : Form]

File Edit View Insert Format Records Tools Window Help

Tahoma

SITE_ID: 08MEP-360 DATE (dd-mm-yy): 13-Oct-06

AVG_WIDTH: 5.57 START_TIME (24 hr): 10:50 WATER_TEMP_START (F): 44

END_TIME (24 hr): 12:08 WATER_TEMP_END (F): 44

VIS_DIST (in feet): 5.57

VIS_QUAL (Poor; Fair; Good; Unknown): GOOD

COMMENTS: Very cold water likely counts are biased low

SAMPLEID (Autonumber): 201

BIOEVENT: SNORKEL

WEATHER: Sunny

CREWMEMBER1: JA

CREWMEMBER2: TE

CREWMEMBER3:

CREWMEMBER4:

CREWMEMBERS:

TRANSECT	SPECIES	SIZE_CLASS	NUM_FISH
C-D	Rainbow	100-300mm	3
C-D	Rainbow	<100mm	2
E-F	Rainbow	>300mm	1
E-F	Rainbow	100-300mm	1
F-G	Rainbow	<100mm	1
G-H	Rainbow	100-300mm	8
G-H	Rainbow	>300mm	1
G-H	Trout Brook	100-300mm	22
G-H	Trout Brook	>300mm	6
H-I	Trout Brook	100-300mm	2
H-I	Rainbow	100-300mm	1
I-J	Trout Brook	<100mm	1
I-J	Rainbow	100-300mm	2
J-K	Rainbow	100-300mm	1
G-H	Cottid Unknown	<100mm	1

Add New Record

Record: 2 of 101

Site ID as provided by 01_SITE. '08MEP-' plus 3-digit Site Number.

NUM

15.0 TRAP DATA ENTRY FORM

See the text in Section 13.2 (Redd Data) for instructions on how to use the entry forms. Here is an example of the entry form (ENTRYFORM TRAPDATA) for the Trap Data (for the Data Type, enter TRAP):

The screenshot shows the Microsoft Access interface for the 'ENTRYFORM TRAPDATA : Form'. The form contains the following fields and sections:

- Form Fields:**
 - SITENAME: Dkanogan River
 - Trap RPM: 8.5
 - TIME_START (24 hr): 0:30
 - DATE_START (dd-mmm-yy): 10-May-06
 - TIME_END (24 hr): 2:10
 - DATE_END (dd-mmm-yy): 10-May-06
 - CALCULATE JULIANDATE: 130
 - Trap Size: 8 FOOT
 - WEATHER: cold, clear and no wind
 - Fishing Position (1 or 2): 1
 - Redeploy Start Time (24 hr): 3:00
 - Redeploy RPM:
 - TRAP NOTES: Cleaned trap. Flow increased
 - BIOEVENT: TRAP
 - DATA COLLECTED?
 - CREWMEMBER1-5: EB, FJ, [blank], [blank], [blank]
 - SAMPLEID (Autonumber): 20
 - Add New Record button
- Salmonids Table:**

SPECIES:	LIFESTAGE:	COUNT:	MORTALITIES:	AD_CLIP:
▶ Chinook	SMOLT	23	0	Yes
Sockeye	JUVENILE	37	2	No
Steelhead	SMOLT	6	0	Yes
*		0	0	

SUM: 68

Open Form to Enter Individual Fish Data
- Non-Salmonids Table:**

SPECIES	COUNT	MORTALITIES
▶	0	0
- Number of Marked (i.e., dyed) and Recaptured Salmonids Table:**

SPECIES	TOTALNO_MARKED	TOTALNO_RECAP
▶ Steelhead		1
*		
- Footer:** Record: 19 of 185. SiteName (lkp_SITES, sorted by Traps). NUM

16.0 VIDEO DATA ENTRY FORM

See the text in Section 13.2 (Redd Data) for instructions on how to use the entry forms. Here is an example of the entry form for the Video Data (for the Data Type, enter VIDEO):

Microsoft Access - [ENTRYFORM VIDEODATA : Form]

File Edit View Insert Format Records Tools Window Help

Tahoma 8 B I U

SiteName: **OBMEP-ZOSEL** Date Started at the Site (dd-mmm-yy): Comments: SAMPLEID (Autonumber): 7
 Hard Drive No: 1 Date Removed from the Site (dd-mmm-yy): **BIOEVENT:VIDEO**

INDIVIDUAL FISH OBSERVANCES

Observance Date (dd-mmm-yy): 05-Oct-05 Primary Mark: Unmarked
 Time (hour; 0-23): 0 Secondary Mark:
 Camera No (2 digit): 3 Sex:
 Fish Species: Chinook QUANTITY: 1 Has this motion clip been archived?
 Direction Migrating: Notes: Camera 1 becomes Camera 3 on later

Reviewed By: QAQC By:
 Date Reviewed: Date QAQC:
 Enter Today's Date for QAQC

Timestamp: 10/5/2005 0

Use this Record Selector for Each Fish Observed During a Review Session:

MAINTENANCE (for each HD set in the field)

Enter Today's Date:
 Time (hour; 0-23):
 HardDr Motion % (.xx): 30.00%
 Timelapse Amount Free: 99349
 Motion Amount Free: 55058
 Notes:

% Motion Free: 73%
 % Time Lapse: 57%

Use this Record Selector for Daily Maintenance:
 Record: 1 of 1

Record: 1 of 21

STATUS (lists each date and camera for each site and harddrive)

Camera	Date Start	# MD Clips Reviewed	Visibility White; Near	Visibility Black; Near	Visibility White; Far	Visibility Black; Far	Video	LIGHT ON
▶ 3	05-Oct-05	488	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
3	06-Oct-05	10682	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
3	07-Oct-05	234	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
* 0			<input type="checkbox"/>					

Use this Record Selector for Each Video Review Session:
 Record: 7 of 33

Site (lkp_SITE) NUM

Web links: [Lake Osoyoos daily mean lake level](#) [Okanogan River at Oroville discharge and temperature data](#)

17.0 QUALITY ASSURANCE/QUALITY CONTROL

It is important to understand how data quality is maintained through standardized QA/QC procedures. Following importing into the database, all records and tables should be audited. This auditing process involves analyses of outliers (e.g., to identify potential inconsistencies with units) and completeness (e.g., to identify missing samples or missing data); and, checking sample identification numbers (e.g., to ensure that data were not duplicated).

In general, auditing the database includes the following analyses:

- Check all parent-to-child (one-to-many) relationships to ensure the relationships are working appropriately;
- Perform unique queries on all fields to identify outliers;
- Perform min-max queries on all fields to identify outliers; and
- Perform duplicate queries to check for duplicate entries.

Any suspicious values should be checked against original documentation. Any changes that are made manually as a result of the checking should be double-checked by a second auditor.

18.0 CREATING SIMPLE QUERIES

The following instructions outline the basic steps required to create a select query, in query Design View.

1. Under **Objects** (on the left-hand side of the Database window), click **Queries**.
2. Click **New** (top of the Database window).
3. In the **New Query** window select **Design View**, then **OK**.
4. Select data you want to work with by adding the tables or queries that contain data of interest (in the Show Table window, select tables and/or queries, then **Add**). Once you have added the tables you are interested in querying, press the **Close** button in the Show Table window.
5. The query is completed by filling in the design grid, as follows:
 - a. To add a field to the design grid, drag the field from the field list to a column in the design grid, or double-click the field name in the field list (to remove a field from the design grid, click the column selector to highlight the column, and then press the **Delete** key);
 - b. To sort records in the query results, click in the **Sort** cell for the field you want to sort, click the arrow, and then select a sort order from the pull-down list (e.g., ascending);
 - c. To limit the records that you see in the query's results, specify criteria in the **Criteria** row for one or more fields (e.g., to include only Kokanee enter “*Kokanee*”); and,
 - d. To perform calculations on the values in a field, click **Totals** on the toolbar (Sum icon; or select **Totals** from the **View** menu) to display the **Total** row in the design grid, click the arrow, and then select a function by using the pull-down list (e.g., sum, average, etc.).
6. View the results of the query by clicking the **Run** button (exclamation mark icon) on the toolbar, or select **Datasheet View** from the **View** menu.

For more information on queries refer to the MS Office Access Help under the **Help** menu.

19.0 GLOSSARY

Column	Horizontal column in a spreadsheet (e.g., A, B, C).
Component	The habitat data are a component of several database components that ultimately make up the OBMEP database design. Examples of other database components are the Snorkel data, the Trap data and the Video data.
Data type	The habitat data are split into 6 data types (CANOPY, CHANNEL, LGWOOD, RIPARIAN, SUBSTRATE, and HUMAN). The SAMPLEID for each data type links to the MASTER SAMPLE table.
Highlight	Color coding cells with data.
Row	Vertical row in a spreadsheet (e.g., 1, 2, 3).
Select	Selecting multiple cells using the mouse or keypad
Template	The template worksheets contain the headers as named in the OBMEP database, but are in the same columns as the Trimble output design. Using these templates will simplify importing data into the OBMEP database.
Translation	This is the process of re-arranging vertical spreadsheet to relational horizontal database tables.
Workbook	A Microsoft Excel file that contains multiple worksheets.
Worksheet	A single spreadsheet contained in a Microsoft Excel workbook.

APPENDIX A
Microsoft Excel Templates
(on CD)

APPENDIX B

Microsoft Access OBMEP Database

(on CD)