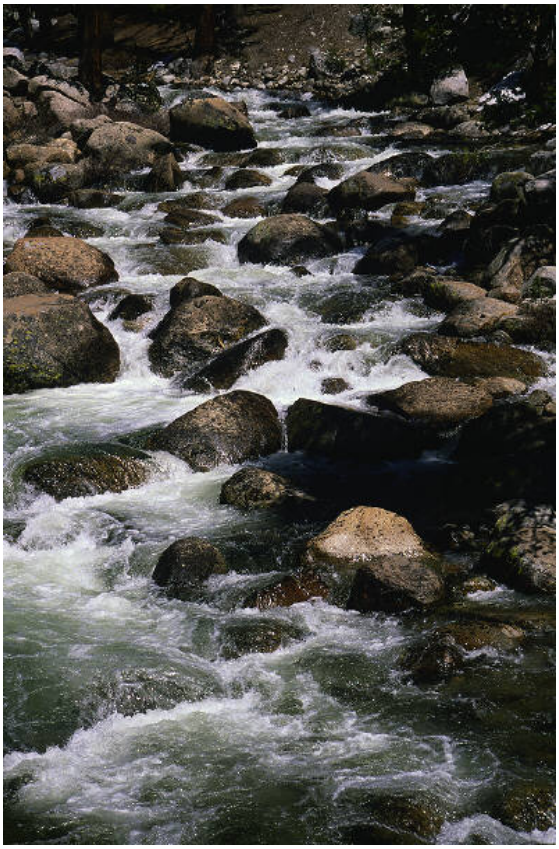
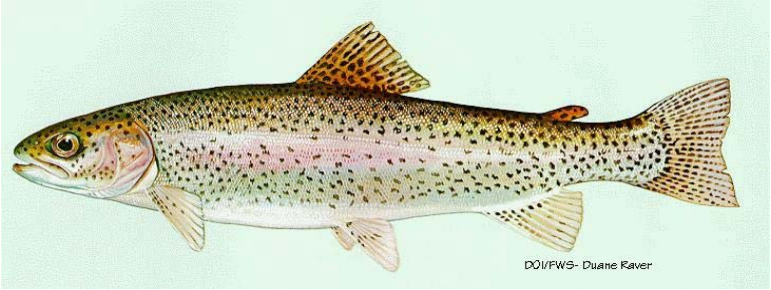
REGION 6
Stream Habitat Inventory
Quality Assurance/Quality Control
Manual





United States Department of Agriculture
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Pacific Northwest Region

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QUALITY CONTROL MANUAL
FOR THE STREAM INVENTORY PROGRAM

INTRODUCTION

In the Chief's "A Natural Resource Agenda for the 21st Century", he identified four key areas of focus, and the top priority was to maintain and restore the health of our ecosystems and watersheds. To address this focus, we need to be able to describe the existing condition of our aquatic resources. We do that in part through the Pacific Northwest Stream Inventory Program. We have a defined stream inventory protocol (Level 1 and 2) that has an associated corporate and national database (Natural Resources Information System, Aquatic Inventory, Aquatic Biota (NRIS AI/AB)). The program began in 1989, with about 15,000 miles of stream surveyed over the past 13 years. This significant investment of time and money has led to an evaluation of the quality of the program.

Quality control and assurance (QC/QA) is an important part of any data collection. The Region 6 Stream Inventory Program is no exception, but no formal QC/QA procedures had ever been outlined. Recent checking and subsequent clean up of the data in the region has brought to light some problems that justified the need for a Quality Control manual. Recent reductions in budgets and the high profile of our stream inventory data made quality assurance, program efficiency and organizational structure a priority for the Hydrology and Fisheries program managers.

The Stream Inventory Quality Control Manual is a technical document that outlines specific procedures to guide stream inventory quality control coordinators and surveyors at the Forest scale in collecting the most accurate data possible and entering it into the NRIS AI/AB database. The manual explains procedures that will establish consistency and standardization to ensure the quality of data collected and entered into the database will be high.

Quality assurance consists of several facets necessary for ensuring high quality data collection and entry. Each component must be completed to meet the goal of providing a high quality database.

Study results tell us that training crews is the most crucial aspect in creating quality data. Crews need to have proper preparation and knowledge of the protocol before they can conduct surveys. A key component after the initial basic training is the use of a "test reach", where surveyors hone their skills before conducting field inventories.

Good quality control in field data collection will lead to higher quality data for entry into the NRIS database. However, training and QA/QC are also required for data entry personnel so they know enough about the database and the protocol in order to detect and correct errors in data entry.

Stream Inventory Objective

Provides defensible, quantitative characterization of physical and biological aquatic habitat conditions at the reach and watershed scales to support a variety of planning, analysis, monitoring, and evaluation activities.

Regional Quality Control and Quality Assurance Program Objective

Provide oversight and guidance to Forest Stream Inventory Programs with the goal of collecting and maintaining high quality stream inventory data.

Centralization of Stream Habitat Inventory Programs

To ensure the goal of consistency and standardization across the Region, each National Forest or province area, will develop and implement a centralized program, with one person assigned responsibility for coordinating and implementation. (See Appendix A for Province descriptions). The duties for the stream inventory coordinator are to be:

- → Main contact for questions about procedures and protocols;
- → QA/QC contact and perform QA/QC checks on the surveyors throughout the season;
- → Responsible for ensuring that quality data is collected and entered into the database;
- → Typically responsible for hiring stream inventory crews or administering contract crews; and
- → In charge of Forest training, including a test reach.

Crew Supervision

- Crews can be at the Districts but must check in weekly with the coordinator.

Standardized Reporting

A stream inventory report format will be developed for the Forest or Province so consistent reports are produced by each unit. Minimum completeness for these reports includes an overview, summary, reach summaries, and a survey map (see Appendix B for an example report).

R6 STREAM INVENTORY QUALITY CONTROL MANUAL

PROPER TRAINING

Proper training of field crews is an essential component of a QA/QC program. Forests must provide proper training for surveyors and coordinators by sending crews annually to NR9 (R6 Stream Inventory Training) followed by training at the Forest. Follow-up training will include what was learned at NR9, with emphasis on local conditions through the use of test reaches. Emphasis should also be put on those items that were not covered during the NR9 training. The use of equipment specific to the Forest should also be covered.

- Surveyors must attend the R6 Stream Inventory Training Session (NR9).
- Surveyors need to receive proper follow-up training at the Forest from experienced personnel to ensure comprehension and proper application of the regional inventory. Follow-up training must incorporate all aspects of stream inventory training, which includes the following:
  - **Rosgen Delineation – Bankfull determination**

    Bankfull indicators and measurements are taught at NR9. This component needs follow-up at the Forest to familiarize surveyors with conditions in the area they will be surveying. A video is also available: *A Guide to Field Identification Bankfull Stage in the Western United States*. Consult the hydrologist at the Forest for a copy of this video or they will have the information on where to obtain a copy.

  - **Fish Identification and Sampling (electroshockers, etc.)**

    Additional training in fish identification is imperative for the individual locations because species differ by area. Training in the use and safety precautions of the electroshockers or other equipment used in identifying fish and capture is essential. The necessary precautions along with any permitting or consultation to be taken in streams with threatened and endangered species will also be covered at this time.

  - **Riparian Vegetation – Identifying indicator species**

    This training should be completed to cover vegetation types and collection methodologies for the local area.

- **Habitat Identification**

  Although this attribute is covered extensively in NR9, Forests need to emphasize definitions by providing oversight in a field setting with surveyors to ensure consistency. The optional habitat subtypes are not covered in NR9, and training is the Forest's responsibility.

- **Discharge Measurements – Use of Flow Meters**

  NR9 teaches the principle of discharge and demonstrates it in the field, but each Forest needs to train its surveyors how to use their particular flow meter. Training must also include procedures for taking discharge for discharge measurements and how to calculate flow.

- **Use and Deployment of Stream Temperature Monitors**

  If this is a task for the surveyors, then they must be trained in using and deploying the specific monitor being used. Temperature monitors must also be calibrated.

- **Wood Size Class Determination**

  - Although covered in NR9, follow-up training on the Forest is required. Emphasize taking actual tape measurements of woody material to calibrate the surveyors' eyes to conditions that will be encountered in the field.
  - Counting woody material should also be covered, especially wood counts in debris jams.
  - Assure that the surveyors are counting wood only in the bankfull channel and are also counting live trees that may have boles in the bankfull.

- **Remarks**

  - Note taking is a critical part of the inventory. Conditions that are not captured in data collection are recorded here. Good notes are important for writing quality stream survey reports. Some of the conditions that surveyors should note:

    - Unstable banks on nonmeasured units
    - Activities, such as grazing, timber sale, roads in riparian areas, rock quarries, recreational uses near the stream (trails, campgrounds)
    - Fish presence

- Plugged culverts
- Possible fish barriers
- Type of harvest methods, buffer size, Sequence Order (SO) where harvest unit begins and ends
- Debris jam locations, size and effect on stream dynamics, such as side channel formation
- Wildlife sightings
- Channel gradient, valley floor width, and valley slopes
- Existing instream structures
- Unusual items

- **Test Reach**

  - All crews must survey a test reach to evaluate their knowledge and readiness for fieldwork. For more detailed information on how to set up and run a test reach, see pg. 7.

- **Bank Stability**

  - This attribute is covered in NR9. It needs to be stressed that bank stability is recorded above bankfull, and it needs to be looked at in conjunction with the natural and manmade conditions for the area.

- **Any additional attributes collected by the Forest**

  - If a Forest chooses to collect optional attributes from the R6 protocol or they collect additional attributes not covered under the protocol, they must be taught at the Forest (Province).

PRE-SURVEY WORK (LEVEL I)

Pre-survey work consists of gathering as much information about the stream to be surveyed as possible, including map preparation (USGS, 1/24,000 scale map), aerial photos, and completing preliminary field forms. This work provides a base to start from, identifying safety hazards, access points, and difficult terrain before going to the field. It is also recommended to identify the Latitude Longitude Identifier (LLID) of your stream at this time in the NRIS Water AI/AB database. See instructions on how to do this in Appendix K.

- **Quality Control Starts with having the Right Tools Before Starting the Survey**

  Completion of the Survey Form and Preliminary Reach Forms is vital to having efficient and well-prepared crews. Items such as aerial photos and good field maps also promote safety for the crew. The following items and forms must be completed before surveying:

  - **Survey Form**
    - This form documents historical information for the stream to be surveyed to assist surveyors by providing a snapshot of conditions in the field.

  - **Preliminary Reach Form**
    - This form identifies preliminary stream reaches from topographic maps (USGS, 1/24,000 scale map) and aerial photos.
    - We recommend to mapwheel the river miles for field ready maps, and copy the maps onto write-in-the-rain paper.
    - Color copies of aerial photos that cover the stream and the adjoining road network.
    - Any reports from previous surveys.

☞ **Tip:** Sending out a Stream Information Request Form to the person that requested the stream survey will help you define important aspects when completing the Survey Form and Preliminary Reach Forms (see Appendix C for an example).

Pre-survey Checklist

- The checklist in Appendix D aids in preparing the stream folders.

TEST REACH PROCEDURE

This is a mandatory procedure consisting of a stream segment previously surveyed by an experienced team. Results of the test reach are evaluated against test reach data from experienced teams. Dependent on the evaluation, procedures are corrected and the test reach re-surveyed. Surveyors that meet minimum standards do not have to resurvey the test reach. The test reach results are a tool for QA/QC coordinators to determine if surveyors are ready to begin actual surveying. It will also show areas that may need improvement.

****A copy of the test reach results must be sent to the Regional QA/QC Coordinator each year. If a forest is contracting out the survey work the contractors must also be tested.*****

Setting up a Test Reach (QA/QC Coordinators)

1. Select a stream that is easily accessible. Length of stream segment should be at least ¼ mile.

2. The stream segment selected should consist of a variety of habitat units; try to include special features, culverts, and woody debris. It is recommended that at least 12 pieces of wood be in the test reach. This may not be possible in all locations.

3. An experienced team will survey the stream segment prior to use as a test reach, and accomplish the following:

    - Flag the beginning and the end of the test reach. Also flag the habitats where surveyors are to perform bankfull and floodprone measurements and the Wolman pebble count.
    - Each channel unit will be measured (length, average width, and maximum depth).
    - In-channel woody debris within the unit will be measured with a diameter tape if possible and recorded. Countable live woody debris will be estimated.
    - Bank instability, if present, will be measured at designated measured units.

Running the Test Reach (Stream Surveying Crews)

1. Be sure crews have been through proper training and are comfortable with the protocol (pg. 3-4. Proper Training). They should have spent time training in the field prior to the test reach exercise.

2. Assign crews as they will be paired for the summer stream survey season. Before starting the test reach, discuss the actions they will take before they enter the test

reach (as if they were doing an actual survey). Following are some of the items crews should have or refer to:

- Correct survey forms (Channel Unit Form, Special Cases Form, Remarks Form, Wolman Forms) and a sufficient number of copies for a days' work (on write-in-the-rain).
- Necessary equipment (a cheat sheet in the form of a checklist on the clipboard will help complete this task. See Appendix E for an example).
- Surveyors' calibrate eye (if estimating).
- Necessary field maps and aerial photos.
- Selecting random number for measured units (can be different for slow water units and fast water units).

3. Each crew can start in a different spot (they would cycle back to the beginning of the reach and end where they started) or the start times can be staggered but the entire test reach must be completed. Give plenty of distance between crews so that they have adequate time to survey at their own pace. As crews are surveying have them reference the handbook for answers to their questions. Make them work through the problem and address it after the test reach is completed.

4. The QA/QC Coordinator fills out the Test Reach checklist in Appendix F. These checklists help to highlight areas that need work and will also highlight areas where surveyors are doing a good job. Positive reinforcement is an important part of this process and can be conveyed verbally and through the comments section. **A copy of this checklist will be sent to the Regional QA/QC Coordinator.**

5. After the test reach is completed, go through any pressing questions. It may be good to walk through the test reach as a group to cover major questions that come up. Take the data and compare it to the master data that was collected. This is the time to address any major problems or errors in data collection, if any.

6. After running the data through analysis (see Appendix F) sit down with each crew and discuss ways to improve the data collection and possibly go back to the test reach for discussion. Successful completion of the test reach will mean that crews have completed the test reach and all collected attributes are within a range of acceptable accuracy. See Appendix F, Test Reach Summary Form.

7. After successful completion of the test reach make sure any points that were not covered in the test reach are covered in the field at a later date, these include but aren't limited to:

- **Special Features**

  - **Falls** – Each forest is responsible for establishing criteria for a falls.
    - Is there a minimum height?

- Must it be a permanent feature or can debris jam or spanner log be the cause?

- **Chutes** – Follow definition (see pg 92 in the Stream Inventory Handbook).

- **Dams** – This is a man-made feature; a beaver dam is **not** considered a special feature under this protocol.

- **Marshes** – If marshes take up an area greater than ½ mile in length they should be broken into a separate reach.

- **Culverts –** Look at the dimensions and how each is measured. If possible visit different culvert types. The Special Cases Form has all the attributes that need to be collected. Remember when a culvert with multiple pipes is encountered, choose the one with the best passage for fish.

- **Braids** – Follow definition (see pg 37 in the Stream Inventory Handbook).

- **Vegetation –** How this is collected depends on individual forests. The methodology that each forest follows and vegetation identification needs to be a part of follow-up training.

Test Reach Checklist

- The checklist in Appendix F covers the multiple aspects of stream inventory. Each checklist has only a simple check off of Pass or Needs Work. A comments section is available to elaborate on any problems or good points that may come up during the test reach. These checklists should be filled out during and after the test reach and then shared with survey crews. They will be completed by the QA/QC coordinator.

- A few of the items on the checklist may not be used at the time of the test reach but during other field exercises such as: culvert identification, special feature identification, and discharge measurements.

- The test reach summary sheet has the main areas surveyors will be tested on. This sheet will aid in the comparison of the control data with the surveyors data.

- If a stream survey crew does not pass the test reach more training is needed. The Forest coordinator will spend more time with the crew in the field identifying channel units and emphasizing problem areas that occurred during the test reach. Another test reach will be performed. Once the crew is deemed ready to survey the Forest coordinator should plan to spend extra time with the crew to insure proper techniques are being followed.

AQUATIC BIOTA QA/QC PROCEDURES

Quality Control not only pertains to the Stream Inventory but also to the collection of Aquatic Biota data. It is important that crews can correctly identify fish species in the streams they are surveying. Training should take place on a stream where a variety of species will be seen. A test section of stream can be set up similar to the habitat survey test reach but at a smaller scale. The QA/QC Coordinator can snorkel the section beforehand and have a general idea of the species present. The surveyors should have a clear understanding of the procedures for snorkeling and the safety issues. If the Forest requires counts, be sure to teach any techniques that may aid the surveyors in doing this accurately.

Field Season

The QA/QC Coordinator may want to resnorkel one or two sections during the season with the caveat that fish movement does occur but general species presence should be able to be confirmed.

PROCEDURE FOR QUALITY CONTROL CHECKS DURING THE FIELD SEASON

Quality control field checks consist of two parts to be done by the Forest QA/QC Coordinator or a designated alternate with experience in the stream survey protocol: 1) Accompanying the crew early in the season to ensure that the methodology and procedures are understood 2) surveying a segment of stream that has already been done by the crew and comparing it to the QC crew data (need two people for this QA survey).

Regional involvement will consist of periodic visits by the QA/QC regional coordinator (RC) to the forests. The RC will perform a resurvey of a segment of stream that has already been surveyed by a forest or contract crew. They will then compare the data to determine the precision of the crew. The RC will also review any previous QA/QC checks done by the forest. (Action to be determined after review of the data)

QA/QC Guidelines For Surveyors

The surveyors are a major link in the end product. A quality product starts with the surveyors as the first line of quality control.

1. Every channel unit length is measured. Average widths can be estimated but it is recommended they be measured also. If not, surveyors must calibrate their eyes before starting the survey. This can be done in increments of their choice (i.e. 10’, 25’, or 50’). It may be good to use the average width as a calibration unit as this is usually the hardest estimate to make. A surveyor should not try to estimate a distance more than 50’ long. Calibration should be done throughout the day especially when encountering changing channel types. A clicker can be used to

track measurements so the surveyor will not lose track of the total measurements on long units. Unit lengths should be limited to 500 feet.

2. When choosing a sampling frequency be sure to select a number that will ensure that 10% (or 10 habitats which ever is greater) of slow water units **and** 10% (or 10 habitats which ever is greater) of fast water units will be measured. In addition, **at least** 10 slow water units and 10 fast water units must be measured. For example: If the stream is small, choose a lower number such as 1 in 3 (measuring 1 slow water unit for every 3 slow water units), this will provide you with a higher sampling frequency, therefore measuring more often, to meet the requirement. Fast water units can be done the same way or given a different frequency depending on stream conditions. Once you have 10 slow water units and 10 fast water units measured, the sampling frequency can be changed to the minimum of 1 in 10. Remember if the stream distance is short every fast water unit and slow water unit may need to be measured to meet the minimum requirements.

3. Check SO's, channel unit numbers, and data fields **AFTER EACH FIELD DAY** to ensure all sequenced numbers are right. If information is missing, fill in or explain why it is absent. SO's should be checked throughout the day, such as at lunch or while waiting for a measured unit to be completed. Frequent data checking results in less work later. If any errors are found, make sure that the SO's are corrected on <u>all corresponding data sheets</u>.

4. If bankfull information cannot be collected due to large river or glacial systems, an estimate should be written down. Note in the comments section that this is an estimate and write down the reason for not taking actual measurements.

5. Complete the reach break characterization (Final Reach Form) explaining why the reach was ended before beginning the survey of the upstream reach.

6. Check all data sheets for legibility.

Initial Visit (Informal Project Supervision)

The QA/QC Coordinator will accompany each team for 1 to 3 days to ensure methodology and procedures are understood and being followed. The team leader should answer all questions at this time before doing a formal QA/QC check as described below (See Appendix G for QA/QC Field Evaluation Forms). The initial visit will consist of the following:

1. Generalized question and answer session and written test before beginning hike/survey (See Appendix G for QA/QC Test).

2. Check field forms for completeness and legibility.

3. Complete the QA/QC Field evaluation forms.

4. The Forest QA/QC Coordinator should also evaluate safety during this phase of the visit.

   - Did they do tailgate stretches and safety sessions?

   - Did they talk about possible hiking hazards before they began hiking in? Is a clear route to the stream identified? Are possible routes identified for leaving the stream?

   - Do they have the proper equipment with them such as good working maps, aerial photos, compass, first aid kit, food, Forest Service radio, and appropriate clothing? (see checklist in Appendix E).

   - Do they have a Job Hazard Analysis (JHA) in the vehicle?

Formal QA/QC Visit

- An experienced Forest quality control crew will select a stretch of stream that has already been surveyed to resurvey. Using landmarks such as roads, special features etc. to start a resurvey will aid in following the survey crews data sheets when doing comparisons later. Each crew must be evaluated at least once during the season.

- Experienced crew will survey the selected segment of stream

  - Segment of stream should be from ¼ to ½ mile long.
  - Measure the length, width, and depth of every habitat unit.
  - Measure wood with a diameter tape where possible.
  - Take detailed notes.
  - Bankfull measurements should be taken in at least two locations to compare to the survey crews measurements.
  - A pebble count should be performed in a representative fast water unit.
  - Include a reach break if possible.
  - Try to choose a stream segment that has woody debris.

- Compare the survey crew data to the quality control data through analysis. Graph the two surveys.

- After data comparison share results with survey crew. Address any problems and also praise good work by survey crews.

Regional Involvement

The Regional Office sets direction for QA/QC. The Regional Quality Control Coordinator (RC) will designate forests each year to visit and do QA/QC reviews. Forests can also request a visit for assistance. The RC will not only be evaluating the crews but will also be reviewing the team leader to ensure that QC is being carried out per direction. The RC will evaluate crews performance by surveying a selected area of stream (with local assistance) and comparing results.

POST SURVEY

Post survey QA/QC work consists of gathering all data sheets and checking for errors. This task is done immediately following a finished survey. Another survey will not start until these items have been accomplished. By doing a post survey QA/QC immediately after the survey is completed ensures information is fresh in the surveyors mind, which will help to expedite data entry.

1. All data sheets will be checked and corrected if needed. All numbers should correspond on all data sheets. Channel Unit Form SO's and channel unit numbers should be the same on the Channel Unit Form, Special Cases Form, and Remarks Forms. This becomes especially important if an error was corrected earlier.

2. A post survey checklist with the list of all the forms that need to be completed and tasks that need to be accomplished will be given to the crews to use for follow-up (see Appendix H).

Survey Map

A detailed survey map will be completed on each surveyed stream. These maps should include the following items:

- Reach Breaks.
- Identify tributary locations.
- Location of fish migration barriers.
- Location of timber harvest units with description of buffer size and type of harvest method.

- Impact areas such as campgrounds, road crossings, quarries, mining activity, diversion structures, and grazing.
- Fish sightings (spawning activity, fish presence, habitat utilization).
- UFO or Bigfoot sightings.
- Natural occurrences that are of significant interest such as; large debris jams, beaver dams, large slide areas, and riparian blow down.
- Road crossings with problems (culvert plugged, barrier culvert, erosion, road damage, etc.).

DATA ENTRY

Data entry requires training specific to the database used to store the data. Regardless of what database is selected for initial data entry, all field data must finally reside in the NRIS Water Aquatic Inventory (AI) database. It is the role of the Forest QA/QC coordinator to insure that all survey data is entered into NRIS AI, and that the data accurately represents the field survey. The person or persons entering the data should be familiar with the database and stream survey field procedures and must attend a training session for NRIS AI/AB Data Entry. Individual or group training on the NRIS AI database can be arranged through the Regional Office.

Once the field data has been collected and checked for errors and anomalies, it is ready for entry into the database. Certain checks will be conducted on the data during and after the data entry process by the Forest QA/QC coordinator. It is critical that the data be entered during the field season while the crews are still available if any questions should arise.

Data entry is the point at which the majority of QC problems emerge. Problems in field data collection that were not identified and corrected in the field will now emerge.

Data and Data Entry Preparation

Performing the following items before the start of data entry will reduce the chances of errors being made during data entry.

1. Clean up all data sheets
    a. Make sure SO numbers are correct.
    b. Check all data sheets to see that SO numbers correspond on all data sheets.
    c. Mark the ending SO of every reach with a prominent colored line. This will keep you from entering SO's in the wrong reach.
    d. Make sure all writing on the sheets is legible. Take care of problems before data entry begins.

2. Read the *NRIS AI/AB Data Entry Guide for Region 6 Stream Inventory Data.* (Appendix J). This guide will help troubleshoot many questions you may have regarding data entry. It also has some reference items that can be cut out and taped near your work area to assist during data entry.

During Data Entry

NRIS AI treats each reach as a separate survey. It does not keep track of the SO's for you as you enter the data for your reach. It will not prompt you to start the next reach when the last SO in your reach is entered. Be sure to mark the reach endpoints well on your data sheets to avoid having to delete channel units from the database.

The SO numbers do not sequence automatically. Care must be taken to insure that the right sequence is maintained. No channel unit numbers will be entered. This is used only for the field copies for keeping track of measured unit frequency.

1. Please refer to the *NRIS AI/AB Data Entry Guide for Region 6 Stream Inventory Data* and the *User Guide for NRIS Water* for guidance while entering data.

2. Data must be entered during the field season so field crews can be utilized to answer any questions about data problems. Data should be entered after each survey.

3. "River Miles" refers to the actual river mile at which you started. For Example, if you began your survey at the Forest Boundary which was 1.5 miles up from the mouth, your River Miles would begin at 1.5 miles and progress up from there.

4. If data looks suspicious, check the field notes or ask the crews to validate the data. If there are any errors in number sequencing on the data sheets, return these to the field crews for corrections.

After Data Entry

1. When data entry is completed, a Channel Unit Form Dump must be run. A separate dump will have to be run for each reach. **Queries to check the following items will be available from NRIS Access Tools** (See Appendix J for instructions on how to run the NRIS Queries)**.** Also check the following parameters by hand:

   - **Length –** Shorter than width (OK in plunge pools).
   - **Width –** Longer than length.
   - **Depth –** Look for misplaced decimals and unusually deep units.
   - **Average Depth (if collected) –** Is it less than the max depth?
   - **Pool Crest Depth –** Is it less than max depth?
   - **Check to see if measured units correspond with estimates.**
   - **Look at unusual wood numbers –** Tally marks interpreted as a number.
   - **Check SO's to make sure they are in the right reaches.**

2. Correct any errors found and then reports can be run through NRIS Access Tools.

3. Regional coordinator will begin to run periodic checks from the Regional Office at the end of January. Error reports will be sent to the respective forests and given a specific timeline for correction. These areas will be checked again to ensure that corrections have been made.

4. Queries will be available through NRIS Access tool to check the data.

5. Stream Inventory Data will be entered by the end of December each calendar year.

Regional Requirements for Data Entry (Timelines)

Stream Inventory data from the previous summer season must be entered by the end of the calendar year in which the data was collected. The Regional QA/QC Coordinator will begin checking the data the following January. Several items will be evaluated:

1. Do the stream miles entered in the database match the target miles designated by the Regional Office?

2. Has the Aquatic Biota data been entered and do the miles match the target miles designated by the Regional Office?

3. Quality of the data. If there are errors found in the data those will be sent back to the forest for correction or clarification. A due date for completion of this task will be given at that time. Regional Office assistance will be provided if needed to help with data cleanup. Once the date for correction of the errors has passed the QA/QC Coordinator will recheck the data to ensure corrections have been made. If for some reason an error cannot be corrected or it is not an error the forest data steward should respond to the QA/QC Coordinator with an explanation.

APPENDIX A

PROVINCE DESCRIPTIONS

W.WA	MBS/OLY/GIP
NW.OR	MTH/WIL/SIU/CRSA
SW.OR	SIS/ROR/UMP
Blues	UMA/WAW/MAL
NE.WA	WEN/OKA/COL
SE.OR	DES/WIN/FRE/OCH

APPENDIX B

SAMPLE STREAM SURVEY REPORT

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Appendix C – Temperatures at Measured Units and Tributaries

Appendix D – Pertinent Standards and Guidelines of the Mt. Hood National Forest and Management Plan (LRMP), Region 6 Desired Future Conditions from the Project Implementation Guide (PIG), National Marine Fisheries Service (NMFS) Matrix of Pathways and Indicators, and Record of Decision, Standards and Guidelines for Management of Habitat for Late Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (Riparian Reserve Information)

Appendix E – Pebble Count Data

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Appendix H– Detailed Snorkel Data

Appendix I – Representative Habitat Units and Special Feature Photos

The 2002 Dutch Creek Stream Survey Report
Mt. Hood National Forest
Clackamas River Ranger District

OVERVIEW

Dates Surveyed: September 9th to September 23rd, 2002
Survey Type: Region 6 Stream Inventory Methodology, Version 2002, Level II
Mouth Location: T7S, R6E, Sec. 8, SW 1/4
Headwater Location: T6S, R5E, Sec. 36, SE 1/4
USGS Quadrangle: Bull of the Woods, Bagby Hot Springs, Fish Creek, and Wanderers Peak
Watershed (4th Field): Hot Springs Fork
Subwatershed (6th Field): Dutch Creek
Tributary To: Hot Springs Fork
NFS Watershed No.: 17, 09, 00, 11, 26, G
Drainage Area (subwatershed): 1128 acres
Stream Order at Mouth: Second
Discharge Rate / Date: 0.6 cubic feet per second (cfs) / September 9, 2001
Stream Class at Mouth: I
Distance Surveyed: 2.7 miles (from the mouth)
Stream Length: 2.7 miles
Surveyors: Katie Serres and Rose Christensen

EXECUTIVE SUMMARY

Dutch Creek was surveyed from the mouth to the headwaters at River Mile (RM) 2.7 during the summer of 2002. The last fish observed during the survey, likely a cutthroat trout (*Oncorhynchus clarki*), was at RM 0.5. A snorkel survey was completed for Dutch Creek at the mouth and at RM 1.0. *Oncorhynchus* sp. were observed near the mouth while none were identified at RM 1.0.

Dutch Creek did not meet the Mt. Hood National Forest Land and Management Plan (LRMP), the Columbia River Basin Project Implementation Guide (PIG) Standards and Guidelines, and the National Marine Fisheries Service (NMFS) Guidelines for woody debris density. Dutch Creek did not meet LRMP, NMFS, or PIG pool standards.

Very coarse gravel (45-64 mm) and large cobble (180-256 mm) accounted for 12% and 15% respectively of the total count for Reach 1. Coarse gravel (22.3-32 mm) and substrate in the fine category (<2 mm) each accounted for 10% of the total count for Reach 2.

The average solar radiation for the survey area was 29%. The low solar pathfinder readings near the beginning of the stream and near RM 2.5 can be attributed to dense conifer cover. The exceptionally high readings near RM 1.0 and RM 2.1 were both taken at channel units adjacent to timber harvests.

BASIN DESCRIPTION

WATERSHED AND FLOW REGIME

General Characteristics

- **Location:** Dutch Creek is located south of East Mountain and Fish Creek basin, east of Skookum Lake, north of Bull of the Woods Wilderness, and flows into Hot Springs Fork from the north.

- **Stream Order**

  - Second order from River Mile (RM) 2.6 to the mouth.

  - First order from headwaters (RM 2.7) to RM 2.6.

- **Flow:** A discharge rate of 0.6 cfs was recorded at the mouth on September 9th, 2002.

- **Elevation and General Gradient:** Dutch Creek flowed from the headwaters at an elevation of 4240 feet over a distance of 2.7 miles to the mouth at an elevation of 1840 feet. Using digitized map miles, an average gradient of 16.8% was calculated. For gradients measured in the field by reach, see table 1.

- **Sinuosity:** The sinuosity on Dutch Creek was low.

Reach Summaries

- **Table 1** illustrates the major channel characteristics used to delineate the reaches. The criteria are detailed in Appendix A.

Table 1. Stream survey data used as delineative criteria for making reach breaks.

Reach	To SO	To River Mile	Avg. Width ft	Entrench-ment Ratio	Width to Depth Ratio	Average Percent Gradient	Dominant Substrate	Rosgen Channel Type	Valley Form
1	125	1.0	10.2	1.71	16.7	9.8%	Cobbles	B3a	Moderate v-shaped
2	302	2.7	8.9	1.53	17.5	20.5%	Gravels	A4a+	Narrow v-shaped

- **Note:** See Tables 2-6 for more reach specific information. Survey maps showing the reach breaks are located in Appendix B. Photographs of representative habitat units and special features appear in Appendix I.

- **Definition of Stream Classification:** The Mt. Hood National Forest Stream Survey Program is now using the three-class system.

  - **Classification I** = municipal watersheds and/or fish-bearing streams (perennial or intermittent).
  - **Classification II** = non fish-bearing, perennial streams.
  - **Classification III** = non fish-bearing, intermittent streams.

- **Reach 1**

  - **Classification:** Reach 1 was defined as Class I.

  - **Frequency of Measured Units:** Every fourth pool and riffle was measured up to SO 42, SS25 and SO 62, F25 where the frequency was changed to every tenth pool and riffle.

  - **Access:** Access to Reach 1 was good. Forest Service (FS) Road 70 and FS Road 6320 were used to obtain access.

  - **Useful Reach Information:** The culvert at FS Road 6320 (RM 0.9) has been removed since the last stream survey in 1994 due to the 1996 floods and the stream channel has been reconstructed. FS Road 6320 to the east of the stream was still drivable while the road to the west of the stream has been torn up and is no longer drivable. Power lines crossed the stream between RM 0.6 and RM 0.8 resulting in a upland area lacking a conifer component. A section of dry channel was identified under the power lines at RM 0.8 (SO 101, ND2, photo 18). A build up of wood and boulders created a 272-foot long section of subsurface flow.

- **Reach 2**

  - **Classification:** Reach 2 was defined as Class I.

  - **Frequency of Measured Units:** Every tenth pool and riffle was measured.

  - **Access:** Access to Reach 2 was more difficult due to steep slopes and dense vegetation. FS Road 4620 and FS Road 4620/330 were used to obtain access.

  - **Useful Reach Information:** Steep gradient, a narrow valley floor, and steep valley walls were characteristic of Reach 2. The first permanent barrier to fish passage was found in Reach 2. Two consecutive bedrock chutes that may act as barriers were identified at RM 1.2 (SO 139 and 141, CH1 and CH2, photos 24 and 25). An 8-foot waterfall that may act as a barrier to fish passage was identified at RM 1.3 (SO 148, WF2, photos 26 and 27). Dense vegetative cover over the stream consisting of sitka alder, sitka willow, and small conifers were characteristic of the last half mile of the stream.

Tributaries

- **Access to Fish out of the Mainstem:** Tributary 1 entered Dutch Creek under the power lines and contributed a significant amount of flow to the stream. The tributary originated from springs just up slope from Dutch Creek. The other tributaries to Dutch Creek were much less significant. All allowed access to fish with the exception of Tributaries 3, 5, and 6. These tributaries were considered too steep to provide access to fish from the main stem.

Table 2. The tributaries observed, their approximate location, contribution to the mainstem flow, temperature and time of reading, downstream bank orientation and gradient at the confluence.

Tributary Stream Name	SO*	River Mile	% Flow Contribution	Temperature °C	Time Hours	Downstream Bank Orientation	% Gradient at Mouth	Access to Fish
1	98	0.75	20%	11.0	1525	Left	5%	Yes
2	197	1.5	Dry	NA	NA	Left	15%	Yes
3	201	1.6	2%	7.5	1255	Right	50%	No
4	217	1.8	2%	8.0	1050	Right	40%	Yes
5	255	2.2	1%	15.0	1310	Left	50%	No
6	271	2.3	1%	9.0	1425	Right	50%	No
7	276	2.4	5%	No Data	No Data	Left	10%	Yes
8	292	2.6	30%	5.5	5.5	Left	5%	Yes
9	294	2.6	20%	6.0	6.0	Left	5%	Yes

*SO of the habitat unit where the tributary enters the stream

FAUNAL COMMUNITY

Fish Community

- **Fish Presence:** The last fish observed during the survey, likely a cutthroat trout (*Oncorhynchus clarkii*), was at RM 0.5 (SO 74, F30). A snorkel survey was completed for Dutch Creek at the mouth and at RM 1.0. *Oncorhynchus* sp. were observed near the mouth while none were identified at RM 1.0. A 1994 resident fish distribution study found fish up to RM 1.1. With cutthroat, steelhead, and sculpin found near RM 0.1 and only cutthroat identified in the upper section near RM 1.1. See Appendix H for more detailed snorkel data.

- **Barriers to Fish Passage:** Numerous potential low flow barriers in the form of debris jams were identified, as well as two sections of dry channel, three bedrock chutes, and seven waterfalls. Following is a list of the potential barriers identified.

  - SO 9, ARTIF1, RM 0.1 – Culvert with a jump height of 0.5-feet, a length of 72-feet, and a gradient of 7% may act as a barrier (photos 4 and 5).
  - SO 28, WF1, RM 0.2 – Potential low flow barrier in the form of a channel spanning log with cobble built up behind it causing a 5-foot drop in stream elevation (photo 7).

- SO 42, SS25, RM 0.2 – Potential low flow barrier in the form of a channel spanning log with cobble built up behind it causing a 5-foot drop in stream elevation.
- SO 51, SS29, RM 0.3 – Potential low flow barrier in the form a debris jam acting as a strainer.
- SO 66, SS37, RM 0.4 – Potential low flow barrier in the form of a debris jam with cobble built up behind it causing a 3-foot drop in stream elevation (photo 13).
- SO 73, ND1, RM 0.5 – 24-foot long section of subsurface flow due to a build up of cobble behind a large debris jam (photo 14).
- SO 95, F40, RM 0.7 – Massive debris jam with cobble built up behind it causing a 12-foot drop in stream elevation (photo 16).
- SO 101, ND2, RM 0.8 – Build up of wood and boulders under power lines creating 272-foot long section of subsurface flow (photo 18).
- SO 139 and 141, CH1 and CH2, RM 1.2 – Two consecutive bedrock chutes that may act as barriers (photos 24 and 25).
- SO 148, WF2, RM 1.3 – 8-foot waterfall that may act as a barrier to fish passage (photo 26 and 27).
- SO 188, CH3, RM 1.5 – 37-foot long bedrock chute (photo 30).
- SO 212, WF3, RM 1.75 – A series of waterfalls over a distance of 125-feet with a total height of 140-feet (photos 32 and 33).
- SO 214, WF4, RM 1.75 – 5-foot water fall that may act as a barrier to fish passage (photo 34).
- SO 252, WF5, RM 2.1 – 18-foot waterfall (photo 38 and 39).
- SO 259, WF6, RM 2.2 – 16-foot waterfall (photo 40).
- SO 268, WF7, RM 2.2 – 28-foot waterfall (photo 42).

Other Fauna

- **Amphibians**

  - Red-legged frogs were identified at RM 1.0 (SO 116, SS61) and RM 1.6 (SO 203, F85).

  - Rough skin newts were identified at RM 2.0 (SO 237, F100).

IN-CHANNEL HABITAT

Temperature

- **Note:** No Hobo temperature probe was placed in the stream given that the stream survey was requested late in the field season. Temperatures were recorded in degrees Celsius at each measured unit and in the mouth of each tributary encountered using a hand held thermometer. These temperatures are detailed in Appendix C. The temperatures recorded did not exceed 13°C.

Woody Debris

- **Woody Debris Density:** Definitions of woody debris size categories can be found below in Table 3. Figures for existing woody debris in the medium and large size categories are located below in Table 4. **NOTE:** Only woody debris that is within the bankfull channel and meets the size criteria below is counted.

Table 3. Definition of wood size classes west of the High Cascades.

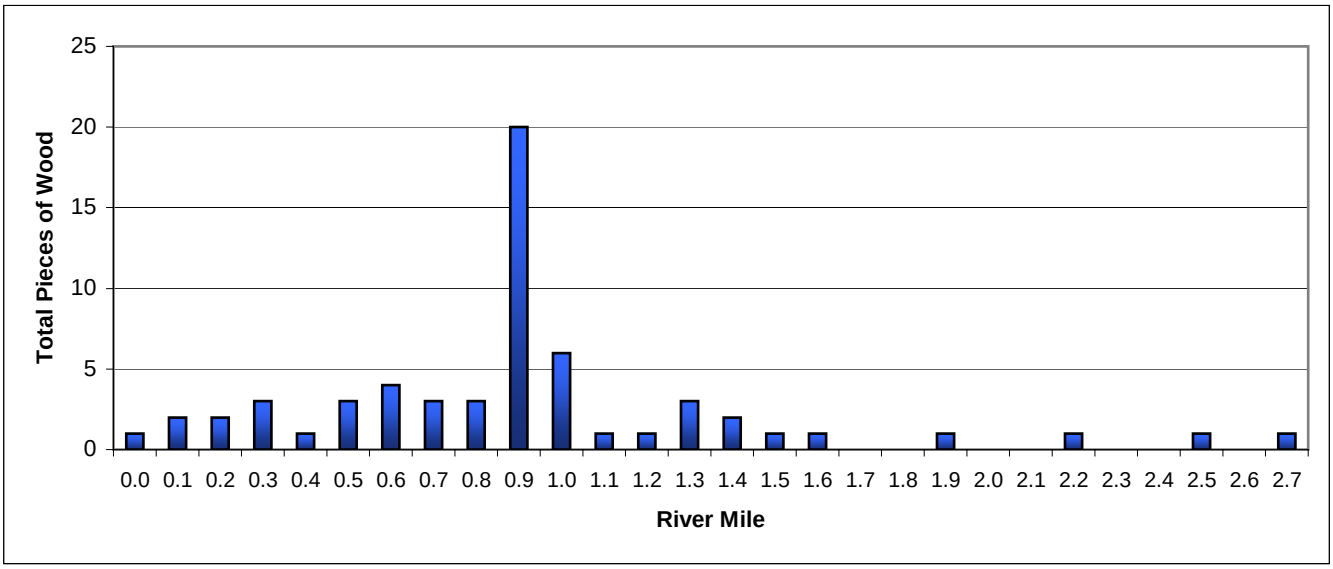
Size	***Diameter***	***Length***
Small	>12 inches at 25 feet from large end	>25 feet or 2X the bankfull width
Medium	>24 inches at 50 feet from large end	>50 feet or 2X the bankfull width
Large	>36 inches at 50 feet from large end	>50 feet or 2X the bankfull width

- **Desired Future Conditions (DFC):** Comparisons of the existing in-channel woody debris densities per miles to westside LRMP, PIG, and NMFS standards can be found below in Table 4 and are discussed further in this section. The pertinent Forest Plan, PIG, and NMFS standards have been excerpted from their respective documents and appear in Appendix D.

Table 4. Existing number of in-channel woody debris and woody debris density vs. the LRMP, PIG, and NMFS standards (total of both medium and large size classes).

Reach	**Corrected Length**	**Number of Pieces In-Channel**				**Density per Mile**			**Standard Density per Mile**	
		Small	**Medium**	**Large**	**Total**	**Medium**	**Large**	**Total**	**LRMP**	**PIG/NMFS**
1	1.24	66	27	21	48	21.8	16.9	**48.7**	**106**	**80**
2	1.77	29	7	6	13	3.95	3.39	**7.34**	**106**	**80**

Graph 1. Wood Distribution (medium and large size classes only)



- **DFC Discussion:** The wood counts in Dutch Creek did not meet LRMP, PIG, or NMFS wood density standards. However, recruitment potential was high in Reach 1 near the old FS Road 6320 crossing (SO 110, F46, RM 0.9). Downed large woody debris was abundant from RM 0.8 through RM 1.0, although it was above bankfull and therefore was not included in the wood count. Much of the wood at this location appeared to have been placed there after the culvert removal project.

- **Small Sized Wood:** Wood in the small size category consisted of 58% of the total countable wood in Reach 1 and 69% in Reach 2.

- **Debris Jams: A debris jam is defined as a complex of wood with 3 or more pieces. The wood does not need to be in a countable category.**

  - Fifty six percent of the countable wood in Reach 1 was located in debris jams. Of the wood that made up the debris jams in Reach 1, 58% were smalls, 25% were mediums, and 17% were larges. Thirty eight percent of the wood in Reach 2 was identified in debris jams with 62% smalls, 19% mediums, and 19% larges.

Graph 2. Debris Jam Distribution and the number of debris jams found in each location by River Mile.

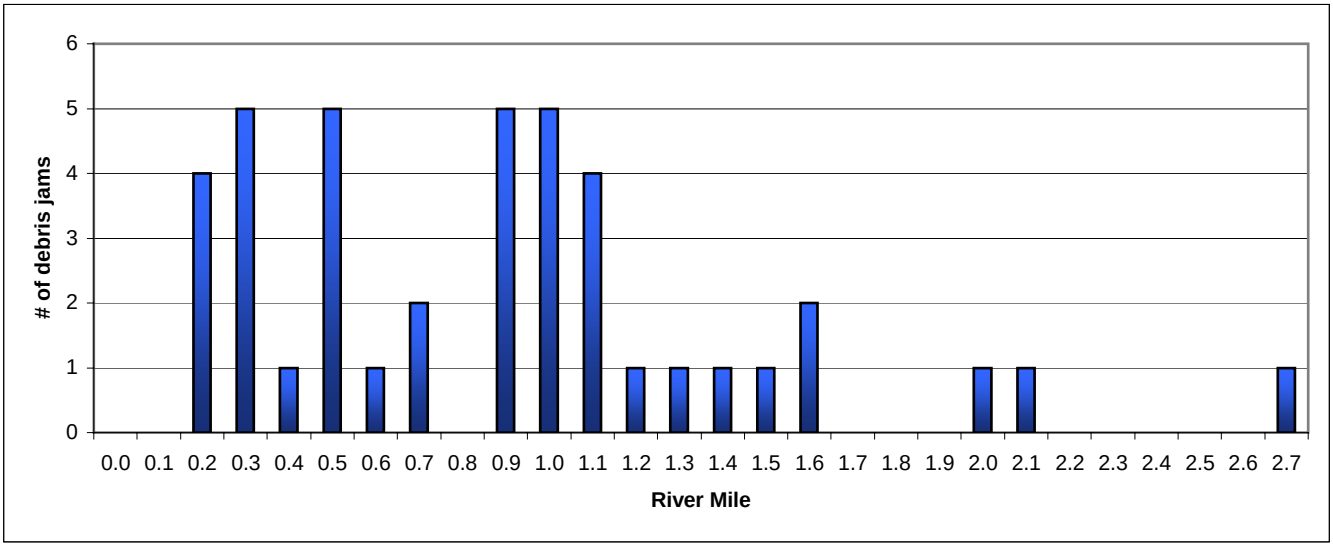


Table 5. Debris Jam Information – Existing number of in-channel woody debris and where it was located either as isolated pieces (single) or in debris jams.

Reach	# of Debris Jams	Total Pieces of Woody Debris					
		Small		Medium		Large	
		Single	Debris Jam	Single	Debris Jam	Single	Debris Jam
1	28	29	37	11	16	10	11
2	12	19	10	4	3	3	3

Pools

- **Note:** Under current surveying procedures, a pool is defined as any habitat unit possessing pronounced scour, a hydraulic control at the tail crest, and greater depth and lower average velocities than surrounding non-pool units. The overall availability of pool habitat to fish and the average dimensions of existing pools are also taken into account when identifying habitat units. The number of pools per reach, pool frequency and pool to riffle ratio appear below in Table 6.

- **Desired Future Conditions:** Comparisons of the existing pool frequencies per mile to LRMP, PIG, and NMFS standards can be found below in Table 6 and are discussed further in this section.

Table 6. Existing number of pools; primary pools (pools >=3' depth) frequency vs. The LRMP standard; and frequency of pools of all depths vs. the PIG and NMFS standards (shaded columns).

Reach	Correct. Length	Avg. Bankful lWidth	Avg. Width Wetted	Pool to Riffle Ratio	Total Number		Primary Pools per Mile	LRMP Standard per Mile	Pools all Depths per Mile	NMFS Standard per Mile	PIG Standard per Mile
					Primary	All Depths					
1	1.24	15.3	10.19	1:3.6	2	65	**1.6**	**115.0**	52.4	70	56
2	1.77	15.1	8.91	1:7.8	5	87	**2.8**	**116.6**	49.2	96	96

- **DFC Discussion:** Dutch Creek did not meet LRMP, NMFS, or PIG pool standards.

- **Pool Quality:** Average residual depth for both reaches was 1.3 feet.

- **Step-pool Sequences: A step pool sequence is a step-like series of riffle and pool units in a high gradient segment of stream. If pool habitat dominates a step pool sequence it means that there are a number of pools in sequence with a short riffle in between. The riffle is added to the upstream habitat length. If riffle habitat is dominant it means that pocket pools are located in the habitat unit but are not channel spanning and can't be broken out into separate units.**

  - Five percent of the pools in Reach 1 were identified as step-pools and 9% of the riffles contained pocket pools. In Reach 2, 8% of the pools were step-pools while 20% of the riffles contained pocket pools. Pocket pools in riffles provide important resting habitat for fish.

- **Pool Forming Forces:** The major forces that appeared to be creating the pools in Dutch Creek were identified in each pool unit. In Reach 1, boulders appeared to be the major force creating 55% of the pools, wood – 41%, bedrock – 2%, and stream bends – 2%. In Reach 2, boulders were responsible for the creation of 49% of the pools, bedrock – 34%, wood – 15%, and a culvert formed one pool.

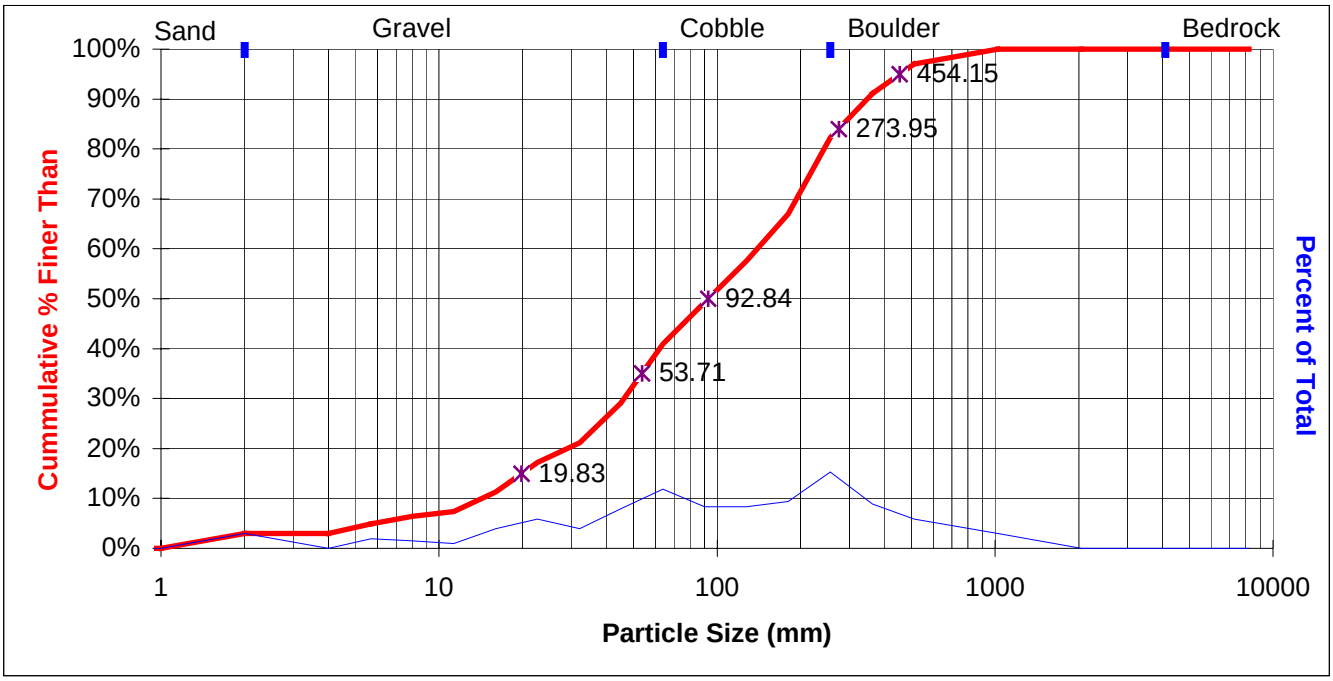
Spawning Gravels and Pebble Counts

- **NOTE:** The current procedure for conducting pebble counts under the Region 6 Stream Inventory Protocol calls for two pebble counts per reach of 100 pebbles each to be performed in representative riffles from bankfull to bankfull.

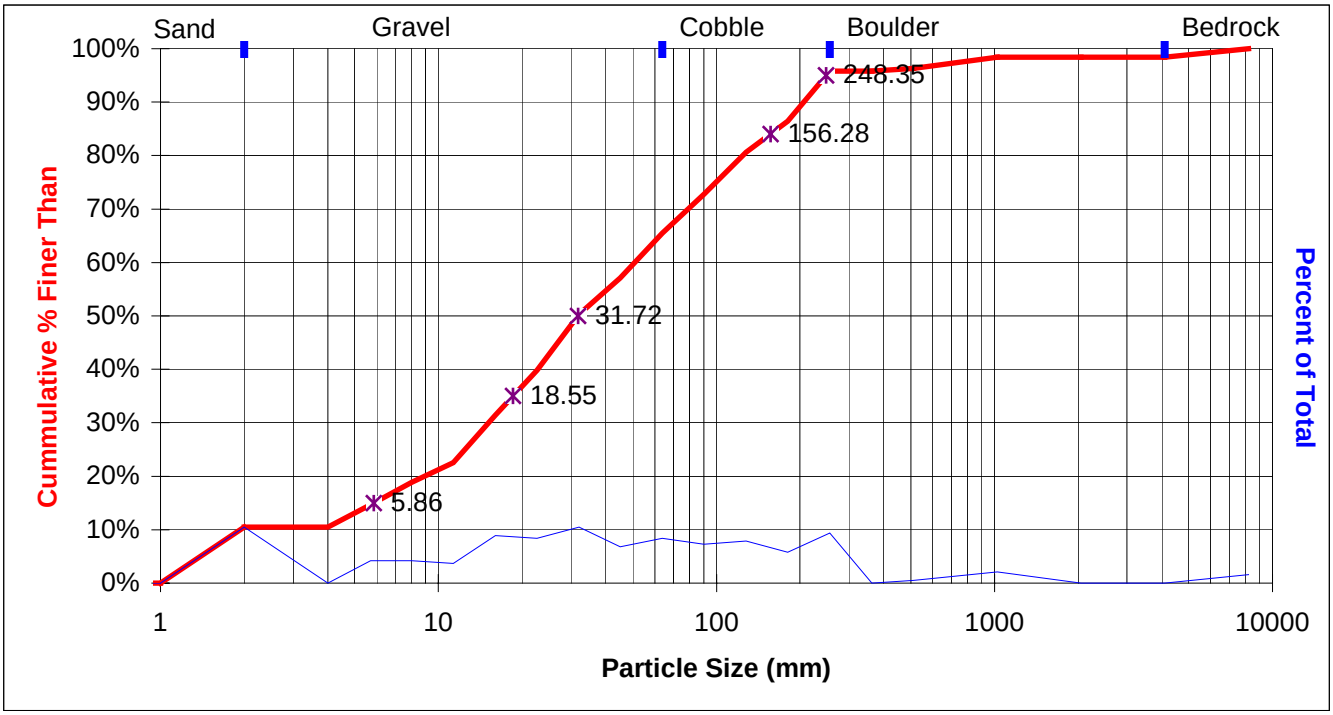
- Very coarse gravel (45-64 mm) and large cobble (180-256 mm) accounted for 12% and 15% respectively of the total count for Reach 1. Coarse gravel (22.3-32 mm) and substrate in the fine category (<2 mm) each accounted for 10% of the total count for Reach 2.

- Graphs 3 and 4 display pebble count data while more detailed information can be found in Appendix E. Numbers displayed on the graph are the pebble size in mm at the D15, D35, D50, D85, and D95 percentages.

Graph 3. Pebble Count - Percent Totals – Reach 1



Graph 4. Pebble Count – Percent Totals – Reach 2



Special Habitats

- **Side Channels:** Side channels comprised 2.6% of the habitat in Dutch Creek and were dominated by riffle habitat.

RIPARIAN HABITATS

Upslope Vegetative Composition

- **NOTE:** The collection of upslope plant associations generally occurs in the riparian reserve as described in the Standards and Guidelines for Management of Habitat for Late successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (USDA, BLM 1994).

- **Upslope Plant Associations:** Plant associations were determined at measured units on the upper valley slopes using methodology outlined in the Plant Association and Management Guide for the Western Hemlock Zone (USDA, 1986). Descriptions of the plant associations below have been excerpted from the guides. Several different associations were identified in the upslope areas and only the associations that occurred with the highest frequency are included below.

- **Upslope Canopy Composition:** The upslope canopy composition varied along the length of the stream. Medium and small sized trees were dominant along the majority of the stream, with the exception of the area between RM 1.4 and RM 1.75. Here, the canopy consisted of large trees with no evidence of timber harvest activity. Western hemlocks were the dominant tree species identified.

Reach 1

- **Western Hemlock/Dwarf Oregongrape-Salal (TSHE/BENE-GASH):** This association represents moderately warm/dry environmental conditions within the Western Hemlock Zone. The canopy in often quite open, and usually consist of a mixture of Douglas-fir and Western hemlock, often with Western Red cedar (pg 62). This association was identified in 43% of the measured units.

- **Western Hemlock/Dwarf Oregongrape/Swordfern (TSHE/BENE/POMU**): This association is found on moderately moist and warm sites which are very well drained (pg. 64). This association was identified in 33% of the measured units.

Reach 2

- Timber harvest units were identified in 88% of the measured units of Reach 2. No associations were identifiable in these units.

Riparian Vegetative Composition of Zone 1 and Zone 2

- **Definition of Vegetation Zones**

  - **Zone 1:** The frequent flood zone, or bankfull area, which encounters flood stage on an average of less than every 1.5 years. Vegetation in this zone is often composed of riparian dependent species.

  - **Zone 2:** The floodprone area defined by channel entrenchment and flood flow confinement. Zone 2 encounters floods much less frequently than Zone 1 (approximate 50-year frequency). As a result, vegetation associated with Zone 2 is often not made up of riparian dependent species.

- **Vegetation in Zone 1 and Zone 2:** Dominant riparian plant associations and zone widths can be found below. Riparian plant associations were determined using methodology from Riparian Ecological Types for the Gifford Pinchot and Mt. Hood National Forests and the Columbia River Gorge National Scenic Area (USDA, 1996). Descriptions of the plant associations below have been excerpted from the guide. Please refer to the guide for more detailed descriptions of the plant associations and communities described below.

- **NOTE:** Several different associations were identified in both Zone 1 and Zone 2 and only the associations that occurred with the highest frequency are included below.

Description of Riparian Vegetation

Reach 1

- **Zone 1**

  - No vegetation was found growing in the bankfull area 88% of the measured units.

  - **Coltsfoot (PEFR2):** This plant community is found on cobble deposits that have a saturated root zone for most of the growing season. It represents sites that are within the floodprone zone that are subject to intense high flows every few years. It can be a source of foliar input and may in some cases entrap fine materials and organic debris (pg. 179). This association was identified in the bankfull area of 7% of the measured units.

- **Zone 2**

  - No vegetation was found growing in floodprone area 38% of the measured units.

- **Coltsfoot (PEFR2):** Refer to the previous description. This association was identified in the floodprone area of 17% of the measured units.

- **Red Alder/Piggyback Plant/Siberian Miner's Lettuce (ALRU/TOME/MOSI):** This plant community reflects warm, moist, productive riparian environments with relatively long growing seasons. It provides significant shade and foliar input to the stream, slope stabilization, and enhancement of site productivity through nitrogen fixation by red alder (pg. 79). This association was identified in the floodprone area of 10% of the measured units.

- **Red Alder (ALRU):** This association represents open, warm, cobbly riparian sites with a relatively long growing season and high water table. It may represent an intermediate seral stage or, if inundated with sufficient frequency, the ultimate successional stage (pg. 103). This association was identified in the floodprone area of 10% of the measured units.

- **Sitka Willow (SASI2):** This plant community represents riparian sites, probably frequently inundated, with a relatively long growing season and coarse, moist substrates. It can provide significant shade, especially in narrow channels. It is a good stabilizer of the loose, coarse textured substrates on these sites (pg. 135). This association was identified in the floodprone area of 10% of the measured units.

Reach 2

- **Zone 1**

  - No vegetation was found growing in the bankfull area 81% of the measured units.

  - **Coltsfoot (PEFR2):** Refer to the previous description. This association was identified in the bankfull area of 13% of the measured units.

- **Zone 2**

  - No vegetation was found growing in the floodprone area of 22% of the measured units.

  - **Red Alder/Coltsfoot (ALRU/PEFR2):** This plant community represents wet riparian sites with coarse alluvial deposits low in organic matter, that have been subjected to high flows within the last two to several decades. It provides significant shade and foliar input to the stream, slope stabilization, and enhancement of site productivity through nitrogen fixation by red alder (pg. 59). This association was identified in the floodprone area of 34% of the measured units.

  - **Sitka Alder/Sitka Willow/Coltsfoot (ALSI/SASI/PEFR2):** This assemblage does not represent an association identified in the forest guide Riparian

Ecological Types. ALSI, SASI, and PEFR2 all represent moist sites. This assemblage was identified in the floodprone area of 16% of the measured units.

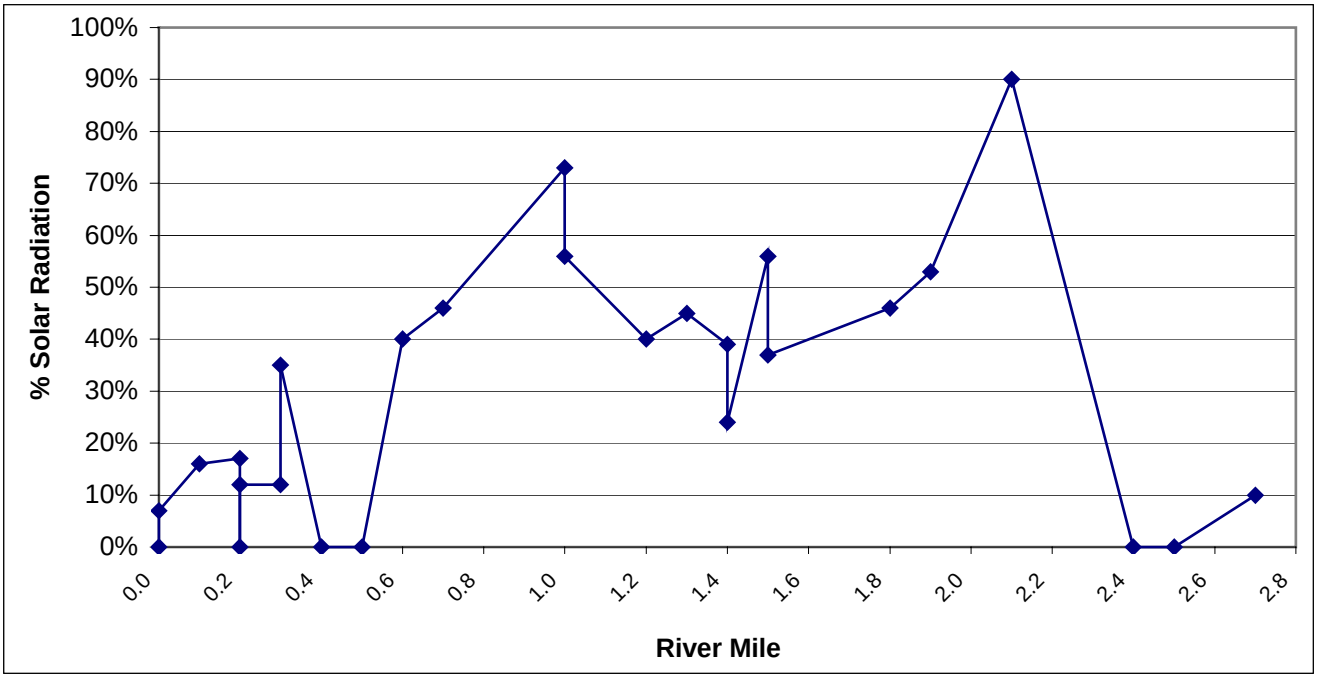
Solar Radiation

- Solar radiation was sampled at approximately 50% of the measured units. Actual solar pathfinder readings normalized for the month of July can be found in Appendix F. The readings are normalized for the month of July because this is the month with the greatest amount of solar radiation. This standardized month can then be used for future comparisons. Graph 5 displays these readings. Average solar radiation reaching the sample site during other months can be read from the solar pathfinder diagrams, which can be obtained by request from the Stream Survey Coordinator at the Clackamas River Ranger District.

- The average solar radiation for the survey area was 29%. The low solar pathfinder readings near the beginning of the stream and near RM 2.5 can be attributed to dense conifer cover. The exceptionally high readings near RM 1.0 and RM 2.1 were both taken at channel units adjacent to timber harvests.

- **NOTE:** Several of the solar pathfinder reading displayed in Graph 5 appear to have been taken at the same locations, when in fact they were taken at different measured units close to one another.

Graph 5. Solar Radiation Readings Normalized for the Month of July.



MANAGEMENT ACTIVITIES / IMPACTS

Roads

- **NOTE:** Detailed culvert information can be found in Appendix G.

- FS Road 70 crossed Dutch Creek at RM 0.1 (SO 9, ARTIF1, photos 4 and 5). The elliptical culvert was 72 feet long, 9 feet wide, and was in good condition.

- FS Road 4620 crossed Dutch Creek at RM 2.4 (SO 275, ARTIF2, photos 43 and 45). The round culvert was 85 feet long, 5 feet wide, and was in good condition.

Timber Harvest

- Much of the upslope area along Dutch Creek has been exposed to timber harvest activities in the past. The timber harvest units are in various stages of regeneration. Following is a general description of the upslope condition.

    - Timber harvest units were present with generous riparian buffers from RM 0 through RM 0.6.

    - The power lines were located between RM 0.6 and RM 0.8. There was no conifer component to the upslope canopy at this location and the stream was exposed to high solar radiation.

    - Timber harvest units with very little riparian buffer were located from RM 0.8 through RM 1.4.

    - The canopy consisted of large trees with no evidence of timber harvest activity from RM 1.4 through RM 1.75.

    - Timber harvest units were present with very little large wood components from RM 1.75 through RM 2.7. The regeneration was at various stages along the stream.

Bank Stability

- Seven percent of the banks were identified as unstable in Reach 1. Four percent of the banks were unstable in Reach 2. Landslides were common along Dutch Creek and were observed at the following locations.

    - SO 54, F21, RM 0.3 – Large landslide on east bank (photo 10).
    - SO 178, F75, RM 1.4 – Landslide on north east bank contributing a great deal of coarse and fine materials to the stream (photos 28 and 29).
    - SO 229, F96, RM 1.9 – Landslide on west bank with materials sluffing off into stream.
    - SO 245, F104, RM 2.1 – Landslide on south bank that was approximately 30-feet in length (photo 37).
    - SO 273, F117, RM 2.4 – Landslide depositing fine material into the stream.

RECOMMENDATIONS

- Evaluate the feasibility of removing the culvert at FS Road 70, RM 0.1. A non-permanent low flow barrier was present at RM 0.2 and could limit the amount of anadromous habitat that would be gained. Several small chutes and falls were present from RM 0.1 to 1.7 that could be low flow barriers. The first major permanent barrier was located at RM 1.7.

REFERENCES

Corkran, Charlotte C., and Thoms, Chris. 1996. Amphibians of Oregon. Washington, and British Columbia. Lone Pine Publishing, Edmonton Alberta.

Rosgen, D. 1996. Applied River Morphology, Prepress, Lakewood, CO

US Department of Agriculture (USDA), Forest Service. 2001. Region 6 Stream Inventory Handbook, Level II, Version 2.1.

US Department of Agriculture (USDA) Forest Service 1988 N. Halverson, C. Tom High, Plant Association and Management Guide for the Ponderosa Pine, Douglas fir, Grand Fir Zones, Mt. Hood National Forest.

US Department of Agriculture (USDA), Forest Service. 2001. McCain Cindy, Diaz Nancy. Field Guide to the Forested Associations of the Westside Central Cascades of Northwest Oregon.

US Department of Agriculture (USDA) Forest Service 1988 N. Halverson, C. Tom High, Plant Association and Management Guide for the Ponderosa Pine, Douglas fir, Grand Fir Zones, Mt. Hood National Forest.

US Department of Agriculture (USDA), Forest Service. Bureau of Land Management 1994. Record of Decision, Standards and Guidelines for Management of Habitat for Late successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl.

APPENDIX C

Stream Inventory Program
Stream Inventory Request Form

District:
Stream Name / Mileage:
Location of Start Point (township,range, section):
GPS Coordinates of Start Point (if available):
Reasons for your request for survey this year:

1)

2)

3)

Management activities influencing the basin:

1)

2)

3)

Future Project Plans:

Knowledge of Fish Presence, Historical Presence, Barriers, etc.:

Access Problems:

Identify special habitat or problem areas:

Past stream surveys or other studies conducted on this stream:

APPENDIX D

Pre-survey Checklist

- ❑ Survey Form Completed
- ❑ Preliminary Reach Form Completed
- ❑ Reports from Previous surveys
- ❑ Maps of watershed area and digitized map with stream miles
- ❑ Reach breaks defined using NRIS Water GIS Stream layer to assure LLID and data integrity
- ❑ Field maps with preliminary reach breaks (recommend map wheeled stream miles also) on write-in-the-rain- paper
  - ❑ Road closures or special road uses identified
- ❑ Aerial photos or color copies of aerial photos that cover the entire stream and accompanying road network
- ❑ Thermograph audited and deployed
- ❑ Flow meter operational
- ❑ Private land permission/denial
  - ❑ Contact Persons name _____
- ❑ Contact with district biologists and hydrologists about issues regarding the survey
- ❑ Survey endpoint fully understood (i.e. end of fish, barrier, etc.)
- ❑ Proper equipment ordered
- ❑ JHA reviewed by surveyors
- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____

APPENDIX E

Field Gear Checklist and Cheat Sheet

-DAILY CHECKLIST-
- Boots and Socks
Clipboard
- Lunch
- Pencils
- Radio
- Staff
- Vest
- Watch
- Water
- **LIGHTS OFF!!!**

-**CLIPBOARD-**
- Aerials
- Channel Unit Forms
- Special Cases Forms
- Maps
- Pebble Count Form
- Vegetation Keys

-**OTHER**-
- Lunch and Extra Food
- Extra Water
- Extra Clothing
- Bug Dope
- Sunscreen
- Toilet Paper

-VEST-
- Camera
- Extra Film
- Abney Level
- Compass
- Emergency Blankets
- First Aid Kit
- Flagging
- Measuring Tape
- Field Notebook
- Pencils
- Radio & Batteries
- Ruler
- Solar Pathfinder
- Solar Pathfinder Forms
- Staff
- Stakes and Clips
- Thermometer

-**CLOTHING**-
- Hardhat
- Gloves
- Neoprene Waders
- Rain Gear
- Sunglasses
- Watch

HABITAT DATA REQUIREMENTS
For Side Channels: Est. Length, Width, and Max. Depth (can also record wood as Forest option)
For Tributaries: Does not get SO. Record Bank Orientation (dwnstrm), % Contrib. to Flow, Grad., temp, time on blank line below SO where tributary enters.
For Dry Channel: Channel Length and Dom. Substrate (can also record wood as Forest Option)
For Special Cases: Fill out the Special Cases Form for Falls, Chutes, Marshlands, Dams, and Culverts
For Marshlands: Est. Length, Average Width, Dom. Substrate, Woody Debris, and Temp.

INDICATORS OF BANKFULL
Perennial Veg. End Point
Scour Points in Bank
Exposed Tree Roots
A Break in Slope / Change in Particle Size
High Point on Depositional Bars
Staining of Rocks

Bankfull Width to Depth Ratio (W:D) = bankfull width / average bankfull depth
Entrenchment Ratio (ER) = floodprone width / bankfull width

WOODY DEBRIS SIZE CLASSES

Eastside	**Westside**
Small = Diam. > 6 in. at 20 ft.	Small = Diam. >12 in. at 25 ft.
Medium = Diam. >12 in. at 35 ft	Medium = Diam. >24 in. at 50 ft.
Large = Diam. >20 in. at 35 ft.	Large = Diam. >36 in. at 50 ft

Exceptions

If wood does not meet the length requirements, but is longer than 2X the bankfull channel width, then count the piece in the appropriate size class based on minimum width criteria

- Woody Debris must be within bankfull width to be counted
- Diameters are measured at required length from large end

PLANT COMMUNITY CLASS CODES

NV = No vegetation
GF = Grasses and Forbs
SS = Seedling Shrub (1.0-4.9 in. dbh**)**
SP = Sapling/Pole (5.0 – 8.9” dbh**)**
ST = Small Tree (9.0 – 20.9” dbh)
LT = Large Tree (21.0 – 31.9” dbh)
MT = Monster Trees (>32.0” dbh)

APPENDIX F

TEST REACH CHECKLIST
And
Test Reach Summary

QA/QC Checklist for Test Reach, etc.

Team Members _____ Date_____

Habitat Dimensions	Status	Comments/Notes
Lengths		
Widths		
Depths		
Pool Tail Crests		

Channel Unit Calls	Status	Comments/Notes
Fast Water		
Slow Water		
Special Cases		
Side channels		
Tributaries		
Dry Channel		
Culverts		
Wood Size Diameters		
Wood Counts		
Appropriate wood classes		

Form Completion	Status	Comments/Notes
Good Notes		
Forms filled Out		
Forms Readable		
SO Sequencing Correct		

Pebble Counts	Status	Comments/Notes
Transects Done correctly		
Bankfull to Bankfull		
randomly selecting rocks		
at least 100 rocks		
Form filled out completely		
Understand procedures		

Bankfull and Floodprone Measurements	Status	Comments/Notes
Bankfull located properly		
Bankfull measured properly		
Bankfull depths measured properly		
Max bankfull depths measured properly		
Floodprone width measured properly		
Overall bankfull procedures understood		
Calculations for bankfull w/d ratio and entrenchment ratio done correctly		

Discharge	Status	Comments/Notes
Location		
Form Completed		
Calculations done Correctly		

Misc	Status	Comments/Notes

A ✓ in the **Status** column indicates the procedure was done correctly and to the satisfaction of the tester. A ✗ in the **Status** column indicates that the procedure needs work and was not done to the satisfaction of the tester.

TEST REACH SUMMARY

Range of Accuracy	Criteria	QA/QC Team	Team 1	Dev.	Team 2	Dev	Team 3	Dev.	Team 4	Dev.
±10%	Total Survey Length (ft)									
	# Channel Units									
	# Slow Water Units									
	Fast Water Length (ft)									
	Slow Water Length (ft)									
	Average Wetted Width (ft)									
±10%	Pools/Mile									
±10%	Pool/Riffle Ratio*									
±10%	Bankfull W/D Ratio									
±10%	Entrenchment Ratio									
±10%	D50									
Wood Tally ±25%	Small									
	Medium									
	Large									

Dev. = This is the % deviation compared with the QA/QC Team

***Pool/Riffle ratio is calculated using % slow water area divided by % fast water area**

APPENDIX G

QA/QC TEST
AND
FIELD EVALUATION FORM

STREAM INVENTORY QUALITY CONTROL QUIZ

1. The minimum sampling frequency of both fast water units and slow water units required for statistical validity is _____.

    a. 10 units per reach or 10% of each channel unit type, whichever is less.
    b. 10 slow water and 10 fast water units per stream or a 10% sampling of each habitat type, whichever sample size is greater.
    c. 10% of each habitat type.

2. What variables do you record at a side channel?

3. The Survey Form and Preliminary Reach Form should always be filled out before surveying because they offer the surveyor information on the following:

    a. Potential reach break locations.
    b. Past history.
    c. Access points.
    d. All of the above.

4. Where side channels (SIDE) enter the mainstem they are assigned the _____ SO from the channel unit they flow into.

    a. Same
    b. Next incrementally higher
    c. Doesn't matter

5. Pool crest depth is the <u>mean</u> depth across the point where the water surface slope of a pool breaks into the slope of the downstream unit. **T or F.**

6. You have taken all the bankfull and floodprone measurements at a measured fast water unit. You have to make a determination in the field for the Rosgen channel type. **T or F.**

7. What variables do you record at a dry channel?

8. In order to reduce chances of numbering errors, what columns should you fill out on the Channel Unit Form for a measured unit?

9. If access to a mile long stretch of private land is denied, you give the area a separate reach with one SO. **T or F**.

10. Which of the following indicators is least important in searching for the bankfull level along a stream bank?

    a. Changes in bank substrate particle size.
    b. The point at which annual vegetation ends.
    c. Undercut banks.
    d. Areas of bank scour.
    e. Scoured out and exposed tree roots.

11. Bankfull is defined as the high stream flow event occurring on average every _____ years.

    a. 5
    b. 2.5
    c. 1.5
    d. 100

12. Two stream surveyors are surveying a fast water habitat unit. They observed three pieces of wood in the unit of varying lengths. The bankfull width of the stream is 20 feet wide. PICK ONE ANSWER BELOW FOR EACH OF THE PIECES OF WOOD.
    a. Small-sized wood
    b. Medium-sized wood
    c. Large-sized wood

    Write the correct wood classes in the space provided for each piece of wood for the westside:

    38” x 52’ _____
    25” x 38’ _____
    12” x 40’ _____

13. Using the Region 6 eastside guidelines for categorizing large and medium-sized woody debris, the width criteria refers to the diameter 50 feet up the log from the base of the tree. **T or F**.

14. When a downed and completely uprooted tree (root swell and bole are within bankfull) of 40” diameter x 60’ long spans the 25 foot wide channel and rests on the opposite bank above the water surface, using westside criteria, we refer to it as:

    a. Large-sized, in-channel wood.
    b. Uncounted wood.
    c. Small-sized, in-channel wood.

15. Wood is counted only when it is within the _____.

    a. Wetted width.
    b. Bankfull width.
    c. Area that would be beneficial to the riparian zone.

16. If you had a 10% pool sampling frequency and randomly selected the number 7 as the sampling start point, the following slow water channel units have paired measurements:

    a. 10, 20, 30, etc.
    b. 7,17,27, etc.
    c. 1, 7, 14, etc.

17. What must you do when changing your sampling frequency:

    a. End your current reach.
    b. Count the number of units measured to that point.
    c. Conduct random starts to determine your next measured units.
    d. Roll dice in order to chose a new frequency.

18. Why should the recorder not tell the estimator of an upcoming measured unit?

19. Additional information, more than that provided on the Channel Unit Form, is required for falls, chutes, marshes, culverts, and dams (fill out _____Form).

20. If the flow of your stream is dwindling and you anticipate it drying up within a ¼ mile, and you have measured only 6 slow water units; you want to (increase or decrease) your sampling frequency from the original 10% for pools and conduct a _____ in order to assure that no bias was introduced in choosing the first pool to be measured upstream of that point.

21. It is possible to change the estimator midway through a reach as long as you conduct a random start. **T or F**.

22. A surveyor breaks one long fast water units into two shorter fast water units. Do the two shorter fast water units get the same SO? **Y or N**.

23. When measuring the width of the habitat – you should measure :

    a. Widest wetted width.
    b. Bankfull width.
    c. Average wetted width

24. Two stream surveyors were surveying. At the end of the surveyed stream they reviewed their estimated and measured lengths. Below is the data:

	Est.	Measured
Observer #1	20	30
	55	44
	24	35
	80	71
Observer #2	25	40
	37	54
	82	95
	35	48

Observer #1 has a correction factor of 1.0 and observer #2 has a correction factor of 1.3. Which data has greater validity?

a. Observer #1
b. Observer #2

Why?

25. The Final Reach Form should be completed:

    a. After each Reach is surveyed.
    b. At the end of the stream survey.
    c. End of the season.

26. River miles:

    a. Are determined in the office.
    b. Start at 0.0 miles and begin at the stream mouth.
    c. Start at 0.0 miles and begin at the point where the stream survey begins.
    d. A and B
    e. A and C

27. In order to consider a channel unit as a unit for the R6 Level II survey:

    a. The channel unit must be at least 20 feet long.
    b. The channel unit length must be 4 times greater than the habitat width.
    c. The channel unit wetted length must be greater than the wetted width (except for plunge pools).

28. The width of a dry MAIN channel should be measured:

    a. At the wetted width marks.
    b. Where the vegetation starts.
    c. Record as 0; measure only length.

29. The percentage (%) of flow a tributary contributes to the mainstem is not important and should not be recorded on the comment form. **T or F**.

30. Bankfull width and depth measurements are taken at the following channel unit types:

    a. Fast Water Units
    b. Slow Water Units
    c. Measured fast water units only
    d. Measured slow water units only

31. The measured fast water unit you are on does not have clear bankfull indicators, what do you do?

32. Reach 1 of your stream is 0.7 miles long. The elevation at the mouth was 2200 feet and the elevation at the end of the reach was 2390 feet. Calculate the gradient for the reach.

33. What data is collected on a dry side channel?

    a. Length and width.
    b. Substrate
    c. None, data is not collected on dry side channels.

Evaluation Form for Field Visits

Observer: _____ **Recorder:** _____

Date of Field Visit: _____

Location of Field Visit: _____

Evaluator: _____

SURVEY PROCEDURES				
Procedure Item	**Prepared**	**Completeness**	**Skill/Knowledge**	**Other**
General Survey Procedures				
--Channel Unit Typing				
--Special Cases				
--Reach Changes				
--Equip. Use				
--Note Taking				
General Morphology Procedures				
Pebble Count Procedures				

SAFETY				
Item	**Recognized Hazards for that Day**	**Took Precautionary Measures to Avoid Hazards**	**Dealt with Incidents in a Safe Manner**	**Other**
Driving Safety				
Hiking Safety				
In-Stream Safety				

Comments:_____

_____

_____

_____

_____

_____

_____

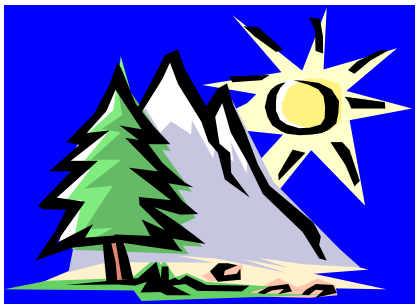
_____

Use a 1-3 rating. 1 = did not meet expectations, 2 = met expectations, 3 = exceeded expectations

APPENDIX H

POST SURVEY CHECKLIST

Post Survey Checklist



- ❑ Check all SO's and channel unit types to make sure numbers are right, correct if necessary
- ❑ Make sure all numbers from Channel Unit Form correspond to the Special Cases and Remarks forms.
- ❑ Complete Final Reach Form
- ❑ Give all forms to data entry person
- ❑ Survey Map completed
- ❑ _____
- ❑ _____
- ❑ _____
- ❑ _____

APPENDIX I

NRIS AI/AB Data Entry Guide
for
Region 6 Stream Inventory Data

NRIS AI/AB Data Entry Guide
for
Pacific Northwest Stream Inventory Data

DRAFT

March 2005

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Region 6 Stream Inventory Quality Control Coordinator

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Purpose of the Guide

This guide is intended to assist the user who is entering R6 Level II Stream Inventory Data. It will provide step-by-step instructions specific to R6 stream and biota data. This guide will hopefully answer those questions the user will have specifically regarding what to do with R6 stream data. The data entry process consists of 4 steps:

1- Create your survey segments in Arcview
2- Enter data describing the survey (where, when, how). (Survey Tab)
3- Enter specific data about the survey (reach). (Reach Tab)
4- Enter the specific channel units for the survey. (Channel Unit Tab)

Commonly used Acronyms

NRIS – Natural Resource Information System
AI – Aquatic Inventory Module
AB – Aquatic Biota Module
R6 – Region 6
LLID – Latitude, Longitude Identifier

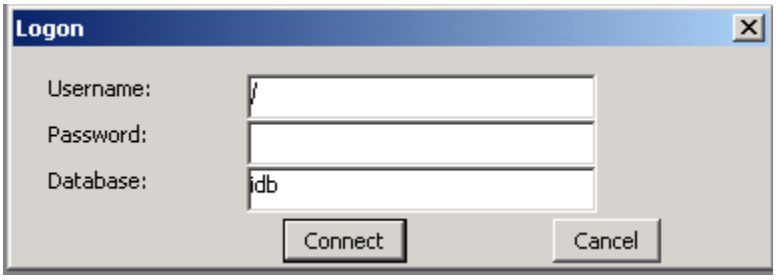
THE RIGHT STUFF

Before entering a survey it is a good idea to have all the forms and maps you will need to create your segments and enter your data. The process will go much smoother by having good maps (1:24,000 USGS quads) with the reach breaks already identified on them. All required fields should be filled out and all the sequence orders corrected if needed.

LOGGING IN

This guide assumes you have NRIS Water loaded on your computer and you have edit access. If not please contact the NRIS Helpdesk (541-750-7100).

Log into NRIS Water by going to Start → Forest Service → NRIS → Water → Water v1.1.1. This will bring up the following Logon screen. Enter the fields as seen below. No password is needed if the appropriate roles have been granted.



WATERSHED TREE

You will be taken to a screen with all the HUC's for your Forest after logging in. Navigate to the appropriate Watershed using the Find option or scrolling through the HUC's. Once you find the watershed where your stream is located click on the Aquatic Inventory button to take you to the next screen.

GIS Phase

NRIS Water connects several coverages from your forest into the ARCVIEW program integrated into AI. If you need to obtain other coverages or you know there are other coverages available you can add these to assist you in locating your reaches. Contact your GIS person for the pathway to these coverages on your home network system.

You will first need to create segments representing your reaches (surveys) in ArcView. Survey maps and the Final Reach Form are essential to have during this phase to accurately locate your segments. NRIS AI treats each Reach/Ecoreach as a survey. Each survey can have only one LLID.

When locating reaches in GIS the program will prompt you to designate a survey as a Reach, Ecoreach, or Valley Segment (Step #21 in procedure below). For R6 Protocol you will designate it as the following:

ECOREACH if it was physically surveyed and broken out based on geomorphology. It has defined ecological and physical characteristics (e.g., A survey starts at the mouth of the stream where there is a wide open floodplain, Rosgen C channel, then changes to a higher gradient, riffle dominated reach, Rosgen B channel, and the reach is broken, this is designated as an ECOREACH).

REACH if the starting and/or ending points were chosen due to private land or based on Forest service boundaries, etc., <u>NOT</u> on geomorphology. This is a discretionary reach, defined by physical extents, but not necessarily having defined ecological and physical characteristics.

Segment (Reach) ID

⇒ The ecoreaches/reaches will be named simply with a number (1,2,3, etc.) sequentially moving upstream (Step #20 in procedure below) along with the Beginning Index Point (i.e., starting River Mile of the reach). If a stream survey is repeated over the years and the same reaches are broken out with the same river miles use the same reach segment from the previous year. The segment will be identified by the year and protocol chosen on the Survey Tab. If the reaches do not exactly correspond to a previous survey but the reaches overlap create a new segment in Arcview then designate with the letter 'a' to indicate the reach overlaps. See example below of 2 surveys from different years on the same stream:

Reach Example	Segment ID	Comments
Reach 1 1999 0.0 to 2.5	01-0.0	0.0 is the beginning of the reach
Reach 2 1999 2.5 to 5.0	02-2.5	
Reach 1 2004 0.0 to 2.8	01a-0.0	The 'a' indicates overlap with the 1999 survey
Reach 2 2004 2.8 to 5.1	02-2.8	You do not need the 'a' because the From point is different

Do NOT place years or any other descriptors here. It is unnecessary and each survey will be identified with the year on the survey tab.

How to Create New Segments

This section contains the step-by-step directions for creating new stream segments. The steps vary slightly depending on how the user wants to begin. The user chooses one of the following case situations:

> **Case 1 – Uses GIS Display**: The stream name is known; user selects the stream on the form.
> **Case 2 – Uses GIS Query**: The stream name is not known or not found; user selects the stream on a map in ArcView.

WARNING: **If you are using a Windows 2000 PC, ArcView may open behind the Oracle forms. If this occurs, click on the flashing blue button on the task bar at the bottom of the screen to bring the ArcView session to the top.**

Creating Stream Segments and Points
Stream segments and points can be created from within any NRIS Water submodule.

Creating New Stream Segments

Case 1: The stream name is known; user selects the stream on the form.

1a. **From AI Survey or AB Streams form:** • Select a Stream Name	1b. **From the Location form:** • Click on Stream Seg. tab • Select a Stream Name
2. Click the GIS Display icon , which launches ArcView. The stream is highlighted. **NOTE:** If the highlighted stream is not the one you want, either select the stream you want using the Select Feature icon or go to Case 2.	
3. **OPTIONAL:** To add another theme(s) to view (e.g. roads or waterbodies) • Click on NRIS Water on the menu bar • Click Add Themes to ArcView View • Select another theme(s) and click *OK*	
4. Click the Zoom To Selected icon to view highlighted stream (if needed).	
5. Click the Zoom In icon . Zoom in on the area of interest by clicking and dragging the mouse to create a box around the area of interest. (For best results, repeat this step to zoom to a scale of 1: 10,000 or larger. The scale is located at the top right corner of the ArcView screen in the tool bar.)	
6. Click on NRIS Water from the menu bar.	
7. Click on Creation Tools (window opens).	
8. Select Create Stream Segments. Click *OK* (window opens).	

9. Click *OK* after reading the Event Creation in 2 Steps message. (Cursor will change to a circle with a dot in the middle and the blue <In> icon appears on the button bar.)
10. Click the beginning point of the stream segment on the selected stream (window opens).
11. If the Confluence Found message box appears indicating a confluence nearby: • Click *YES* to place the point on the confluence • Click *NO* to keep the point where you clicked
12. At the Characteristics of the Point message box: • Click *YES* to keep the point • Click *NO* to delete the point and try again
13. Click the ending point of the stream segment on the selected stream (window opens).
14. If the Confluence Found message box appears indicating a confluence nearby: • Click *YES* to place the point on the confluence • Click *NO* to keep the point where you clicked
15. At the Characteristics of the Point message box: • Click *YES* to keep the point • Click *NO* to delete the point and try again
16. **OPTIONAL:** If you have segments that are continuous (i.e. the end point for one is the begin point for the next), repeat Steps 13 – 15 to create multiple segments.
17. Click the blue <In> icon on the button bar (window opens).
18. At the Insert Highlighted Flashing Segment message box: • Click *YES* to insert segment into database (window opens) • Click *NO* to cancel creation of the segment
19. Click *OK* at the Insert message box (window opens).
20. Type in the name you want for the segment. See pg 4 for more information. Click *OK* (window opens).
21. Select the segment type. See pg 4 for more information. Click *OK* (window opens).
22. **OPTIONAL:** If multiple segments were created, you will be asked to repeat Steps 18 – 21 for each segment.
23. At the New Segment Display message box, click *YES* to view the new segment(s) and segment name(s) on screen. Note that the segment exists in the database even if not displayed on the screen.
24. Click the Return to Form icon.
25. Click in the Segment ID field.
26. Click the Execute Query icon.
27. The new segment(s) should be listed, although you may have to scroll down to find it. **NOTE:** If the segment does not appear, make sure you are on the correct tab, stream, and HUC in the Streams block. You may have created the segment on the same stream in another HUC.

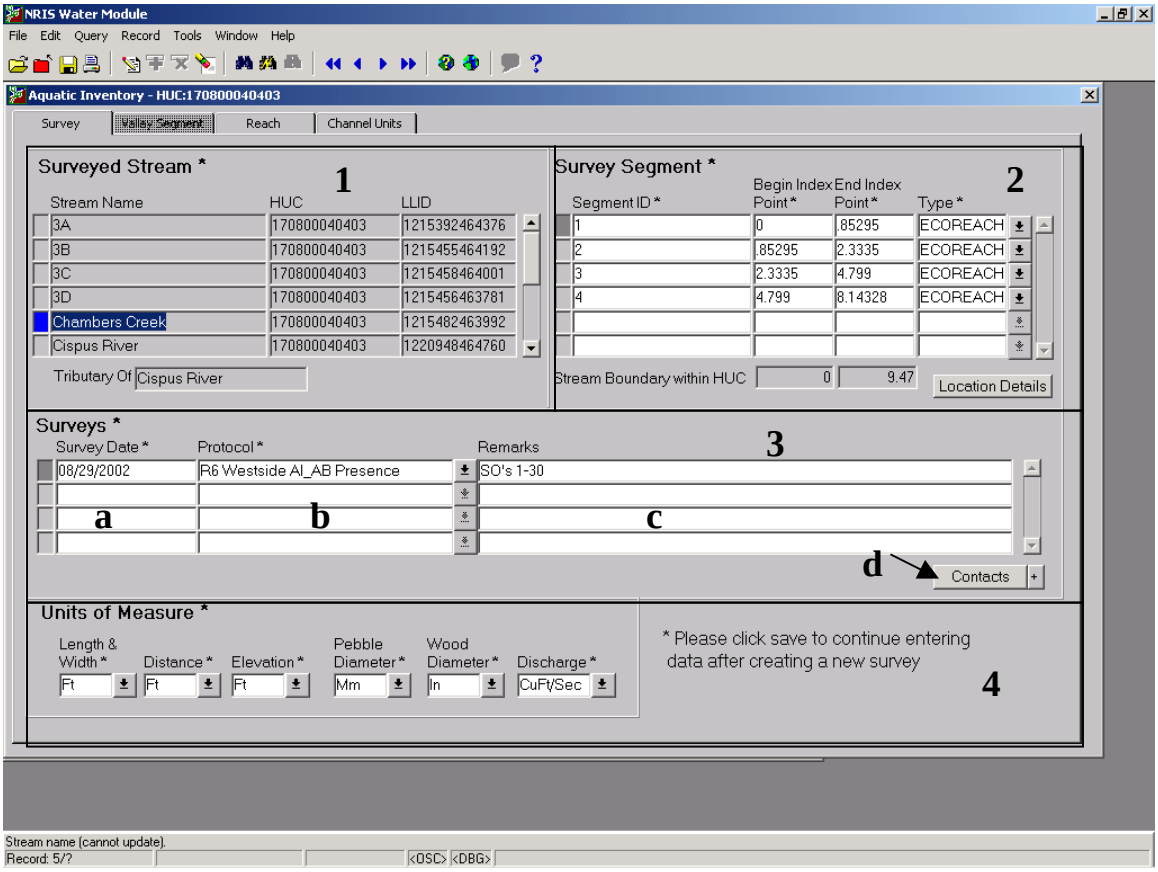
Case 2: The stream name is not known or not found; user selects the stream on a map in ArcView.

1a. **From AI Survey or AB Streams form:** • Click in the Stream Name field (it does not matter which stream you select)	1b. **From the Location form:** • Click on Stream Seg. tab • Click in the Streams block (it does not matter which stream you select)
2. Click the GIS Query icon which launches ArcView.	
3. **OPTIONAL:** To add another theme(s) to view (e.g. roads or waterbodies) • Click on NRIS Water from menu bar • Click Add Themes to ArcView View • Select another theme(s) and click *OK*	
4. Click the Zoom In icon . Zoom in on the area of interest by clicking and dragging the mouse to create a box around the area of interest. (For best results, repeat this step to zoom to a scale of 1: 10,000 or larger. The scale is located at the top right corner of the ArcView screen.)	
5. Click the Select Feature icon .	
6. Click the stream of interest. It will highlight.	
7. Click on NRIS Water from the menu bar.	
8. Click on Creation Tools (window opens).	
9. Select Create Stream Segments. Click *OK* (window opens).	
10. Click *OK* after reading the Event Creation in 2 Steps message. (Cursor will change to a circle with a dot in the middle and the blue <In> icon appears on the button bar).	
11. Click the beginning point of the stream segment on the selected stream (window opens).	
12. If the Confluence Found message box appears indicating a confluence nearby: • Click *YES* to place the point on the confluence • Click *NO* to keep point at location where you clicked	
13. At the Characteristics of the Point message box: • Click *YES* to keep the point • Click *NO* to delete the point and try again	
14. Click the ending point of the stream segment on the selected stream (window opens).	
15. If the Confluence Found message box appears indicating a confluence nearby: • Click *YES* to place the point on the confluence • Click *NO* to keep point at location where you clicked	
16. At the Characteristics of the Point message box: • Click *YES* to keep the point • Click *NO* to delete the point and try again	

17. **OPTIONAL:** If you have segments that are continuous (i.e. the end point for one is the begin point for the next), repeat steps 14 – 16 to create multiple segments.
18. Click the blue <In> icon on button bar (window opens).
19. At the Insert Highlighted Flashing Segment message box: • Click *YES* to insert segment into database (window opens) • Click *NO* to cancel creation of the segment
20. Click *OK* at the Insert message box (window opens).
21. Type in the name you want for the segment. See pg 4 for more information. Click *OK* (window opens).
22. Select the segment type. See pg 4 for more information. Click *OK* (window opens).
23. **OPTIONAL:** If multiple segments were created, you will be asked to repeat steps 19 – 22 for each segment.
24. At the New Segment Display message box, click *YES* to view the new segment(s) and segment name(s) on screen. Note that the segment exists in the database even if not displayed on the screen.
25. Click the Return to Form icon .
26. Click in the Segment ID field.
27. Click the Execute Query icon .
28. The new segment(s) should be listed, although you may have to scroll down to find it. **NOTE:** If the segment does not appear, make sure you are on the correct tab, stream, and HUC in the Streams block. You may have created the segment on the same stream in another HUC.

Information Relating to R6 Data Entry by Form/Tab

SURVEY TAB



1. **Surveyed Stream** – All the fields in this block are grayed out which means these fields are not available for editing.
2. **Survey Segment** – The fields in this box will be populated when the segments are identified in ArcView. The reaches should be identified as described on pages 4 and 5. The mileages can be changed here if needed. If your beginning and ending points are not continuous for each survey done on a stream in a year (maybe a private section or inaccessible area was not surveyed) please indicate this in the remarks but DO NOT enter it in as a separate survey.
3. **Surveys**
    a. Survey Date – This is the start date of the survey. Each Reach is considered a separate survey in NRIS AI.
    b. Protocol – Choose the protocol that best fits your area and your biota surveys. Four protocols are available. ***Choose carefully** – Once you enter data into the survey you will NOT be able to change the protocol. If you are entering old Stream Inventory data you will find Pre96 protocols available. For current surveys using the new channel unit types (2001 and newer) use the following protocols:

R6 Westside AI_AB Presence – Westside forest, with the biota surveys done using presence only, Streams located west of the Cascade divide.
R6 Eastside AI_AB Presence – Eastside forest, stream survey with the biota surveys done using presence only. Streams located east of the Cascade divide.
R6 Westside AI_AB Count – Westside forest, stream survey with the biota surveys done counting fish. Streams located west of the Cascade divide.
R6 Eastside AI_AB Count – Eastside forest, stream survey with the biota surveys done counting fish. Streams located east of the Cascade divide.

c. Remarks – It is recommended that the SO's that belong in this reach are put in this block. Information specific to the reach can also be entered here.
d. Contacts – This is the location to enter names of the recorder and observers who collected the stream inventory data. It is a good idea to enter all the contacts that may have worked on surveys the first time you enter data.

Directions for Adding Contacts
Click on the Contact, Right click while your cursor is in the field below Contact Name, Choose Maintain Persons, Click on the green plus icon to create an empty line. Enter the last and first name as a minimum (Do not enter anything into the Expertise Type Area). Save. That person is now available in your pulldown list.

Attaching Contact to Survey
Put cursor in blank line, go to pulldown menu and choose appropriate person, click pulldown under Participation and choose appropriate code. Click OK and person is added. There will now be a + sign next to Contacts to indicate there are contacts attached to that survey.

4. **Units of Measure –** Choose the following unit of measure for each of the following:

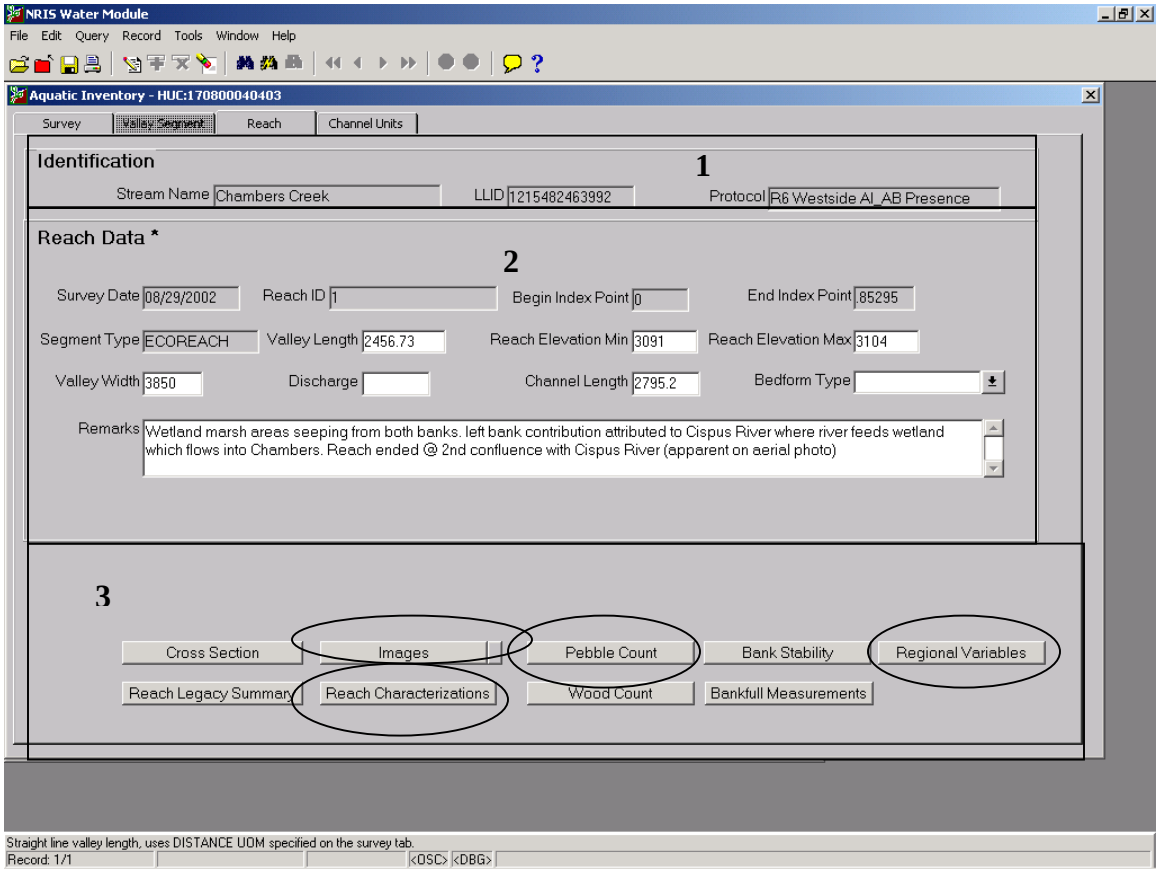
Length & Width – Feet (Ft)
Distance – Feet (Ft)
Elevation – Feet (Ft)
Pebble Diameter – millimeters (Mm)
Wood Diameter – Inches (In)
Discharge – CFS (CuFt/Sec)

You must save before the Reach and Channel Unit tabs become available. Move on to the Reach Tab.

REACH TAB

The following fields under the Reach tab are <u>R6 Required Fields</u>: Valley Length (feet), Reach Elevation Min (feet), Reach Elevation Max (feet), Valley Width (feet), Discharge (CFS, for First Reach only), Channel Length (feet).

Fish Sampling Method – The reach tab will be the location where you will identify the method of fish sampling you used for the survey. With the cursor in the "Remarks" block, click on the yellow additional Comments icon ( ) and in the pull down menu under "Subject" choose AB_SAMPLING_METHOD (part of the last word will not be visible), in the "Comment Text Box" type in the method of sampling used (e.g., – snorkeling, electroshocking, etc.). If a different method was used in a certain channel unit identify this at the channel unit level in the AB screen.



1. **Identification –** These are automatically filled in from the previously entered information.

2. **Reach Data**

   Valley Length (R6 Required) – Length of the valley in feet measured off of a 1:24000 quad map.

   Reach Elevation Max (R6 Required) – Maximum elevation for the reach in feet.

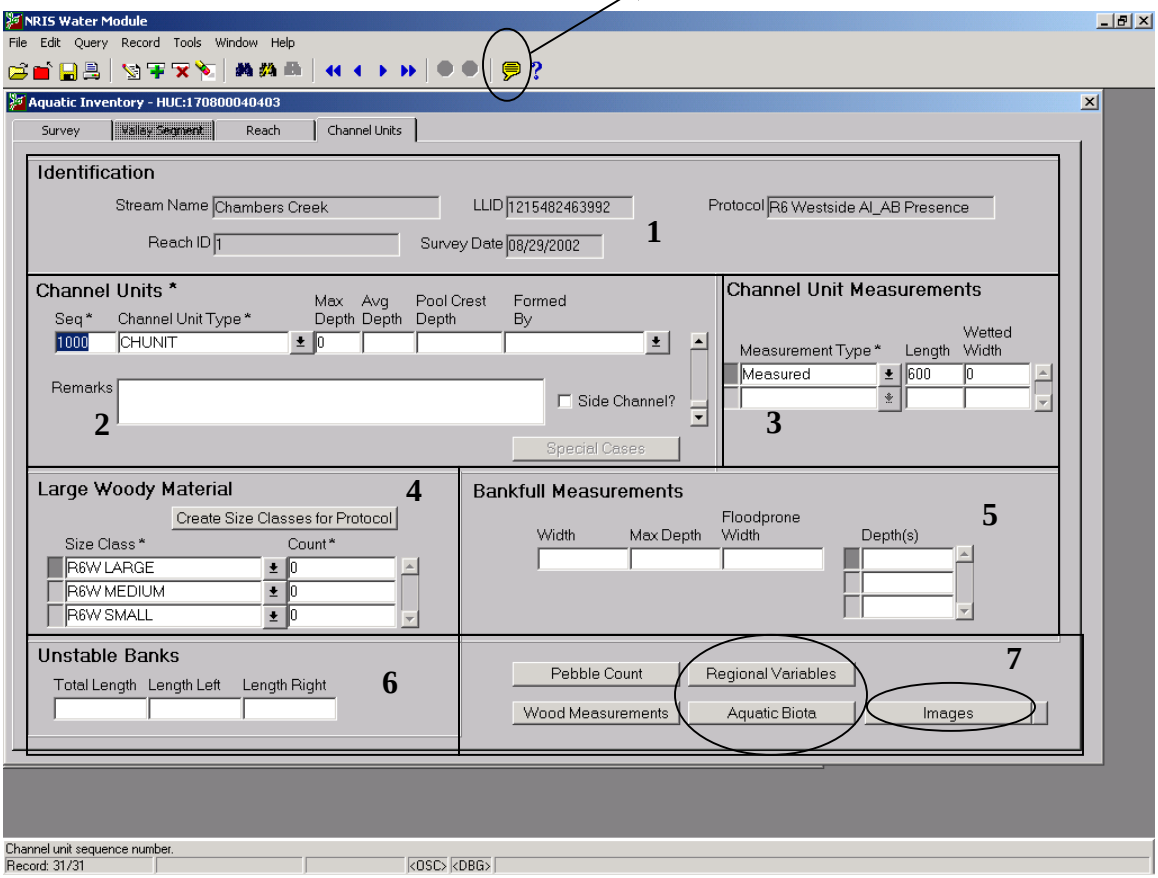
Reach Elevation Min (R6 Required) – Minimum elevation for the reach in feet.
Valley Width (R6 Required) – Average width of the valley in feet (Map Estimated).
Discharge (R6 Required in first reach only) – Flow measured at the beginning of the survey in cubic feet per second (cfs)
Channel Length (R6 Required) – Length of channel in feet for reach measured off the USGS 1:24000 quad map.
Remarks – General information about the reach can be entered here.

3. **The Buttons –** Regarding R6 Level II Stream Inventory data only 4 of these buttons will be utilized. (Migrated gradient data will be migrated to the **Cross Section** button. If older data were entered the gradient would also be entered in this location).

Pebble Count data will be entered here under the pebble count button.
Reach Characterizations is the location to enter the Rosgen Channel Type.
Regional Variables also need to be entered. See Regional Variable section on pg. 21 for more information.
Images – Photos that represent the reach can be attached here on the local server so all users will be able to view them (See pg. 30 for instructions).

CHANNEL UNIT TAB

Use for tributaries, culverts, and special cases



**Before beginning data entry it is recommended that you identify your reach breaks on your datasheets with a bright highlighter line to ensure the correct sequence order numbers get into the correct reaches. If you find that you entered data into the wrong reach, contact the NRIS Helpdesk.

1. Identification

The data in this block are grayed out which indicates that the data cannot be edited. This information was brought forward from the previously entered data.

2. Channel Units

Entering and Editing Channel Units in the Channel Units Block

Entering a new Channel Unit:
To enter a new Channel Unit you MUST be on a blank line **in the Channel Unit block in the Seq. field**. There are 3 ways to get to a blank line:

1. Click the Insert icon (green plus sign) on below the menu bar.
2. Click the down arrow on your keyboard.
3. Click the Next Record icon (blue arrow pointing to the right). This works only if you happen to be on the last channel unit entered in your list.

DO NOT TYPE OVER A SEQ NUMBER to enter a new record. Oracle interprets that as editing the record, not entering a new record.

Accidentally typing over a SEQ Number:
If you accidentally type over a SEQ Number thinking you are entering a new record, here's what to do.

1. A message may appear that says "This sequence has been entered, please select another" when you go to enter a channel unit type. Click OK to the message.
2. Immediately, Click the Clear Record icon (icon looks like a pencil with an eraser). This will clear the entry you made. This only works if you have NOT saved yet.

Then proceed with one of the three options above for entering a new record.

If you have saved your data already you have lost your previous data. The database would act as if you were editing that channel unit.

NRIS AI will NOT prompt you to move to the next reach after you have entered your last SO for the reach. Be aware of where your reach ends in order to get your SO's in the proper reaches.

Channel Unit Type

Below you will find the codes that will be most applicable to R6 data. You can use the pulldown menu in NRIS to locate your channel type. **TIP**: You can also type in the beginning letters of a channel unit to get a smaller list. If you go to a higher level of identification for your channel unit codes a crosswalk table for the 3rd level codes can be found on pg. 38.

Crosswalk table for R6 Codes to AI channel unit codes.

R6 Channel Unit Code	NRIS AI Code
SIDES	SLOW (click side channel box)
SIDEF	FAST (click side channel box)
S	SLOW
SD	DAM_PL
SS	SCOURPL
F	FAST
FT	TURB
FN	NONTURB
CHUNIT/CHUNITM (MARSHLAND)	CHUNIT – Marshland in Comment
ARTIF	ARTIFIC (Use comment field to indicate culvert or dam)
WF	WTRFALL
CH	CHUTE
CHUNIT/ND/D (DRY CHANNEL)	CHUNIT – Dry Channel in Comment

Side channels (SIDEF or SIDES)
This channel unit is divided out as either a fast or slow water unit. In AI choose FAST or SLOW, then enter the data. MAKE SURE TO CHECK OFF THE SIDE CHANNEL BOX.

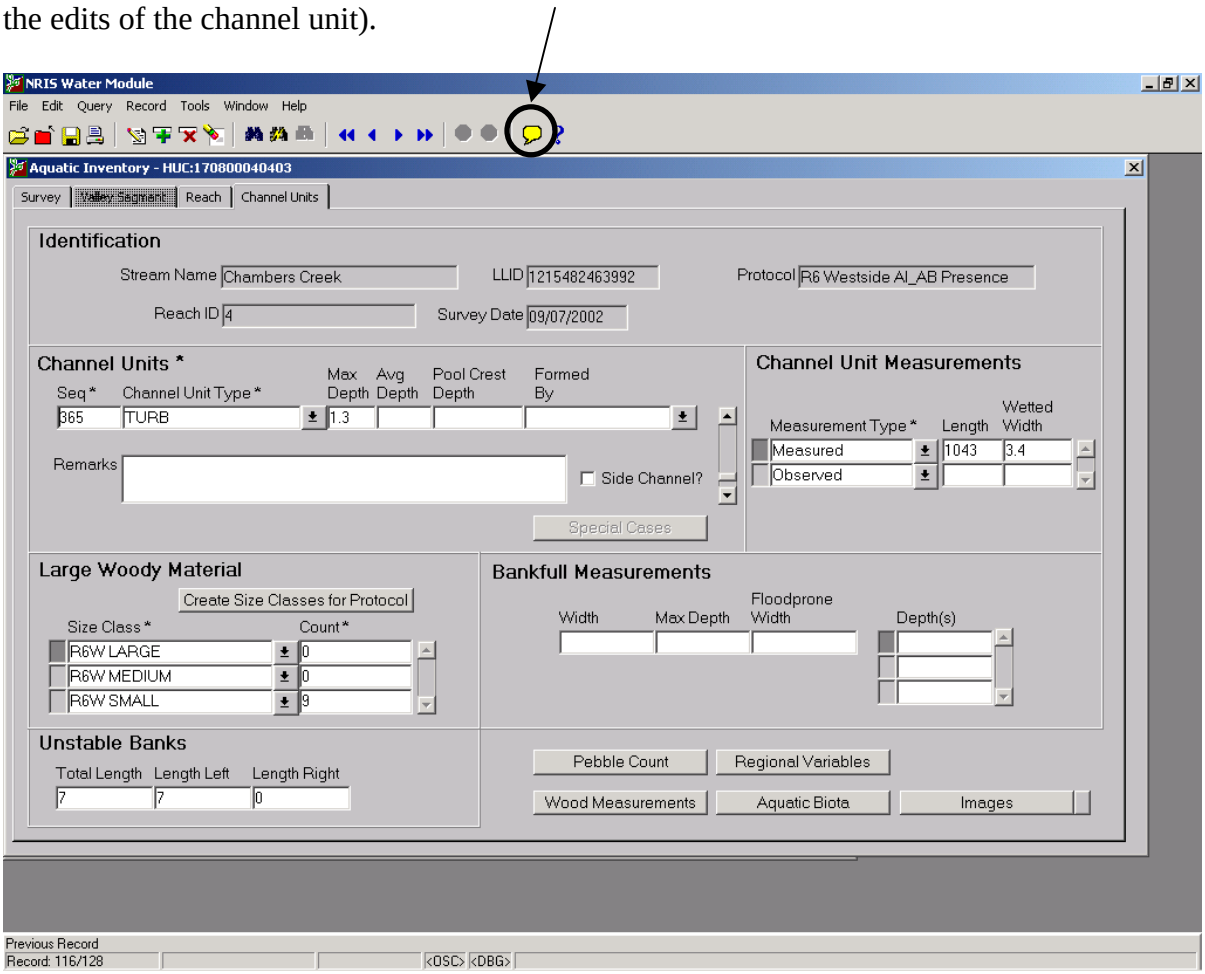
Tributaries
These do not get a specific channel unit. The information for the tributary will be entered into a comment box (the yellow Additional Comments icon on the tool bar at the top, this becomes available after you save the edits of the channel unit). Add this data at the channel unit where the tributary enters. Follow instructions as above to enter into the Comments box. Under subject in the pulldown menu choose HABITAT_TYPE_TRIB (Part of this title will be cut off). In the comment text box enter at a minimum the following information:

- Bank orientation
- Temperature
- Time of temperature
- Gradient, flow contribution to mainstem
- Access to fish
- Tributary name (if it is named on map)

It is recommended that something be typed in the remarks box of the channel unit to indicate there is information for the tributary in the comment box, such as “trib”.

Special Cases (Culverts, Dams, Marshlands), and Dry Channels
(See crosswalk table on pg. 15 for corresponding channel unit type)

Additional information for these channel units is entered into a comment box (the yellow Additional Comments icon on the tool bar at the top, this becomes available after you save the edits of the channel unit).

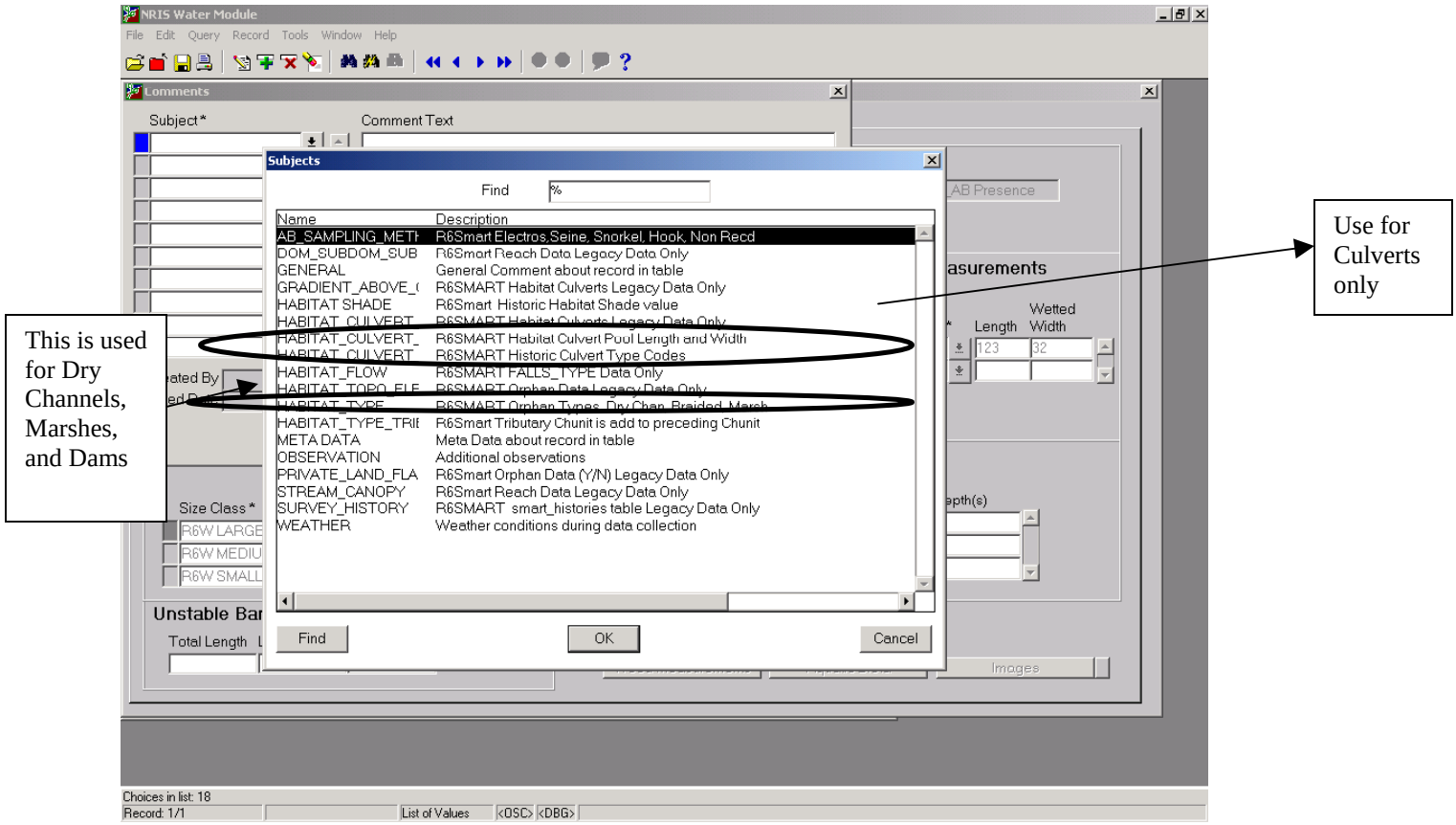


<u>IMPORTANT</u>** – Before clicking the yellow additional Comments icon, make sure your cursor is either in the Seq or Channel Unit Type field. This will ensure that the comment gets attached to the channel unit.

Special Cases and Dry Channels

When the yellow additional comment icon is clicked a separate box appears. In the subject area choose HABITAT_TYPE (R6SMART Orphan Types) for manmade dams, marshes, braids, and dry channels.

- Indicate the type of channel unit or special case it is in the comment text box along with any other pertinent information pertaining to the channel unit such as width of dams.



Once comments have been entered into this area the yellow bubble will appear to have writing in it ( ).

Culverts

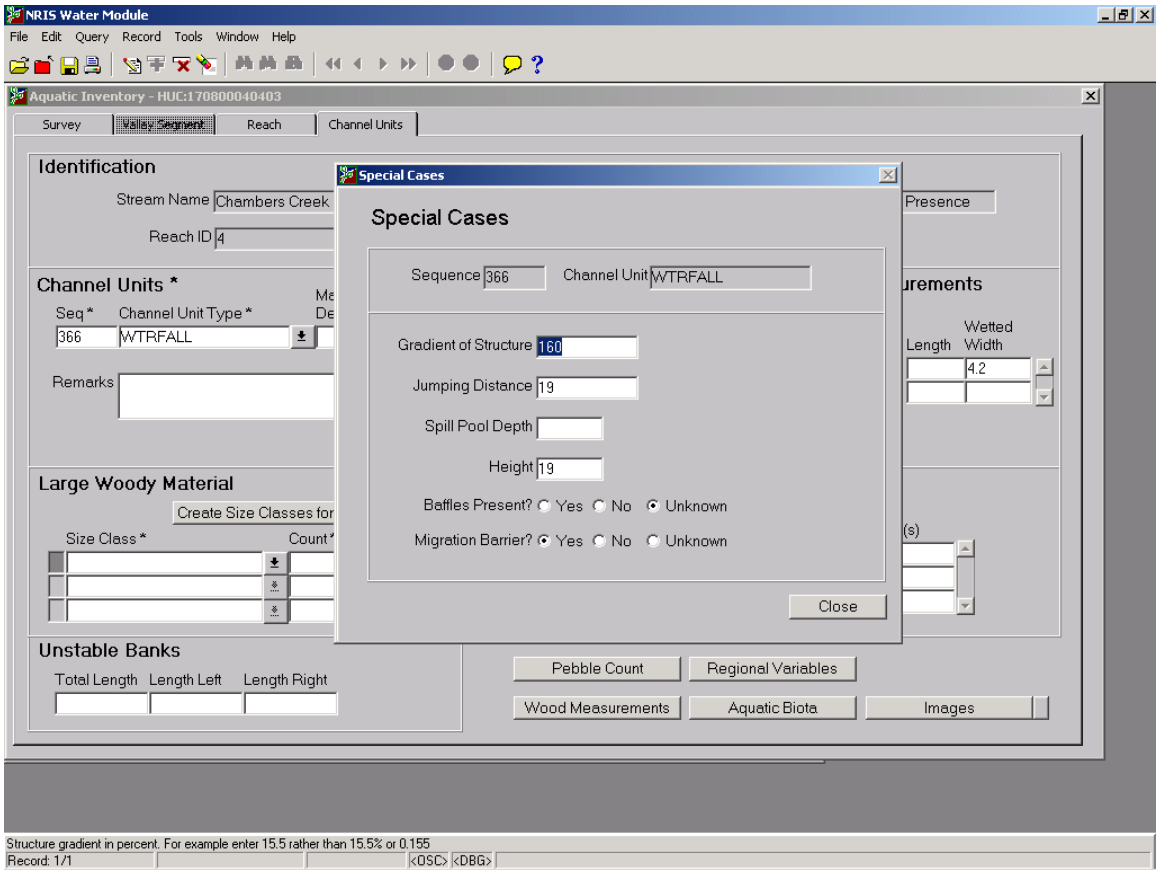
Choose the yellow additional comment icon. Choose the following names and enter the appropriate information in the comment text box (Parts of the name are not visible, Use the NAME and the Description to choose the correct Subjects – see screen shot above)

a. HABITAT_CULVERT_TYPE (R6SMART Historic Culvert Type Codes) – **Comment Text:** Indicate the culvert type (open arch, round pipe, etc.)
b. HABITAT_CULVERT_POOLS (R6SMART Habitat Culvert Pool Length and Width) – **Comment Text:** Enter the length and width of the pool below the culvert if one is present. If one is not present enter "No pool below culvert".

Channel Units (cont.)

Max Depth – Required on all main channel wetted units
Avg. Depth – Forest option
Pool Crest Depth – Required on Slow water units
Formed By – Forest Option
Remarks – Enter any pertinent information regarding that specific channel unit.
Side Channel? – If the channel unit is a side channel click on this box. The channel unit type should be identified as either a fast or slow water unit in accordance with the R6 Stream Inventory Protocol. **NOTE:** Remember to change the Measurement Type to Observed if the side channel was not measured.
Special Cases – This box will become highlighted if a listed channel unit is chosen and you have saved (see screen shot below).

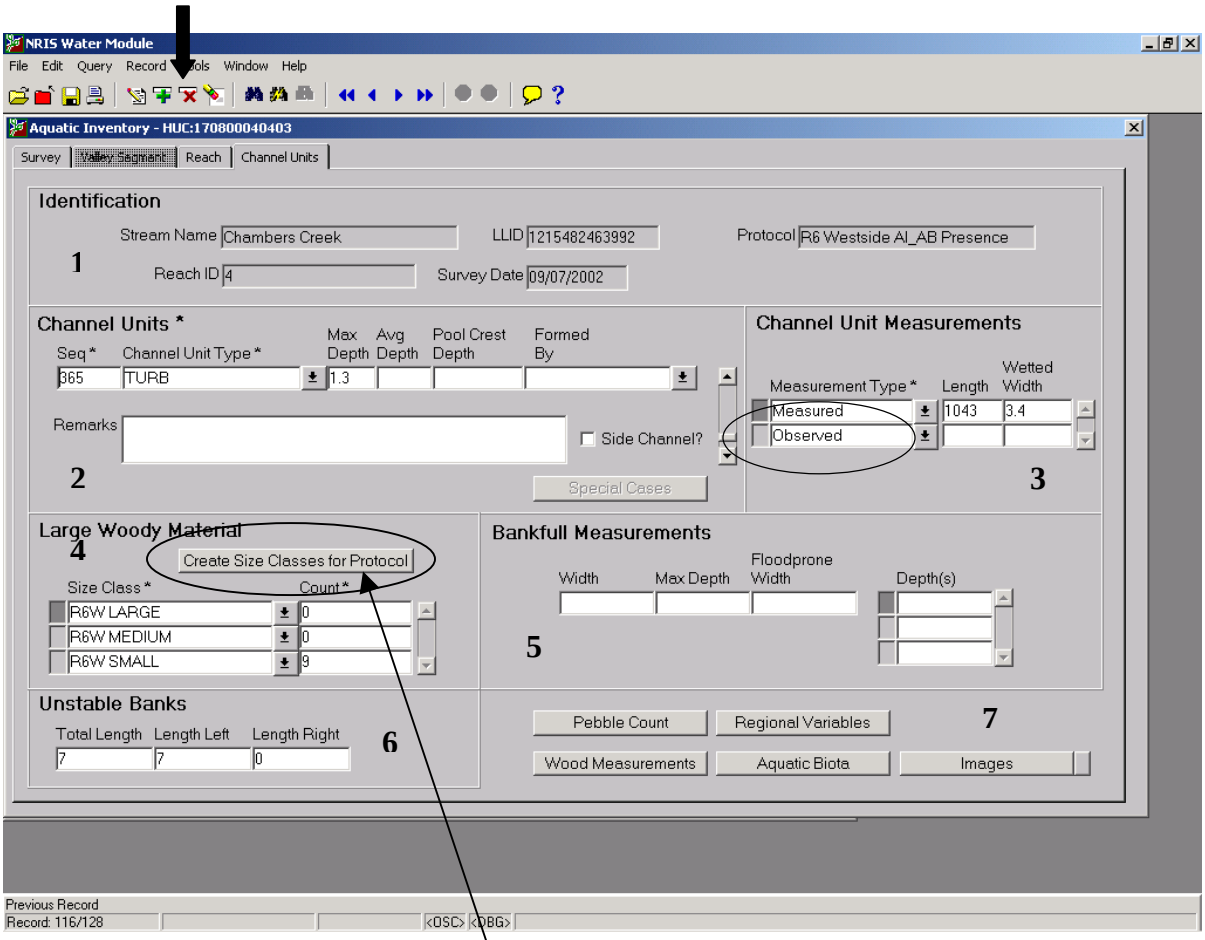
ARTIFIC – Manmade dam or culvert (see pg. 16 and 17)
WTRFALL – Enter data into Special Cases area and also enter wetted width under Channel Unit Measurements
CHUTE – Same as waterfall but also enter length and wetted width of channel unit
CASCADE – Same as CHUTE
BVRDAM – Enter same info as manmade dam.



3. Channel Unit Measurement

Measured vs. Observed Lengths and Widths

If a unit has only measured length and width data, do NOT leave a blank line with observed in the Measurement Type (see example below). This will have a negative effect on some of the queries run in the NRIS Access Tool. If this happens, delete the line by placing the cursor on the Observed line and click the red X on the toolbar. Save and put cursor in the Seq. field and create a new sequence.



4. Large Woody Material

ALWAYS click the <u>Create Size Classes for Protocol</u> button even if no wood was found. It will fill in automatically with 0's. You can then change the numbers to reflect your count. This field must be filled in. Do not leave woody material blank as it will affect the woody debris query in the NRIS Access Tool.

5. Bankfull Measurements

This information is filled in on measured fast water units only. If bankfull indicators are not present on the measured channel unit, type in a remark stating that fact and enter the bankfull data in the actual channel unit where the measurements were taken.

6. Unstable Banks

Enter the Total (left and right bank numbers must add up to the total) unstable banks observed within that channel unit. If you collect this data only on measured units do not enter anything on unmeasured units. If you are collecting unstable banks for the entire survey make sure to enter 0's into the fields if no unstable banks were observed along with your other measurements.

7. The Buttons

Three of these buttons will be utilized for the R6 Stream Inventory: Regional Variables (see pg. 21), Aquatic Biota (see pg 22), and Images (see pg 30).

Regional Variables

Regional Variables can be found on the Reach and Channel Unit Tabs. The button is in the lower right hand corner. The table below describes the Regional Variables for each Tab/Form and describes the required format for entering the data.

The formatting of the regional variables can also be found in the database by clicking on TOOLS → SYS ADMIN → SITE PREFERENCES. You can then scroll down to look at the various formats for the Regional Variables.

Form	Regional Variable	Example of Required Format	Description of Regional Variable
Reach	Stream Order	1,2,3, etc	The designations of the relative position of stream segments in a drainage basin network. See R6 Handbook, Appendix B for more information.
Reach	Valley Form	2	As described in the R6 Handbook (Value of 1 to 10) (Forest Option)
Reach	Flow Regime	Intermittent	Intermittent, Perennial, Ephemeral (Forest Option)
Channel Unit	Meas Grad @ Riffle	3	Gradient taken with an Abney Level at measured fast water units (Forest Option)
Channel Unit	H2O Temp (C)	13	Water Temperature taken in degrees Celsius using a handheld thermometer
Channel Unit	% Shade	54	Percent **shade** using a Solar Pathfinder (Forest Option)
Channel Unit	Riparian Veg*	#GF#GF#GF#ST#CD#SS#	As Described in R6 Handbook (Can also have a total of 3 values. e.g., #ST#CD#HA#). See pg 36 of this guide for valid codes.
Channel Unit	Date/Time H2O Temp	09/02/2001 1420	Date and time that water temperature was actually taken - not survey start date. Time H_20 temperature was taken (seconds are not required)
Channel Unit	SubstEst S,G,C,B,R	#10#30#20#40#0#	As Described in R6 Handbook (Forest Option), (Make sure to fill in all fields)

*Riparian vegetation relates to inner zone and outer zone (outer zone is forest option) as described in the R6 Handbook. #size class#overstory#understory#

****It is recommended that all AI data be entered before entering Aquatic Biota (AB) data. All sequence order numbers need to be correct before entering AB Data. This will ensure no AB data will be orphaned if a unit is deleted without first deleting the AB data. ****

AB Data

AB data will be entered through AI. Fish data will be entered into the SO number at which the data was collected.

Depending on the protocol chosen, the procedures for data entry will be different. **Figure 1 below gives more detailed instructions on entering data for each specific block.**

Please refer to the Stream Inventory Handbook, Region 6 for specific information pertaining to AB protocols.

Quick Tips

You only need to enter the sampling method into the Reach Tab unless another method was used. The method then will be entered into the individual unit in AB. Enter the method for identification in the yellow additional Comments Icon while your cursor is in the "Sample Number" box. Valid methods are Seine, Snorkel, Electroshock, or Hook and Line. (**Required R6 Field**)

You can choose types of species by genus or genus species.

R6 Westside/Eastside AI/AB Presence Protocol: You cannot enter any other number but a 1 or 0 for "Count" in the Sample Detail block. If you have an incidental count that you would like to enter please see # 7 below for instructions.

R6 Westside/Eastside AI/AB Presence Protocol: Use this protocol if counting fish. User can enter actual fish count numbers into the "Count" field in the Sample Detail Block.

AB Data Entry Instructions

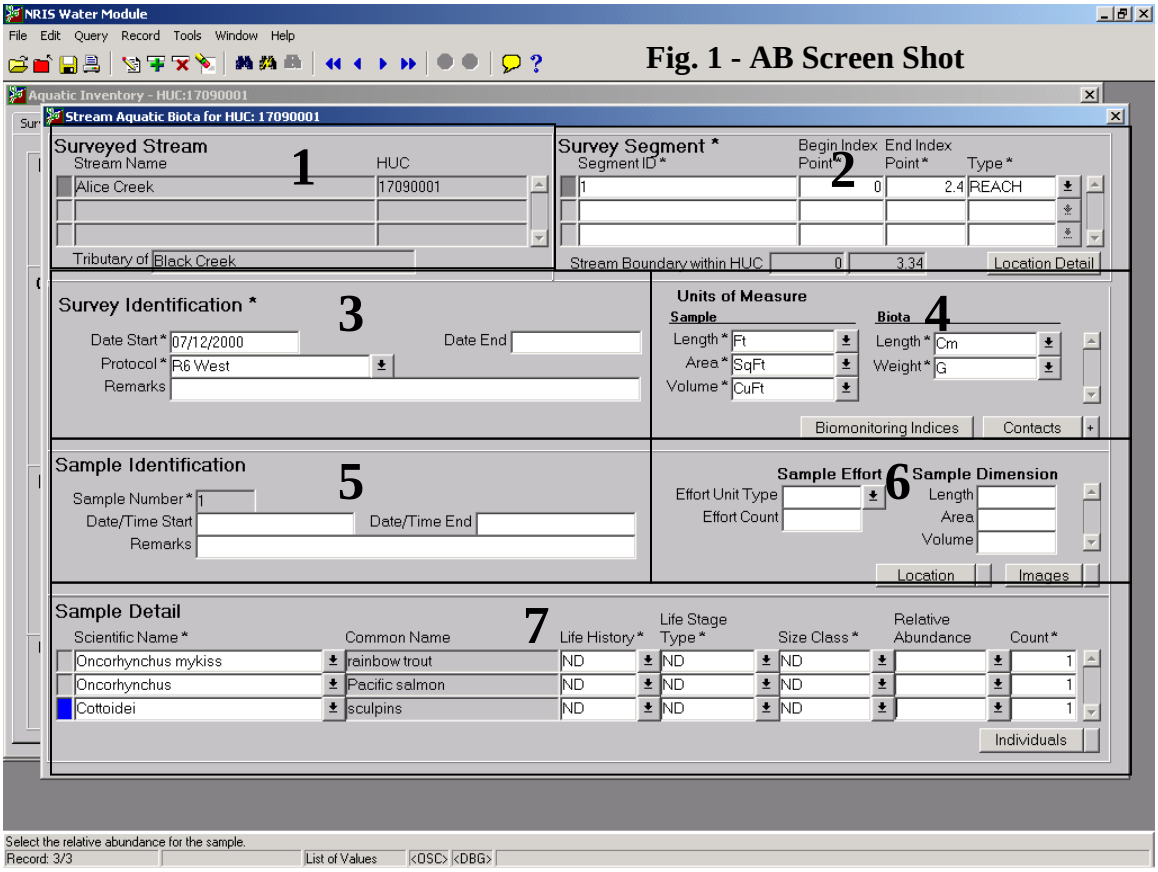


Fig. 1 - AB Screen Shot

1. This block is automatically filled in.
2. This block reflects the information for the Ecoreach from the survey tab and cannot be edited.
3. "Date Start" and "Protocol" fields are automatically filled in and cannot be edited.
   "Date End" – End day of the physical survey of the reach (Optional).
   "Remarks" – If no fish were observed enter "No fish observed". Can also enter any other pertinent information.
4. Units of measure for the sample shall be in English.
   Biota measurements can be in English or Metric. These fields are required. Contacts are the people who collected the data and can be selected here.
5. "Sample Number" is the sequence order number where the data was collected and cannot be edited.
   "Date/Time Start" and "Date/Time End" are start and ending time of the sample in this unit (**Required R6 Field**).
   "Remarks" – Enter any pertinent information here.
6. "Effort Unit Type" – Choose from Pull down menu.
   "Effort Count" – This refers to the amount of time spent in relation to your choice of Effort Unit Type.
   "Sample Dimension" – Enter information on area surveyed if available.
7. "Scientific Name" – Use query to find appropriate species name, ND will automatically fill into next 3 required fields. *****If you have a crew that incidentally

counted fish while using the Presence Protocol you can enter the count at this block using the yellow comment bubble. The comment will be attached to the specific species you have entered here. Use the General Tab to enter your numbers and any other pertinent information. (see pg 28 for more information on using the yellow comment bubble).
"Common Name" – Automatically filled in after choosing fish from query.
"Life History", "Life Stage Type", "Size Class" and "Relative Abundance" can be entered if data is available.
"Count" – Enter 1 if using presence protocol, Enter actual count if using count protocol (**R6 Required**).

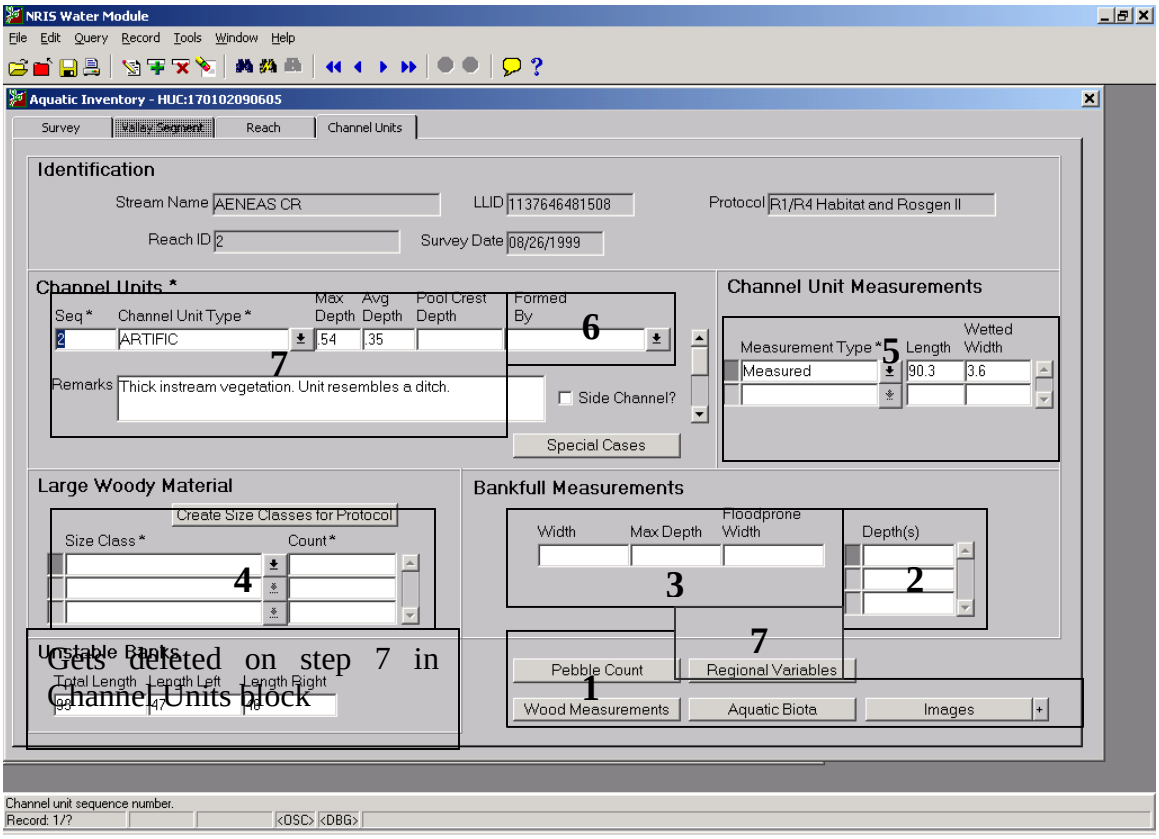
How to Delete in AI

You enter data in AI starting on the Survey Tab and proceed to successive tabs and forms. When you want to delete a survey, you generally do it in the opposite order that you enter data. Below are some tips to follow to delete an AI survey. The steps are grouped by tab.

When deleting it is important to remember you must delete using the delete icon (red X) and then save before moving to another block or form.

Channel Units Tab

The following graphic indicates the order that data needs to be deleted to successfully delete one channel unit. These steps must be repeated on each channel unit within a survey. When the scroll bar in the Channel Units block is no longer active and all the fields are blank, then you have deleted the channel unit data.



1. Be sure to click each button to make sure there is no data on the pop-up forms. Delete any data and save. You do not delete the Regional Variables. The Regional Variables get deleted on step 7 when you delete the Channel Units block.
2. Delete the bankfull depth measurements and save before deleting the other bankfull measurements.
3. Delete and save.
4. Delete all rows and save.
5. Delete all rows and save.
6. When you want to delete a channel unit and there is data in the *Formed By* field, you must place the cursor in the *Formed By* field and click the Delete icon, followed by the Save icon. This will delete the data in the *Formed By* field, as well as any data entered into the Special Cases popup form.

   Deleting Special Cases data: The only way to delete Special Cases data is by placing the cursor in the *Formed By* field and clicking the Delete icon, followed by the Save icon. The *Formed By* data and Special Cases data are stored in the same table.
7. Delete records in the Unstable Banks block by deleting records in the Channel Units block. Unstable Bank data and Channel Units data are stored in the same table, so by deleting the Channel Unit you will also delete the Unstable Banks data.

If you cannot delete a Channel Units record because of a "matching detail records exist" error and it appears that there are no detail records, you may have a ghost record. Refer to the Deleting Tips section in Chapter 3 for instructions in the User Guide for NRIS Water.

Reach Tab

Make sure all data is deleted from the Reach Characterizations popup form before exiting the Reach tab. It is possible to delete the Reach record but still have data left on the Reach Characterizations popup form, if that form is not checked. If this happens, you will not be able to delete the Survey on the Survey tab even though it appears as if all data has been deleted. To correct this, you will need to go back to the Reach tab and enter some data in the Reach Data block. You will then be able to open the Reach Characterizations form and delete any remaining data.

Survey Tab

Contacts must be deleted prior to deleting the Units of Measure and Surveys data, so if there is a "+" sign beside the Contacts button, first delete all contact data. The Units of Measure and Surveys data can then be deleted.

QUICK REFERENCES

Using the Keyboard

The following is a list of keyboard strokes that can be very useful while working in AI. The table is designed so it can be copied, cut out, and taped near a workstation. These can also be found by going to Help Menu (found in all tabs) → Keys.

ACTION	KEY
Cancel Query	Ctrl Q
Clear Record	Shift F4
Copy	Ctrl C
Count Records	Shift F2
Create Record	F6
Cut	Ctrl X
Delete Record	Shift F6
Duplicate Item	F3
Duplicate Record	F4
Enter-Query	F7
Execute Query	F8
Exit	Ctrl Q
Help	F1
List of Values	F9
Next Item	Tab
Next Record	Down Arrow
Paste	Ctrl V
Previous Item	Shift Tab
Previous Record	Up Arrow
Print	Shift F8
Save	F10

General Information – Helpful Hints and Troubleshooting

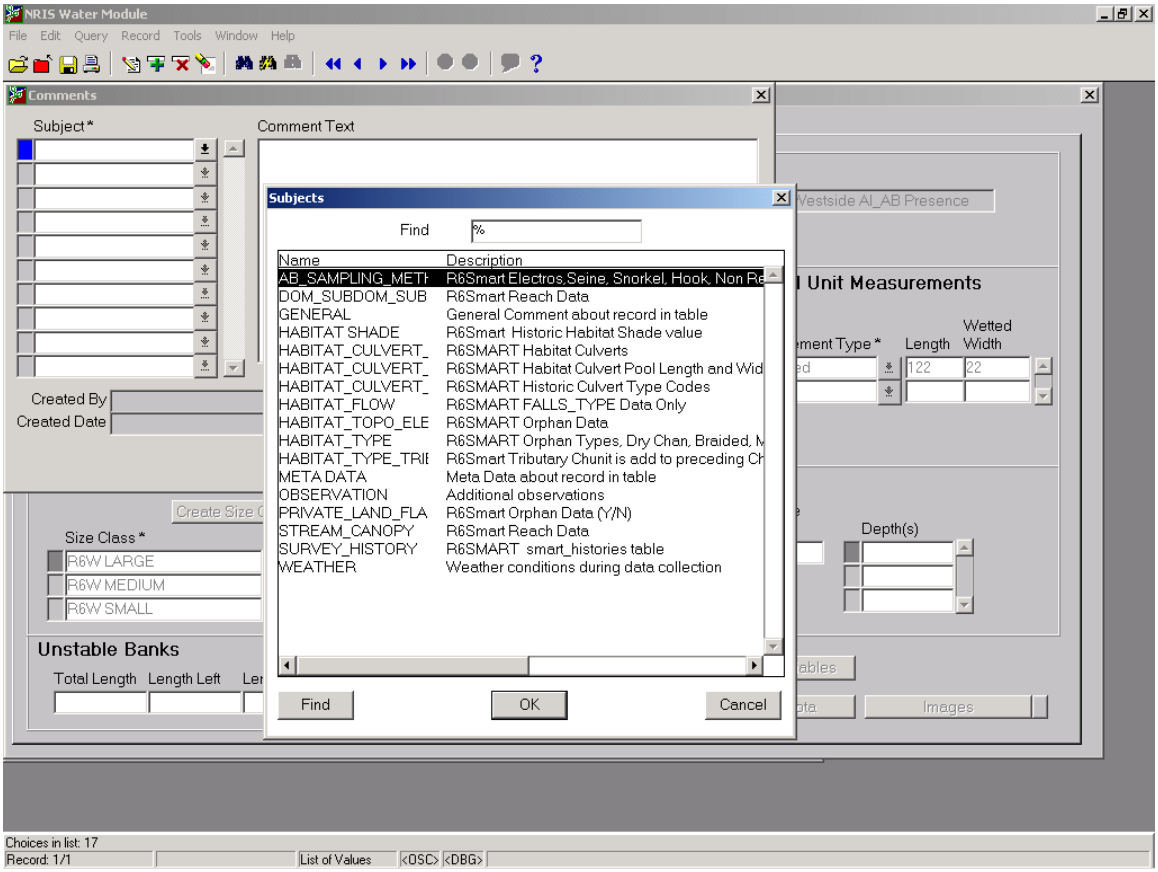
The following table highlights some helpful tips for the user as they are doing data entry. It's a little like a troubleshooting guide. If the user needs some guidance on a certain item they may find it here. Some of the information is repeated from the previous sections in this document.

Form	**Field/ Subject**	Comment
General	Not seeing entire screen	Change the resolution on your computer to 1024x768
All	* Fields	Fields with an asterisk are required
Survey	Segment ID	Number sequentially from downstream to upstream – 1,2,3,4
Reach	Pebble Counts	Enter Pebble count data here not within the Channel Unit Tab
Reach and Channel Units	Regional Variables	Don't forget Regional Variables – Check Regional Variables table for help, Must use the mouse to access the button
Channel Units	Sequence	Not automatically filled in so be aware of numbers. WARNING: sequence on Field data form often incorrect
Channel Units	Length and Width	Can have measured length and observed width (can also have measured width)
Channel Units	Wood Size Classes	**Be aware** – ordered alphabetically so Large, Medium, Small
Channel Units	Side Channels	First choose the unit (Fast or slow water dominated) then check off side channel box. Side channel dimensions are usually observed dimensions not measured.
Channel Units	Sequence numbers in reaches	When entering sequence numbers be aware where your reach ends. NRIS AI will not prompt you to go to next reach when you enter the last sequence number of the reach.
Channel Units	Moving from distances to wood	Do not push Enter after entering distances, move cursor to wood block and click the Create Size Classes for Protocol, **do not** click the down arrows within the block. If you accidentally push enter after the distances an error will appear, ignore it. It means nothing.
Channel Units	Moving into Unstable Banks block	You must use mouse to move into block. You can arrow through to get out.
Channel Units	Special Cases	The Special Case button is only available on certain channel units and becomes available **after you save.**

General Instructions on Yellow Additional Comment Icon

The yellow additional comments icon is available at each tab within the NRIS Water database on the top toolbar.

It becomes available only after the information entered on that screen is saved. This is used in a variety of situations (see below) and should be used to store information that you may want to query for later. It is best to have the cursor in the first block of any screen when using the comment box. When you click on the icon a separate screen will appear as seen in the screen shot below. See the table below for specific details on the use of the subjects in this pulldown. Notice not all of them are used and some will hold only legacy data from SMART.



Once comments have been entered into this area the yellow bubble will appear to have writing in it ( ).

Where to Use the Yellow Comment Icon

	Subject Pulldown			
Situation	**Name***	**Description**	**Comment Text**	**Pg #**
Fish Sampling Method (Reach Tab)	AB_SAMPLING_METH	R6Smart Electros,Seine,Snorkel, Hook, Non Recd	Enter type of sampling method used in reach	12
Tributaries	HABITAT_TYPE_TRIB	R6Smart Tributary Chunit is add to preceding Chunit	Enter minimum of bank orientation, temperature, time of temperature, gradient, flow contribution to mainstem, tributary name (if on map)	15
Special Cases (Dams, marshes, braids)	HABITAT_TYPE	R6Smart Orphan Types, Dry Chan, Braided, Marsh	Enter the type of special case, and any other pertinent information	16
Dry Channel	HABITAT_TYPE	R6Smart Orphan Types, Dry Chan, Braided, Marsh	Enter Dry channel and any other information pertinent to the unit	16
Culvert	HABITAT_CULVERT_	R6SMART Historic Culvert Type Codes	Indicate the culvert type (open arch, round pipe, etc.)	17
Culvert	HABITAT_CULVERT_	R6SMART Habitat Culvert Pool Length and Width	Enter the length and width of the pool below the culvert if one is present. If one is not present enter "No pool below culvert".	17
General Information	GENERAL	General Comment about record in table	User discretion	
General Information	OBSERVATION	Additional observations	User discretion	
Aquatic Biota / Sample Detail/ Scientific Name	GENERAL	General Comment about record in table	Enter incidental count of fish taken during a presence survey	23

*****Some of the names in this area are cut off so using both the Name and the Description is needed

Inserting Images

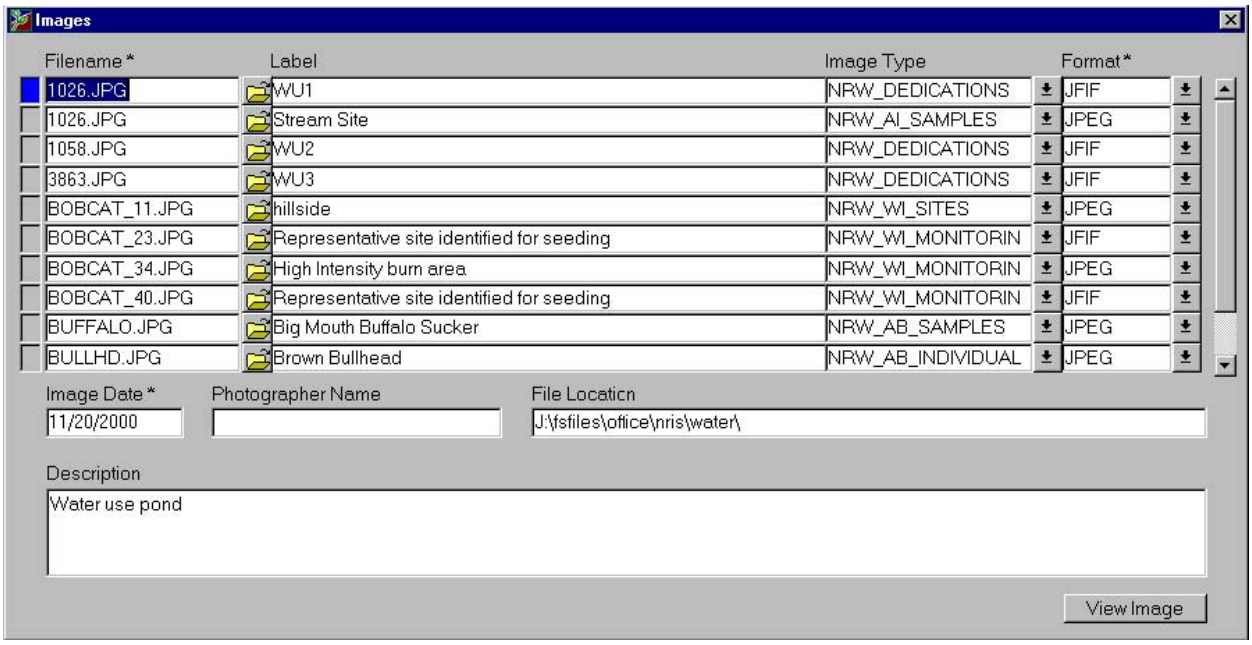
The Image Maintenance Form

This form provides you with the ability to attach images (maps, photos, drawings) to your data. The system will work best if image files are stored and maintained in a central location for the entire application. It is possible to store files to any drive that a networked computer has mapped. Other users will not have access to files if the files are located on PCs or in directories on the server that all users do not have access to.

The Attached Images and Available Images popup forms are used to link the images to a specific submodule record.

There are two ways to access the maintenance form. You can select *File/Open/Maintenance/Images/* on the menu bar, or you can right click with the mouse while the Attached Images popup form is open and the cursor is in the popup window. The new window that appears will have the Images maintenance form listed as an option.

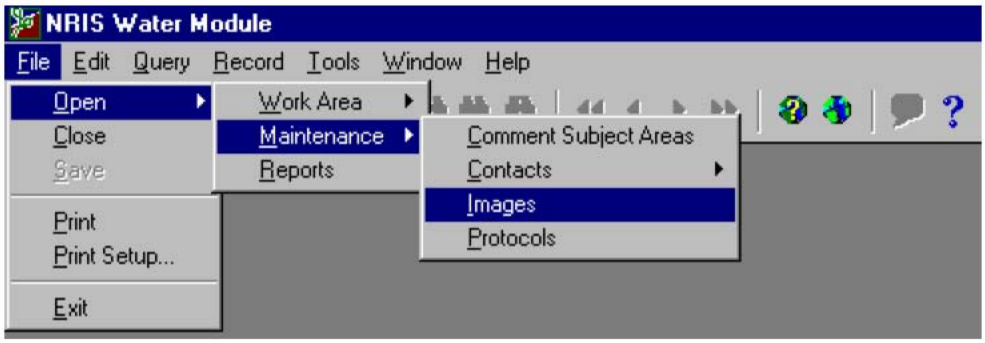
The Images maintenance form lists all of the images that are available to be associated with surveys, projects, etc. You can view available images or add new images using this form.



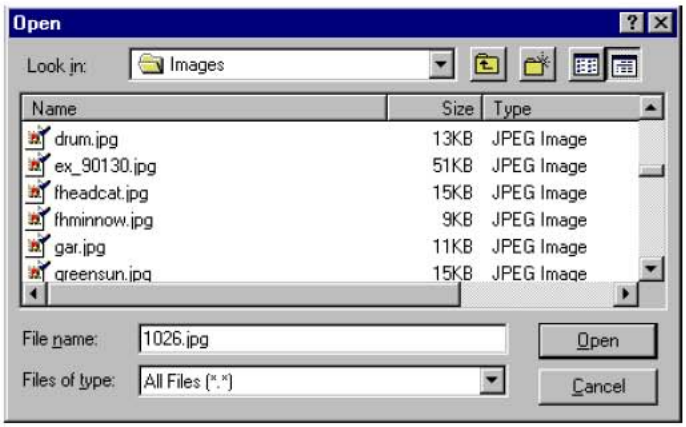
To add a new image to the list of images, the first step is to add the new image file to the default file folder that is being used to store images associated with survey data. This file folder directory was created by the System Administrator during the application set-up process. The open yellow folder icon, located between the first and second columns on the Images maintenance form, provides the link to the image file folder. When saving photos avoid using spaces (use underscores as a replacement) and remain consistent with upper case or lower case characters.

Once stored, images should not be moved since the image location is saved in the database once an image is associated to a survey or activity.

Images Form

Step No.	Field	Instructions
1.	Click *File* in the Menu Bar at the top left of your screen, and then click *Open/Maintenance/Images* to display the *File* cascading menu.  This opens the Images maintenance form.	

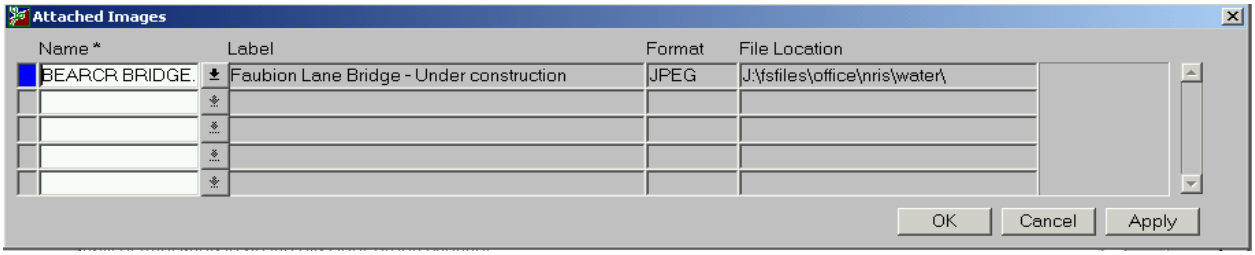
Images Form

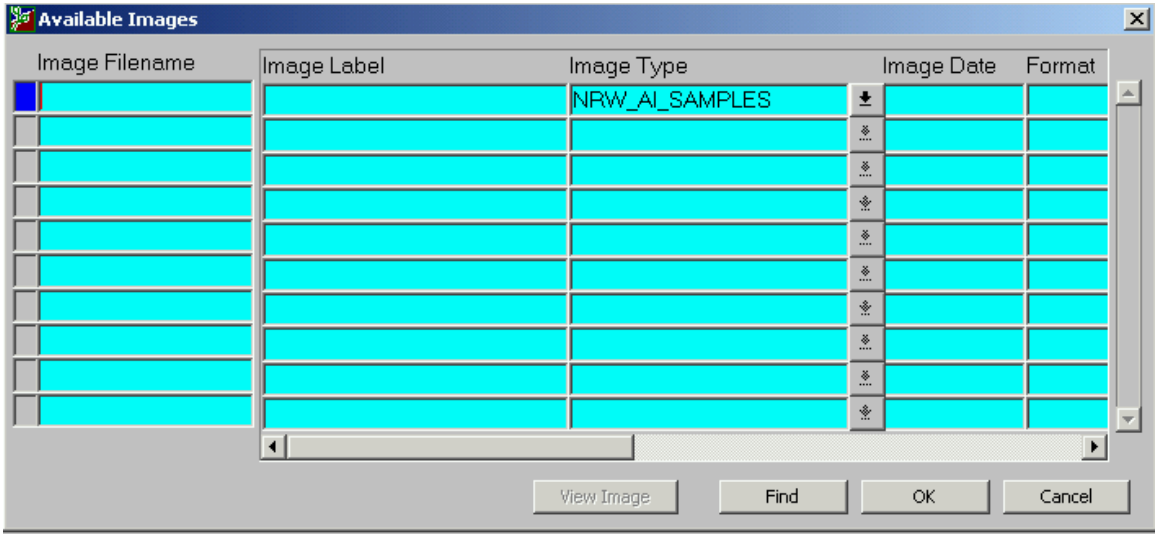
Step No.	Field	Instructions
2.	*Filename*	**Mandatory field entry.** To create a blank record, place the cursor in any field and click on the Insert Record icon in the toolbar at the top of the screen. With the cursor in the blank *Filename* field, click on the open yellow file folder icon to the right of the *Filename* field. This opens the default Images file folder that contains a list of available images.  Highlight the image you want to add to the list of images available from within NRIS Water, and click the *Open* button. This enters the highlighted image filename into the *Filename* field on the Images form.
3.	*Label*	Enter a short description of the image.
4.	*Image Type*	Select *Image Type* from the pull-down menu to associate the image with a particular data block. **Note:** It is important to select an *Image Type* for the image. If you do not, the image will not show up as an available image if *Image Type* is specified in a query if available images.
5.	*Format*	**Mandatory field entry.** Select the image *Format* from the pull-down menu.
6.	*Image Date*	**Mandatory field entry**. Enter the date (MM/DD/YYYY) that the image was created.
7.	*Photographer Name*	Enter the name of the photographer.
8.	*File Location*	The prefilled *File Location* points to the file where the image is located. **Note:** The database stores information about the path to an image file, but it does not store the image itself. For this reason, it is important to store the file in a location that is accessible to all of the application users. This corporate location is represented by the default file path.

Step No.	Field	Instructions
9.	*Description*	Describe the image. Maximum length is 70 characters. **Tip:** After attaching an image to WIT monitoring activities, additional description space is available. This space is accessible by selecting *Image Description* from the Type field pull-down menu in the Monitoring Information block on the WIT Monitoring tab. Up to 2,000 characters can be entered.
10.	*View Image* button. To view the image, click the *View Image* button.	

Attached Images Popup Form

The Attached Images popup form is used to associate images to a data block. Access this form by clicking on the *Images* button on any submodule form. Before an image can be linked to data, the image must first be made available in the Images maintenance form. Only then can it be selected using the Attached Images popup form.



Step No.	Field	Instructions
1.	*Name*	Click on the pull-down menu arrow. This opens the *Available Images* popup query form. The fields appear blue, which means that the form is ready to be used to perform a query. You can query on any field.  **Note:** When the query form pops up, *Image Type* will be filled with the name of the image type associated to the data block where the *Images* button was located. If the image you want to attach has a different image type, you may: 1) change or delete the prefilled image type and select a different type; or 2) delete the value in *Image Type* and run the query with no parameters to get a complete list of all images.
2.	Click the *Find* button. This will list images that meet the query criteria. The color of the fields becomes white. To view an image, highlight a record and click the *View Image* button. **Note:** If the list of available images doesn't have the image you expect or desire, another query can be performed by clicking the *Query* button and entering a new set of query criteria.	

3.	Highlight an image record in *Image Filename* and click the OK button. This returns you to the *Attached Images* form and lists the image you selected. A thumbnail version of the image will appear on the far right of the form. **Tip:** You can click on the image to open the Image File popup form showing an enlarged version of the image.
4.	Click the *OK* button on the Attached Images form to associate the selected image with the data record.

Vegetation Codes used for the Riparian Veg Regional Variable

Riparian vegetation relates to inner zone and outer zone (outer zone is forest option) as described in the R6 Handbook.
(Regional Variable format for Riparian Veg – #size class#overstory#understory#)
Size class codes can appear in the size class, overstory, and understory categories of the Riparian Veg code.

Size Class Code

NV = No Vegetation.
The no vegetation condition is characterized by the predominance of bare soil or naked rock.

GF = Grass/Forb condition
The grass/forb stand condition lasts 2-5 years and occasionally as long as 10 years. Shrubs and some trees that sprout are not yet dominant.

SS = Shrub/Seedling condition
The shrub stand condition often lasts 3-10 years but may remain for 20-30 years if tree generation is delayed. Tree regeneration may be common, but trees are generally less than 10-ft. tall and provide less than 30 percent of crown cover.

SP = Sapling/Pole condition
The open sapling/pole condition occurs when trees exceed 10 ft. in height and are between 5 in. and 8.9 in. dbh.

ST = Small Tree condition
The small tree condition has very little ground vegetation because of closed crown canopy. Average stand dbh is 9 in. to 20.9 in.

LT = Large Tree condition
The large tree condition is characterized by trees with an average dbh of 21 in. to 32 in. dbh. An understory of shrubs and young shade-tolerant trees is present.

MT = Mature Tree condition
The mature tree stand conditions are characterized by old live trees, snags, down woody material, and the replacement of some of the long-lived pioneer species such as Douglas-fir by shade-tolerant species such as western hemlock. Size is generally greater than 32 in. dbh

Overstory and Understory Codes

Hardwood:
HA = Alder
HB = Bigleaf maple
HC = Cottonwood, ash, poplar
HD = Dogwood
HE = Elderberry
HL = Liveoak, canyon
HM = Madrone
HO = Oak, Oregon white, California black
HQ = Quaking aspen
HT = Tanoak
HV = Vine Maple
HW = Willow
HX = Other/unknown

Conifer:
CA = Subalpine fir, mountain hemlock, whitebark pine
CC = Cedar, western red
CD = Douglas-fir
CE = Subalpine fir _ Engelmann spruce
CF = Fir, silver and noble
CH = Hemlock, western
CJ = Juniper
CL = Lodgepole pine, shore pine
CM = Mountain Hemlock
CP = Ponderosa pine, Jeffrey Pine
CQ = Western white pine
CR = Red fir
CS = Spruce, Sitka
CT = Port-Orford-cedar
CW = White fir, grand fir
CY = Yew
CX = Other/Unknown

Formed By Crosswalk Table

FORMED BY (the force)	FORMED BY CODE
Beaver	BV
Wood	WD
Bedrock	BR
Boulder	BO
Stream Bend	SB
Tributary	TR
Culvert	CU
Dam	DA
Restoration	RS
Other	OT

Crosswalk Table for R6 Channel Unit codes and AI Channel Unit Codes (3rd Level)

THIRD LEVEL	R6 CHANNEL UNIT CODE	NRIS AI Code
Cascade	FTCC	CASCADE
Rapid	FTRP	RAPID
Riffle, Low Gradient	FTRF	RIFFLE
Run	FNRN	RUN
Sheet	FNSH	SHEET
Beaver Dam Pool	SDBV	BVRDAM
Debris Dam Pool	SDDD	DEBRIS
Landslide Pool	SDLS	SLIDE
Convergence Pool	SSCV	CONVERGE
Lateral Scour Pool	SSLS	LATERAL
Mid-channel Pool	SSMC	MIDCHNL
Plunge Pool	SSPL	PLUNGE

Partial List of Fish and Amphibian Species

CODE	GENUS AND SPECIES	COMMON NAME
CAXX	*Catostomus* sp.	Unknown sucker
COXX	*Cottus* sp.	Unknown sculpin
GAAC	*Gasterosteus aculeatus*	Threespine stickleback
GIBI	*Gila bicolor*	Tui chub
JUVL	.....	Unknown juvenile salmonid
ONCL	*Oncorhynchus clarkii*	Cutthroat trout
ONGO	*Oncorhynchus gorbushcha*	Pink salmon
ONKE	*Oncorhynchus keta*	Chum salmon
ONKI	*Oncorhynchus kisutch*	Coho salmon
ONMY	*Oncorhynchus mykiss*	Steelhead, Rainbow, Redband
ONNE	*Oncorhynchus nerka*	Sockeye salmon
ONTS	*Oncorhynchus tshawytscha*	Chinook salmon
ONXX	*Oncorhynchus* sp.	Unknown salmon/trout
PRWI	*Prosopium williamsoni*	Mountain whitefish
PTOR	*Ptychocheilus oregonensis*	Northern squawfish
RHCA	*Rhinichtyhs cataractae*	Longnose dace
RHXX	*Rhinichthys* sp.	Unknown dace
SACO	*Salvelinus confluentus*	Bull trout
SAFO	*Salvelinus fontinalis*	Brook Trout
SATR	*Salmo trutta*	Brown Trout
AMGR	*Ambystoma gracile*	Northwestern salamander
AMTI	*Ambystoma tigrinum*	Tiger salamander
ASTR	*Ascaphus truei*	Tailed frog
BAWR	*Batrachoseps wrighti*	Oregon slender salamander
BUBO	*Bufo boreas*	Western toad
BUWO	*Bufo woodhousii*	Woodhouse's toad
DICO	*Dicamptodon copei*	Cope's giant salamander
DITE	*Dicamptodon tenebrosus*	Pacific giant salamander
ENES	*Ensatina eschoscholtzii*	Ensatina
PLEL	*Plethodon elongatus*	Del Norte salamander
PLDU	*Plethodon dunni*	Dunn's salamander
PSRE	*Pseudacris regilla*	Pacific chorus frog
RAAU	*Rana aurora*	Red-legged frog
RABO	*Rana boylii*	Foothill yellow-legged frog
RACA	*Rana cascadae*	Cascades frog
RAPI	*Rana pipiens*	Northern leopard frog
RAPR	*Rana pretiosa*	Spotted frog
RHCAS	*Rhyacotriton cascadae*	Cascade torrent salamander
SPIN	*Spea intermontana*	Great Basin spadefoot
TAGR	*Taricha granulosa*	Roughskin newt

Macroinvertebrate Taxa

Ephemeroptera	Mayflies
Odonata	Dragonflies and Damselflies
Plecoptera	Stoneflies
Trichoptera	Caddis flies
Gastropoda	Gastropods, slugs, snails
Diptera	Midges
Heteroptera	Water striders
Coleoptera	Beetles
Megaloptera	Dobsonflies, fishflies, hellgrammites alderflies
Astacidae	Crayfish

APPENDIX J

Finding Your GIS Stream Route

The USDA Forest Service, Pacific Northwest Region provides a series of short courses in the use of NRIS for data entry and analysis. However, for those that have access to a PC equipped with the NRIS software, but have not had a chance to obtain formal training in NRIS Water, follow the bullet steps below to determine the entire GIS stream route of your stream selected for inventory. But to use this tool, you will need to know at least the 4th HUC Code for the watershed in which your stream lies.

Assumptions: you have no training in NRIS Water; there is no NRIS software loaded on a PC designated for your use; you know the correct name of the stream; you have a clear understanding and representation of the length of stream targeted for survey;

- Click on the Windows "START" button located on the taskbar (at the bottom of most desktop screens).
- Place cursor on "Forest Service" in the pop-up START menu.
- Shift cursor to the right atop "NRIS" in the Forest Service pop-up menu.
- Shift cursor to the right again atop "Water" the NRIS pop-up menu.
- Shift cursor to the right again and click on the "Water v1.1.1i" button.
- For Username: in the "Logon" window, type a forward slash (i.e., /).
- hit the tab button.
- For Password: in the "Logon" window, simply hit the tab button again.
- For Database: in the "Logon" window, type idb.
- Click on the "Connect" button at the bottom of the "Logon" window.
- The NRIS Water Module, Main Menu will open, and a window with a HUC tree (equipped with a scroll bar on the right) will appear on the left side of the Main Menu window.
- Navigate through the HUC tree to find the 4th Level HUC for your target stream, continue to expand the tree to the 6th Level HUC if possible, and click on the appropriate HUC code in which your stream occurs (e.g., the 4th Level HUC 17060101 Hells Canyon).
  - ✓ …or enter the 8-digit code for your 4th Level HUC in the upper right hand block labeled "HUC" (or enter the 12-digit code for the 6th Level HUC if your GIS "Watershed" layer is defined to the 6th Level HUC).
- Click on the "Find" button to the right of the HUC block (the HUC code you have typed will also appear in the block to the left of the HUC block…the HUC identified in the left hand block is where NRIS will take you).
- Click on "Aquatic Inventory" from the set of function buttons to the right of the HUC tree.
- Inspect the names of streams listed in the "Stream Name" column; they have a specific case, and the style of case was decided by whomever built the GIS "stream routes" layer. You will need to match the case you observe.

- On the toolbar at the top of the window, click on the all black binoculars icon for "Enter Query" (it's to the left of the lightening bolt binoculars icon for Execute Query)…the columns for Stream Name, HUC, and LLID will turn light blue).
- Place cursor in the first block beneath "Stream Name" and type the first 3 or 4 letters of the name of your target stream, then type a % sign attached to the end of the letters you have typed; no spaces should be placed between the letters and the percent sign. Remember to use the same case as you observed when you inspected the column labeled "Stream Name" (e.g., Bea%).
- On the toolbar at the top of the window, click on the lightening bolt binoculars icon for "Execute Query"…a list of streams within your HUC that begin with the letters you typed will appear in the column labeled Stream Name (e.g., Beach Creek, Beargrass Creek, Beatle Creek).
- On the toolbar at the top of the window, click on the right hand globe icon called "GIS Display".
- A "GF – Xstart Client Startup Info" window will appear…Host is the GIS server (mainframe computer)…User ID is likely to be someone else if you have never used NRIS before.
- Type in their "Password"…and wait…patiently…
- Click on "Yes" and/or "OK" to any dialog windows that may open…eventually, two GIS layers will load, "stream routes" and "Watershed".

…and highlighted in orange is the route that defines your target stream

- Use one of several tools found in the toolbar at the top of the ArcView window to expand the view of your target stream so that the view fills the screen.
- If desired, add other GIS layers to increase the detail of the view…you will need to know the names of the GIS layers and their file location (talk to your GIS expert).

Compare the ArcView display of your target stream with the quad map (or other) representation of the same stream. If your planned survey deviates at all from the route displayed in GIS, the portion of the planned survey that does not align with the GIS stream route must be a separate survey.

APPENDIX K

R6 SMART Query / Report User Guide

R6 SMART Query/Report User Guide

March 2, 2005

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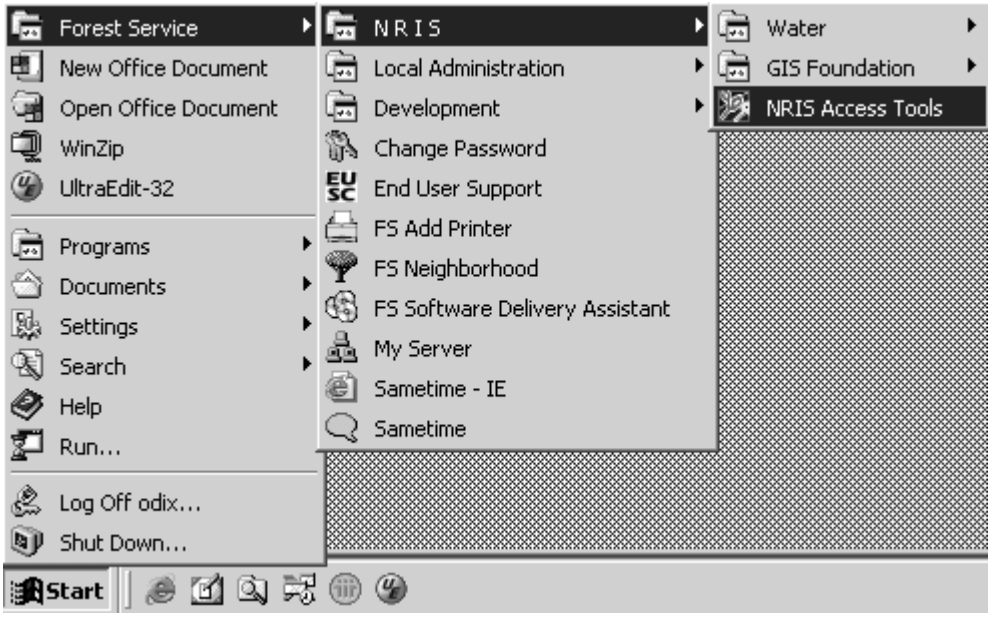
STARTING THE ACCESS TOOL:

1. To open the Access Tool click on Start>Forest Service>NRIS>NRIS Access Tools.



Note: If you are unable to find this shortcut, do the following:

1. You will need to have Administrative privileges to install the software. Call the End User Support Center (EUSC) at 1-888-426-3872 and ask for Administrative privileges and the Access Tool client.

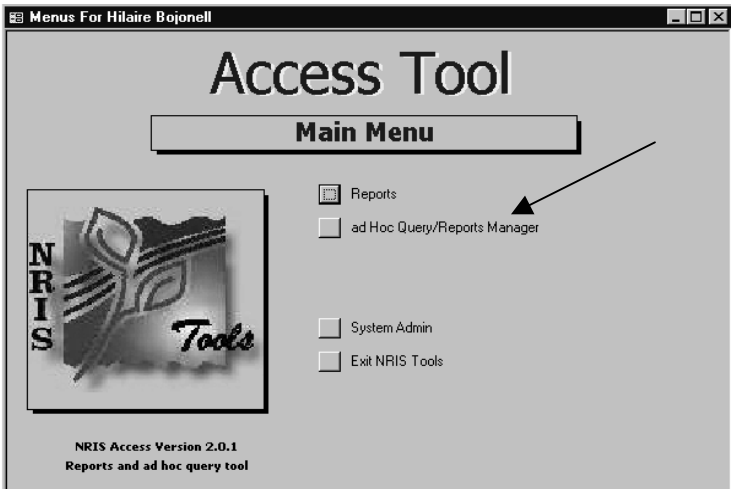
   Or

2. Call EUSC to get Administrative privileges, then call the Water Help desk at 541-750-7100 and ask to install the Access Tool client.

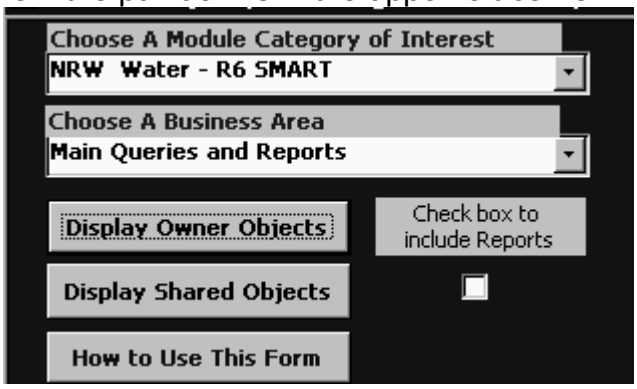
2. At the log in window, enter your name on the second line the very first time you log on. After the first time select your name from the pull-down on the first line.

3.Click the Log In button. NOTE: It can take up to several hours the very first time you log in as the Access Tool links to all the NRIS tables. Minimize the Access Tool and work on something else as it links.

4. When the Main Menu appears, click on ad Hoc Query/Reports Manager



5. Select the following from the pull-downs in the upper left corner:

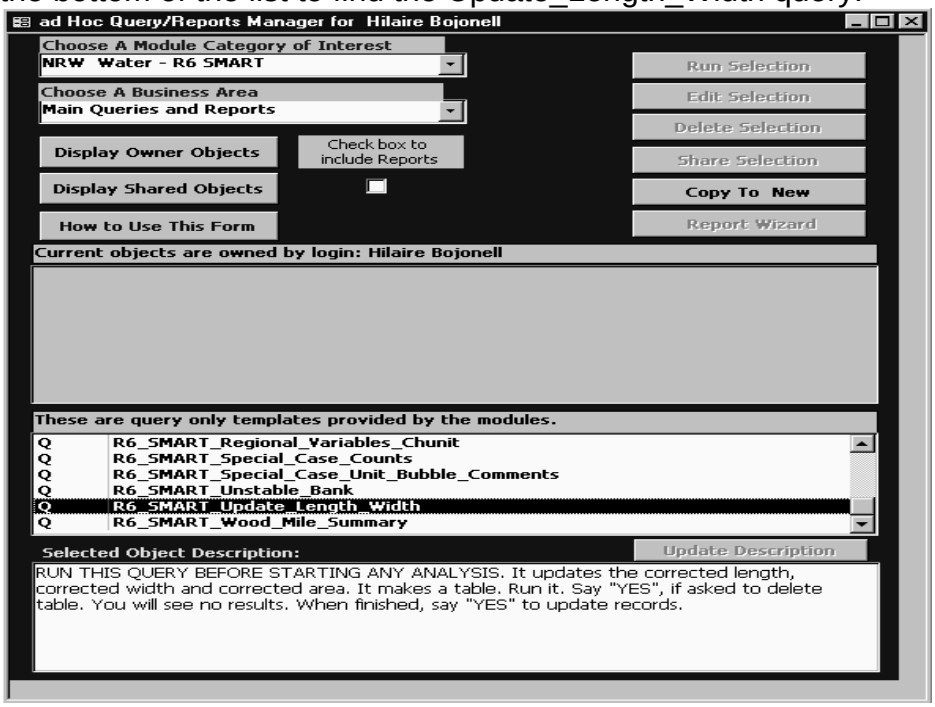


DATA ANALYSIS QUERIES:

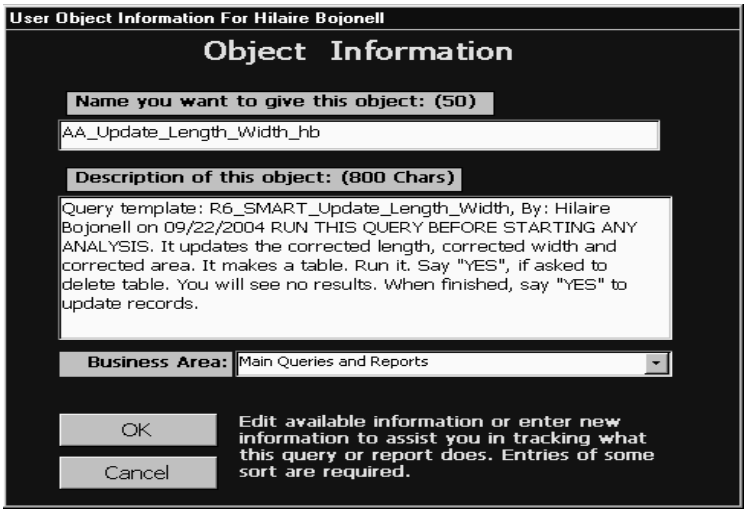
Running the Update Length Width query for the First Time:

This is the most important step to data analysis. You **must do** this step every time you start to analyze data for a new area. It updates the habitat unit length and width data on your PC and makes the main queries run much faster. If you do not do this step you may not have the most recent data.

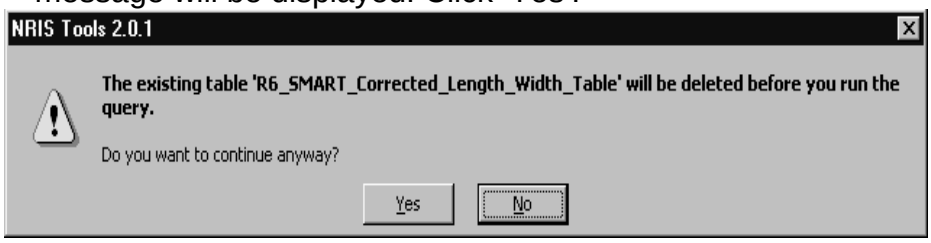
1. From the Access Tool main menu, click ad Hoc Query/Reports Manager
2. Click the pull-down menu to select a Module Category
3. Select 'NRW Water – R6 SMART' **Note:** All the Water options will begin with NRW.
4. Click the pull-down menu to select a Business Area
5. Select 'Main Queries and Reports'. You will not need to go to 'Subqueries'.
6. From the list of templates provided, select the R6_SMART_Update_Length_Width query. The queries sort alphabetically. Scroll to the bottom of the list to find the Update_Length_Width query.



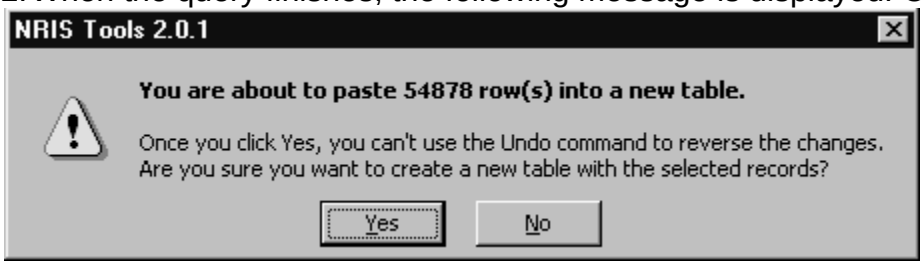
7. Click the Copy To New button to copy the template to your area
   The following box will appear on your screen.



8. Enter a new name for the query. The Copy to New process requires you to enter a name. Duplicate names are not allowed. Do not include characters such as &, ‘, /, * in your query name. A suggested name would be the name of the query plus your initials, for example, AA_Update_Length_Width_hb as shown above. **Tip:** To make this query be the first one in your list, it is suggested that you prefix the name with ‘AA’.
9. Click OK to open the query in the design view.
10. While in the design view, you may want to filter the query for a smaller set of data depending on your analysis needs. For more information on filtering, refer to **Appendix A**. The query may take as long as10 to 30 minutes to run if you want data from the entire forest.
11. Click the Run icon, , to run the query. When you do this, the following message will be displayed. Click ‘Yes’.



12. When the query finishes, the following message is displayed. Click ‘Yes’.



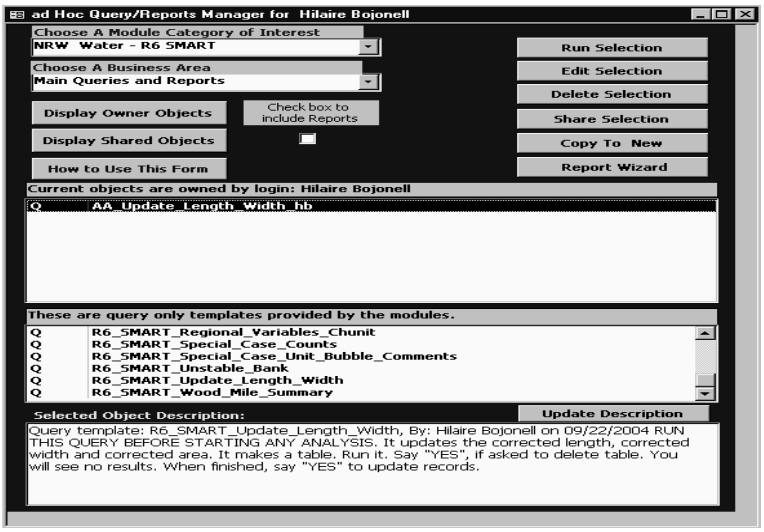
Note: The number of rows to be pasted will vary.

13. After this message, close the query by clicking the X in the upper right corner. Note: No results are displayed from this query. You may now continue with your analysis and run any queries or reports.

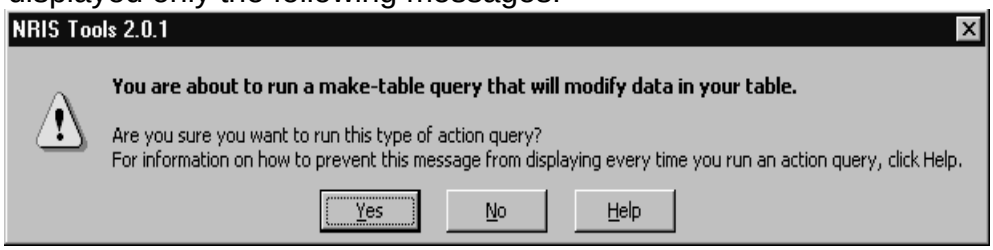
Running the Update Length Width query AFTER the First Time:

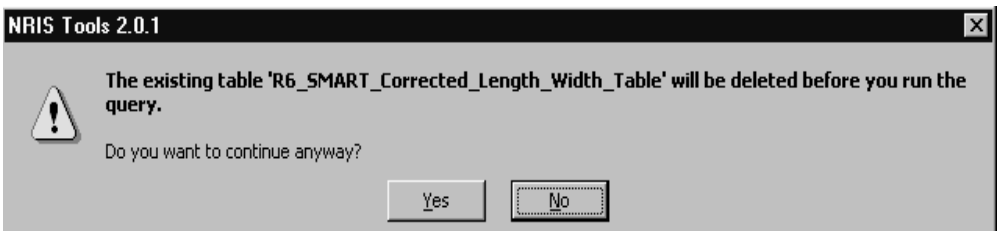
To run this query in the future just select it from your personal space, as shown below, and click the Run Selection button in the upper right corner. This will run the query on the entire forest.

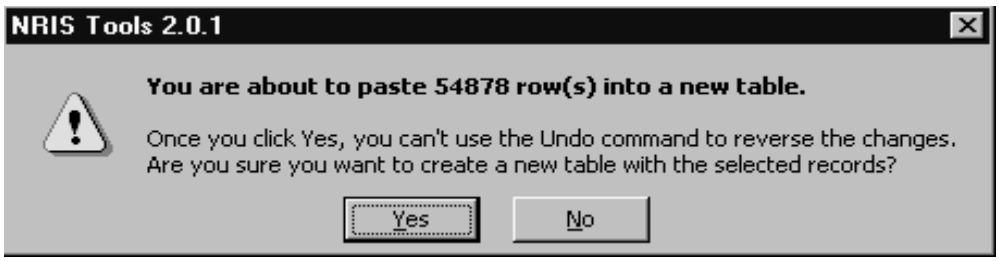
To filter this query prior to running it, click the Edit Selection button to open the query in the Design View. Go to **Appendix A** for tips on how to filter. After entering the filter criteria click the Run icon, .



When you do this, a series of messages will be displayed. Click 'Yes' to all of them. No results are displayed only the following messages.







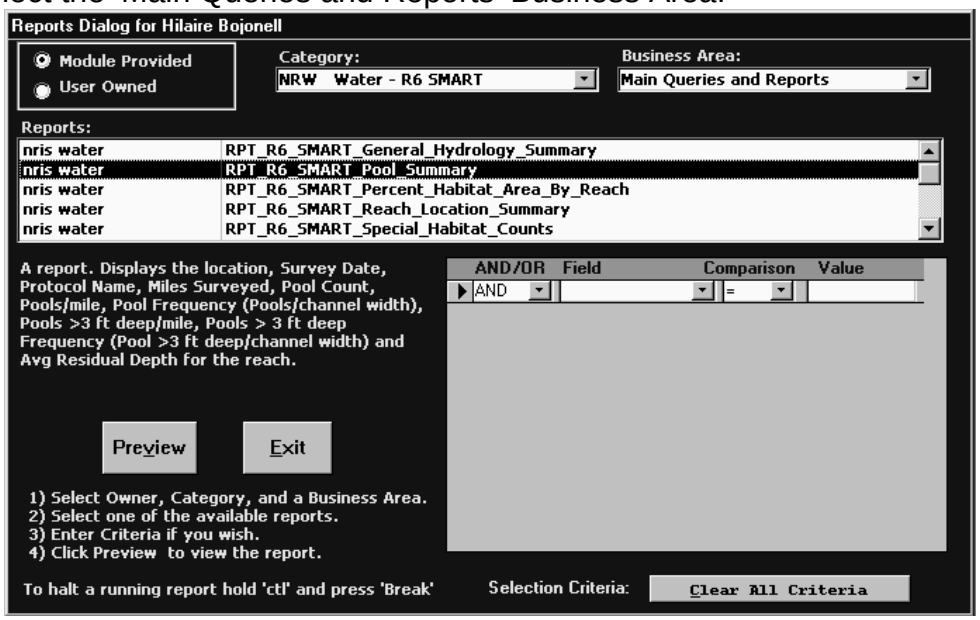
Note: The number of rows to be pasted will vary.

After running this query, you may run any of the other Main queries or reports.

Running Reports:

There are several R6 SMART reports. Reports are based on queries and summarize the information in the queries in a more formal layout.

1. Run the Update Length Width query before running any reports to make sure you are using the most current information in the database.
2. After running the Update Length Width query, close the ad Hoc Query/Reports window to return to the Main Menu.
3. From the Main Menu select Reports.
4. Select the 'NRW Water – R6 SMART' Category.
5. Select the 'Main Queries and Reports' Business Area.



6. Select a report.
7. Most likely you will want to filter the report prior to clicking the Preview button.
8. To filter use the pull-downs in the Criteria box in the lower right corner of the dialog window.

TO FILTER FOR A 5TH FIELD HUC:

AND/OR	Field	Comparison	Value
AND	HUC	Like	1701020906*
AND		=	

Note: Use 'Like' if you are using a wildcard (*).

To filter for a particular stream in a particular HUC:

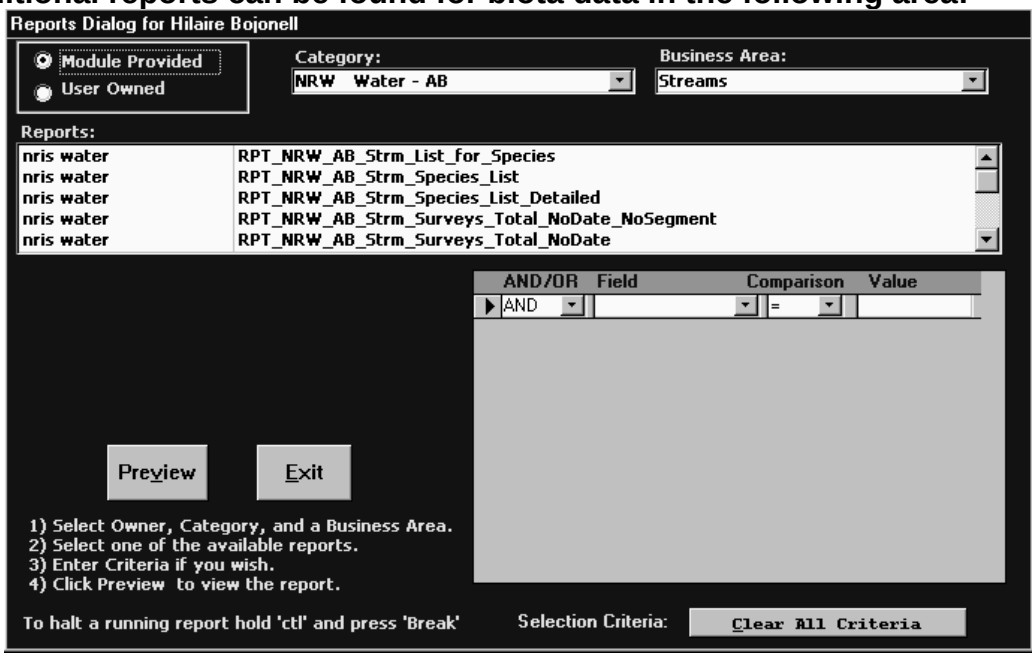
AND/OR	Field	Comparison	Value
AND	HUC	=	170102090605
AND	Stream_Name	=	Yellowjacket Cr
AND		=	

Note: If you use the '=' in the Comparison column, then anything in the Value column must be spelled EXACTLY as it is in the database.

9. Click the Preview button to run the report.

10. The report displays one page at a time. Use the page arrows in the lower left corner of the report to move to the next page.
11. After the report runs, you can print it or export it to a Word Document by clicking the Office Links icon . **Note:** The bold lines used to separate the sections of the report will not show up in a Word Document, and the heading for some of the columns will become distorted. These are glitches in the MS Access export process and cannot be fixed by NRIS.

Additional reports can be found for biota data in the following area:



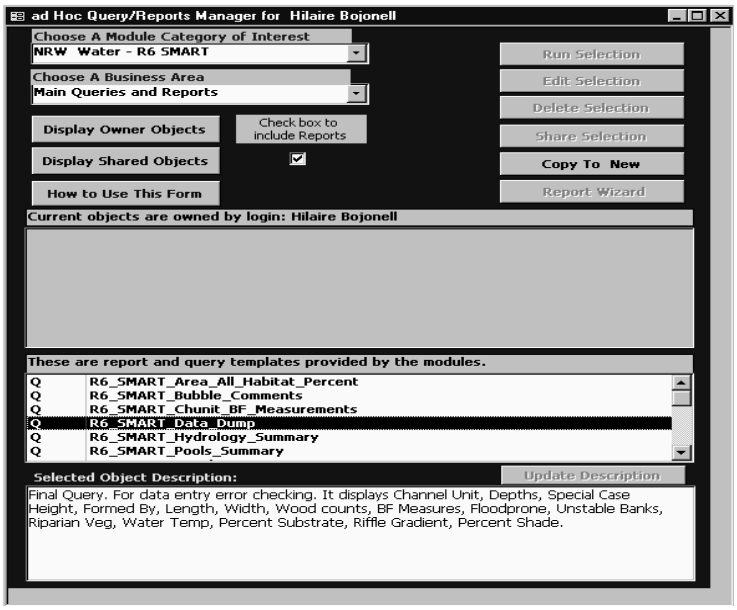
ERROR CHECKING QUERIES:

The following queries can be used to check for data entry errors:

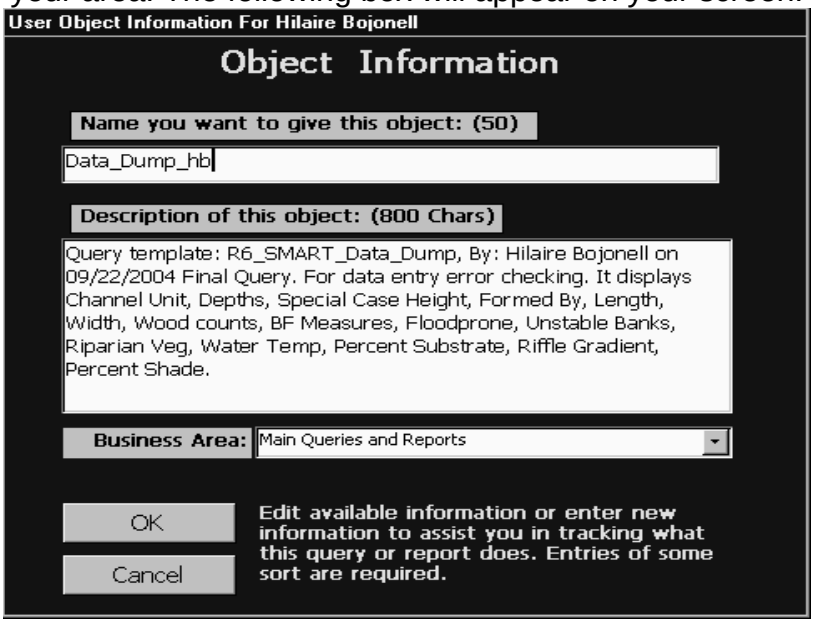
1. R6_SMART_Data_Dump
2. R6_SMART_Chunit_BF_Measurements
3. R6_SMART_Special_Case_Unit_Bubble_Comments
4. R6_SMART_Regional_Variables_Chunit
5. R6_SMART_Reach_Location_Summary_t
6. QRY_NRW_AB_Strm_Species_List_Detailed

These are the general steps you need to run the queries in the Access Tool.

1. From the Access Tool main menu, click ad Hoc Query/Reports Manager
2. Click the pull-down menu to select a Module Category
3. Select 'NRW Water – R6 SMART' **Note:** All the Water options will begin with NRW.
4. Click the pull-down menu to select a Business Area
5. Select 'Main Queries and Reports'.
6. From the list of templates provided, select the R6_SMART_Data_Dump query.



7. Click the Copy To New button located in the upper right to copy the template to your area. The following box will appear on your screen.



8. Enter a new name for the query. The Copy to New process requires you to enter a name. Duplicate names are not allowed. Do not include characters such as &, ‘,/ ,* in your query name. A suggested name would be the name of the query plus your initials, for example, Data_Dump_hb as shown above.
9. Click OK. The query will open in the Design View.
10. Before running the query, it is suggested that you filter it for a particular HUC, survey date, LLID, or stream name. This will limit the query to a smaller set of records. For more information on filtering, refer to **Appendix A**. Note: If you are unsure of what HUC number or LLID your survey was on, then run the R6_SMART_Reach_Location_Summary_t to get those numbers.
11. Click the Run icon, , to run the query.
12. Check for errors. Errors will have to be corrected from the Water forms. They cannot be corrected in the Access query. For more information on how to check for errors refer to **Appendix B**.
13. Use the X in the upper right corner of the query to close it and return to the ad hoc query/reports manager form to select another query. **Warning:** Make sure to click the X for the query, not the X for the Access Tool, which will close the Access Tool.

Appendix A – Filtering

You can limit the data that is returned in any query, or you can have the entire dataset from NRIS Water (for your forest) returned. If you want the entire dataset, just run the query as is (don't enter any criteria).

If you want to limit your data set, read the instructions below. Common filtering items such as HUC, LLID, Stream Name, Survey Date, Survey Year, or Survey Reach are displayed.

General Tips for Filtering in Access:

1. All criteria must be entered exactly as it appears in the database (including capitalization and spaces), if you make an error no records will be returned.
2. It is far easier and more accurate to Copy/Paste the criteria into the Criteria row of the Design Grid rather than type it. You can copy from many sources including Word documents, the Water forms, Excel, or the results of an Access query (the Datasheet View).
3. When querying for a particular Unnamed trib you must use the LLID. The most accurate way to get the correct LLID is to copy it from the Water forms.
4. The asterisks (*) is the wildcard and can be very helpful if you are not sure how something is spelled.
5. Access frequently fills in the correct format such as quotation marks.

Limit your data request:

Most of the final queries will allow the user to limit the amount of data that is reported. Any field or column in a query can be used to limit the query. We suggest using a few of these for limiting the amount of data in the results of queries and reports.

Handy Query:

Before filtering, run the **R6_SMART_Reach_Location_Summary_t** query and leave it open or minimized. This query lists all of your stream survey data in NRIS Water. It lists the HUC, LLID, Survey Date, Survey Year, Protocol, Stream Name, and Reach. You will want to save this query because you will need the information it contains for later.

Use this query to copy HUC numbers, LLIDs, or stream names and then paste them into the criteria row of the queries you want to filter.

Limiting by HUC:

Using the HUC will give you all of the information for a particular HUC.
To get all the data in a 6th field subwatershed:
Put your cursor in the criteria row of the HUC field.
Type: the 12 digit number HUC number (Access will fill in the rest)

Field:	Protocol_Name	HUC	Survey_Date: Date	Stream_Name: Name
Table:	R6_SMART_Reach_	R6_SMART_Reach_	R6_SMART_Reach_	R6_SMART_Reach_Location_Data
Sort:		Ascending	Ascending	Ascending
Show:	☑	☑	☑	☑
Criteria:		"170102090605"		
or:				

To get all the data in a 5th field watershed:
Put your cursor in the criteria row of the HUC field.
Type: the 10 digit number HUC number and the asterisk (Access will fill in the rest)

Field:	Protocol_Name	HUC	Survey_Date: Date	Stream_Name: Name
Table:	R6_SMART_Reach_	R6_SMART_Reach_	R6_SMART_Reach_	R6_SMART_Reach_Location_Data
Sort:		Ascending	Ascending	Ascending
Show:	☑	☑	☑	☑
Criteria:		Like "1701020906*"		
or:				

To get all the data in a 4th field subbasin:
Put your cursor in the criteria row of the HUC field.
Type: the 8 digit number HUC number and the asterisk (Access will fill in the rest)

Field:	Protocol_Name	HUC	Survey_Date: Date	Stream_Name: Name
Table:	R6_SMART_Reach_	R6_SMART_Reach_	R6_SMART_Reach_	R6_SMART_Reach_Location_Data
Sort:		Ascending	Ascending	Ascending
Show:	☑	☑	☑	☑
Criteria:		Like "17010209*"		
or:				

Limiting by Stream Name:

You can limit your data by your stream. If you have done multiple surveys on the same stream you will the get information for all of the surveys.

Type the name of the stream if you know how it is spelled:

Field:	Protocol_Name	HUC	Survey_Date: Date	Stream_Name: Name
Table:	R6_SMART_Reach_	R6_SMART_Reach_	R6_SMART_Reach_	R6_SMART_Reach_Location_Data
Sort:		Ascending	Ascending	Ascending
Show:	☑	☑	☑	☑
Criteria:				"Yellowjacket Creek"
or:				

Type part of the stream name and use an asterisk:

Field:	Protocol_Name	HUC	Survey_Date: Date	Stream_Name: Name
Table:	R6_SMART_Reach_	R6_SMART_Reach_	R6_SMART_Reach_	R6_SMART_Reach_Location_Data
Sort:		Ascending	Ascending	Ascending
Show:	☑	☑	☑	☑
Criteria:				Like "Yellow*"
or:				

There is a potential problem with using stream name alone to limit the data. Most forests have at least two streams with the same name, so if you only use stream name to limit your data you may get information you do not want. To solve this you can choose a specific subwatershed along with your stream, or enter the LLID in the criteria.

Limiting by LLID:

If your stream does not have a name in the NRIS Water dataset (e.g. it is Unnamed), you will have to use the LLID to limit your data to your stream. The most accurate way to get the correct LLID is to copy it from the AI Survey form and paste it into the criteria row.

Field:	LLID	Protocol_Name	HUC	Stream_Name: Name
Table:	R6_SMART_Survey	R6_SMART_Survey	R6_SMART_Survey	R6_SMART_Survey_Le
Sort:			Ascending	Ascending
Show:	☑	☑	☑	☑
Criteria:	"1137098479413"			
or:				

Limiting by Survey Date:

Many streams have been surveyed more than once. One can use the survey date to limit a set data. There is a potential problem in that a stream may have several different survey dates particular year can have a different date (each survey, reach, can have a different date). So for example you want all the data for Yellowjacket Creek gathered in 2001. It is safest to enter Yellowjacket Creek for the stream name, leave the survey date blank and enter 2001 in the year.

1. To query for a particular year

Put your cursor in the criteria row of the Date field.

Type: *1999 and hit the enter key (Access will fill in the rest as shown below)

Field:	HUC	Date	Stream_Name: Name
Table:	R6_SMART_Survey	R6_SMART_Survey	R6_SMART_Survey_Le
Sort:	Ascending	Ascending	Ascending
Show:	☑	☑	☑
Criteria:		Like "*1999"	
or:			

2. To query for 2 particular years of data

Put your cursor in the criteria row of the Date field.

Type: *1996 or *1999 and hit the enter key (Access will fill in the rest as shown below)

Field:	HUC	Date	Stream_Name: Name
Table:	R6_SMART_Survey	R6_SMART_Survey_Length_M	R6_SMART_Survey_Le
Sort:	Ascending	Ascending	Ascending
Show:	☑	☑	☑
Criteria:		Like "*1996" Or Like "*1999"	
or:			

3. To query for data between 2 dates

Put your cursor in the criteria row of the Date field.

Type: Between 1/1/1996 and 12/31/1998 and hit the enter key (Access will fill in the rest as shown below)

Field:	HUC	Date	Stream_Name: Name
Table:	R6_SMART_Survey_	R6_SMART_Survey_Length_Miles_t	R6_SMART_Survey_Le
Sort:	Ascending	Ascending	Ascending
Show:	☑	☑	☑
Criteria:		Between #1/1/1996# And #12/31/1998#	
or:			

Limiting by Reach:

The reach is the finest scale to which you can limit your data. This may be all the information you want to see, but you will need to enter at least a stream name otherwise you will end up with data for all the reaches with the same number on the Forest.

To get data for Reach 1 on Yellowjacket Creek enter the data as shown:

Field:	HUC	Date	Stream_Name: Name	Reach
Table:	R6_SMART_Survey_	R6_SMART_Survey_L	R6_SMART_Survey_Le	R6_SMART_Survey_
Sort:	Ascending	Ascending	Ascending	
Show:	☑	☑	☑	☑
Criteria:			"Yellowjacket Creek"	"01-0.000"
or:				

Appendix B – Error Checking Physical Stream Data

Use the R6_SMART_Data_Dump query to check for the following errors:

1. **Length –** Shorter than width (OK in plunge pools).

To find where measured length is less than measured wetted width, enter the following:

Field:	Measured_Length	Measured_Wetted_Width	Large_Wood: LARG
Table:	R6_SMART_Chunit_Length_Width_Dat	R6_SMART_Chunit_Length_	R6_SMART_Chunit_
Sort:			
Show:	☑	☑	☑
Criteria:	<[Measured_Wetted_Width]		
or:			

Note: The column name is in square brackets.

2. **Width –** Longer than length.

To find where measured wetted width is greater than measured length, enter the following:

Field:	Measured_Length	Measured_Wetted_Width	Large_Wood: LARG
Table:	R6_SMART_Chunit_	R6_SMART_Chunit_Length_	R6_SMART_Chunit_
Sort:			
Show:	☑	☑	☑
Criteria:		>[Measured_Length]	
or:			

Note: The column name is in square brackets.

3. **Depth –** Look for misplaced decimals and unusually deep units by sorting the column in descending order. Potential errors may be: pool depths 10 times greater than avg pool max depth or riffles deeper than avg pools max depth.
4. **Average Depth (if collected) –** Must be less than the max depth.

To find where average depth is greater than max depth, enter one of the following:

Field:	Max_Depth: MAX_DEPTH	Avg_Depth: AVG_DEPTH	Pool_Crest_Depth:
Table:	NRW_AI_SAMPLES_VW	NRW_AI_SAMPLES_VW	NRW_AI_SAMPLES_
Sort:			
Show:	☑	☑	☑
Criteria:		>[MAX_DEPTH]	
or:			

Or

Field:	Max_Depth: MAX_DEPTH	Avg_Depth: AVG_DEPTH	Pool_Crest_Depth:
Table:	NRW_AI_SAMPLES_VW	NRW_AI_SAMPLES_VW	NRW_AI_SAMPLES_
Sort:			
Show:	☑	☑	☑
Criteria:	<[AVG_DEPTH]		
or:			

5. **Pool Crest Depth –** Must be less than max depth.

To find where pool crest depths are greater than max depths, enter the following:

Field:	Max_Depth: MAX_DEPTH	Avg_Depth: AVG_DEPTH	Pool_Crest_Depth:
Table:	NRW_AI_SAMPLES_VW	NRW_AI_SAMPLES_VW	NRW_AI_SAMPLES_
Sort:			
Show:	☑	☑	☑
Criteria:			>[MAX_DEPTH]
or:			

Note: The column name is in square brackets.

6. **Bank Stability –** Do left and right bank add up to the Total?
    - **Count of measured unstable bank records -** at least 85% of count of SO in reach.
7. **Woody Debris –** A number must be present in these fields. If no wood was observed a 0 should have been entered.
    - **Look at unusual wood numbers –** Tally marks interpreted as a number (suspect numbers are 11, 111, and1111 if tally marks are used on datasheet).
8. **Count of "Measured Units" (Bankfull Measures) -** at least 10% of count of units in stream preferably in reach or survey.
    - Check to see if measured units correspond with estimates.
9. **Pebble Counts –** at least two per reach.
10. **Bankfull Width** – Must be greater than wetted width.

    To find where the BF Width is less than the Measured Wetted Width enter the following:

Field:	Small_Wood: SMALL	BF_Width: BANK_FULL_WIDTH	Max_BF_Depth: MA
Table:	R6_SMART_Chunit_	NRW_AI_CHANNEL_MORPHOLOGIES_VW	NRW_AI_CHANNEL_
Sort:			
Show:	☑	☑	☑
Criteria:		<[Measured_Wetted_Width]	
or:			

Note: The column name is in square brackets.

11. **Floodprone width** – Must be greater than bankfull width.

To find where floodprone width is less than bankfull width, enter the following:

Field:	BF_Width: BANK_FULL_WIDTH	Max_BF_Depth: MA	Floodprone_Width: FLOODPRONE_WIDTH
Table:	NRW_AI_CHANNEL_MORPHOLOGIES_VW	NRW_AI_CHANNEL_	NRW_AI_CHANNEL_MORPHOLOGIES_VW
Sort:			
Show:	☑	☑	☑
Criteria:			<[BANK_FULL_WIDTH]
or:			

Note: The column name is in square brackets.

Use the R6_SMART_Chunit_BF_Measurements query to check for the following errors:

1. **Bankfull Depth –** Less than or equal to bankfull max depth.

To find where the bankfull depths are greater than the max bankfull depth, enter the following:

Field:	Bankfull_Width: BAI	Max_Bankfull_Depth: MAX_BANK_FULL_DEPTH	Floodprone_Width:	Bankfull_Depth: BANK_FULL_DEPTH
Table:	NRW_AI_CHANNEL	NRW_AI_CHANNEL_MORPHOLOGIES_VW	NRW_AI_CHANNEL	NRW_AI_XSEC_DATA_VW
Sort:				
Show:	☑	☑	☑	☑
Criteria:				>[MAX_BANK_FULL_DEPTH]
or:				

2. **Bankfull Depth –** There should be at least 3 bankfull depths per channel unit.
3. **Bankfull Depth –** Is not zero.

Use the R6_SMART_Special_Case_Unit_Bubble_Comments query to check for the following errors:

- **Special Cases –** All ‘CHUNIT’ and ‘ARTIFIC’ channel units must have a comment in the comment bubble. To check special cases may be easiest to sort the channel unit and subject name columns to look for omissions.

  As shown below, all special case ‘CHUNIT’ should have a comment subject name called ‘HABITAT_TYPE’ with comment text describing what the ‘CHUNIT’ is:

Sequence	Channel_Unit	SUBJECT_NAME	COMMENT_TEXT
48	CHUNIT	HABITAT_TYPE	DRY CHANNEL
50	CHUNIT	HABITAT_TYPE	DRY CHANNEL
51	CHUNIT	HABITAT_TYPE	DRY CHANNEL
53	CHUNIT	HABITAT_TYPE	DRY CHANNEL
54	CHUNIT	HABITAT_TYPE	DRY CHANNEL

  As shown below, culverts are entered as special case ‘ARTIFIC’ and should have a comment subject name called ‘HABITAT_CULVERT_TYPE’ with comment text describing what kind of culvert it is:

Sequence	Channel_Unit	SUBJECT_NAME	COMMENT_TEXT
19	ARTIFIC	HABITAT_CULVERT_TYPE	OPEN ARCH
113	ARTIFIC	HABITAT_CULVERT_TYPE	ROUND PIPE
631	ARTIFIC	HABITAT_CULVERT_TYPE	OPEN ARCH
817	ARTIFIC	HABITAT_CULVERT_TYPE	ELIPTICAL
132	ARTIFIC	HABITAT_CULVERT_TYPE	
726	ARTIFIC	HABITAT_CULVERT_TYPE	ELIPTICAL

  Note: Sequence 132 needs to have a comment added.

Use the R6_SMART_Regional_Variables_Chunit query to check for the following errors:

- **Regional Variables –** Make sure all fields are entered between the pound signs if you did look for the item.
  As shown below, several substrate estimates were entered. There are three data entry errors:
  First arrow: Entered the date and time in the wrong regional variable field.
  Second arrow: The correct way to enter the data is #0#0#90#0#10#.
  Third arrow: The correct way to enter the data is #33#12#85#0#0#, the zeros indicate that you looked for boulders and bedrock but none were found.

SO	Substrate_Est	Pct_Sand_txt	Pct_Gravel_txt	Pct_Cobble_txt	Pct_Boulder_txt	Pct_ Bedrock_txt
3		#Error	#Error	#Error	#Error	#Error
3		#Error	#Error	#Error	#Error	#Error
3	08/15/2000 0900	#Error	#Error	#Error	#Error	#Error
3		#Error	#Error	#Error	#Error	#Error
4	#20#30#40#10#0#	20	30	40	10	0
4	#000#000#090#000#010#	000	000	090	000	010
4		#Error	#Error	#Error	#Error	#Error
4		#Error	#Error	#Error	#Error	#Error
4	#33#12#85#	33	12	85	#Error	#Error
4		#Error	#Error	#Error	#Error	#Error
4	#20#20#20#20#20#	20	20	20	20	20
4		#Error	#Error	#Error	#Error	#Error
4		#Error	#Error	#Error	#Error	#Error

As shown below, some fields were omitted and there is an error in row two. There is a three-digit code (MOS) this is most likely an error. The correct way to enter the data is #GF#MO#SS####.

Riparian_Info	In_Rip_Size	In_Rip_Overst	In_Rip_Unders
#######			
#GF#MOS#S####	GF	MOS	S
#######			
#SS#HA#HA####	SS	HA	HA
#SS#HA#####	SS	HA	
#######			
#######			
#GF######	GF		
#######			

Use the R6_SMART_Reach_Location_Summary_t query to check for the following errors:

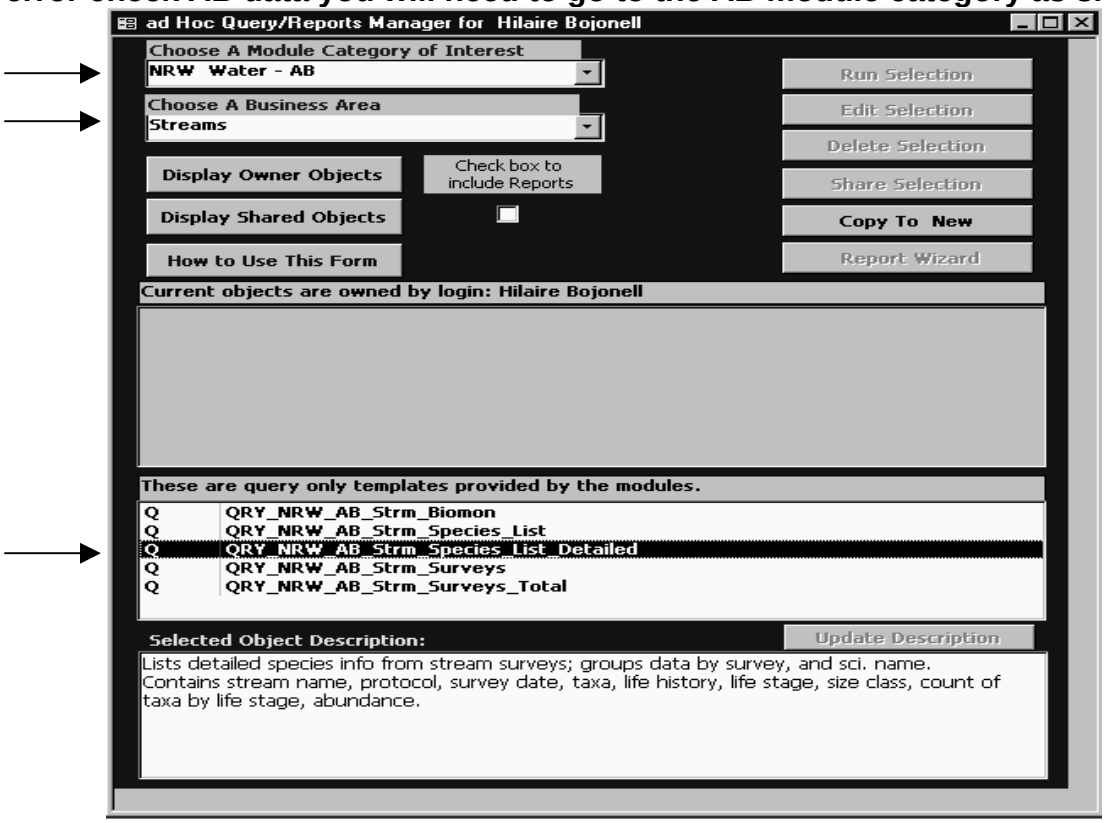
1. Check SO's to make sure they are in the correct reaches.
2. Check Spread between From and To SO's - This should be no greater than the counts of SO.

As shown below, SO 144 is missing between Reach 01-04 and 01-05. This could be an error that needs to be corrected. **WARNING:** Never renumber the SO if there is AB data attached at any SO in the reach because the AB data will be linked to the wrong SO number. If you need to correct SO numbers that have AB data attached, call the NRIS Air/Water Helpdesk.

Reach	From_RM	To_RM	From_SO	To_SO	SO_Count
01-01	6.2	7.5	1	13	13
01-02	7.5	9.5	14	90	76
01-03	9.5	10.4	91	95	5
01-04	10.4	10.9	96	143	48
01-05	10.9	11.6	145	186	41

Appendix C – Error Checking Biotic Data

To error check AB data you will need to go to the AB module category as shown:



Use the QRY_NRW_AB_Strm_Species_List_Detailed query to check for the following errors:

1. Check that the correct protocol was used for count vs. presence surveys
2. Check that presence surveys only have a count of 1 or 0

species : Select Query

Protocol	Survey_Start	Taxa_Reference_Class	Scientific_Name	Life_Stage	Size_Class	COUNT_OF_TAXA	Life_History_Type
R6 Westside AI_AB Presence	8/9/2000	FISH	Oncorhynchus myki	JUVENILE	ALL	1	ND
R6 Westside AI_AB Presence	8/9/2000	FISH	Oncorhynchus	ADULT	ALL	1	ND
R6 Westside AI_AB Presence	8/9/2000	FISH	Oncorhynchus	JUVENILE	ALL	1	ND
R6 Westside AI_AB Presence	8/9/2000	FISH	Oncorhynchus	ADULT	ALL	1	ND
R6 Westside AI_AB Presence	8/9/2000	FISH	Oncorhynchus	JUVENILE	ALL	1	ND
R6 Westside AI_AB Presence	8/9/2000	FISH	Oncorhynchus myki	ADULT	ALL	1	ND
R6 Westside AI_AB Presence	8/9/2000	FISH	Oncorhynchus myki	JUVENILE	ALL	1	ND
R6 West Pre96 AI_AB Count	7/13/1993	FISH	Oncorhynchus myki	ADULT	ALL	0	ND
R6 West Pre96 AI_AB Count	7/13/1993	FISH	Oncorhynchus myki	JUVENILE	ALL	1	ND
R6 West Pre96 AI_AB Count	7/13/1993	FISH	Oncorhynchus myki	JUVENILE	ALL	3	ND
R6 West Pre96 AI_AB Count	7/13/1993	FISH	Oncorhynchus myki	JUVENILE	ALL	6	ND
R6 West Pre96 AI_AB Count	7/13/1993	FISH	Oncorhynchus myki	ADULT	ALL	0	ND
R6 West Pre96 AI_AB Count	7/13/1993	FISH	Oncorhynchus myki	JUVENILE	ALL	4	ND
R6 West Pre96 AI_AB Count	6/27/1994	FISH	Oncorhynchus clarki	ADULT	ALL	1	ND
R6 West Pre96 AI_AB Count	6/27/1994	FISH	Oncorhynchus clarki	JUVENILE	ALL	1	ND
R6 West Pre96 AI_AB Count	6/27/1994	FISH	Oncorhynchus myki	ADULT	ALL	2	ND
R6 West Pre96 AI_AB Count	6/27/1994	FISH	Oncorhynchus myki	JUVENILE	ALL	1	ND

Must be 1 or 0

As shown below you can filter the query to only show you ‘Presence’ surveys where the count is greater than 1.

Field:	Segment_ID: ID	Protocol: PRTCL_NA	Survey_Start: SU	Taxa_Reference_Cl	Scientific_Name:	Life_Stage: TLFS	Size_Class: TSZCLT	COUNT_OF_TAXA
Table:	NRW_LOCATION_C	NRW_PROTOCOLS_	NRW_AB_SURVE	NRW_AB_LIFE_STA	NRW_AB_TAXAS	NRW_AB_SAMPL	NRW_AB_SAMPLE_I	NRW_AB_SAMPLE_I
Sort:	Ascending	Ascending	Ascending		Ascending	Ascending		
Show:	☑	☑	☑	☑	☑	☑	☑	☑
Criteria:		Like "*Presence"						>1
or:								