Clearwater Resource Conservation and Development Council, Inc.
P.O. Box 9576, Moscow, ID 83843-0176 (208) 669-0975

The Clearwater RC&D Council’s mission is to provide leadership in building local collaborations for sustainable community and resource development that will improve the quality of life for residents of north-central Idaho.

Clearwater Basin Collaborative
Selway-Middle Fork CFLRP Project

Request for Proposals: Aquatic Habitat Condition Assessment and Fish Population Monitoring

Background and Introduction

The Clearwater Resource Conservation and Development Council, Inc. (RC&D) is a non-profit organization that sponsors the Clearwater Basin Collaborative (CBC).

The CBC is a collaborative effort comprised of representatives from local and state governments, conservation groups, timber products industry, the Nez Perce Tribe, motorized interests, sportsmen, and local citizens. Our vision is to enhance and protect the ecological and economic health of the forests, rivers and communities within the Clearwater Basin. For further information about us, please visit our website at www.clearwaterbasincollaborative.org.

In March of 2009, President Obama signed the Forest Landscape Restoration Act (FLRA) into law under Title IV of the Omnibus Public Lands Act of 2009, establishing the Collaborative Forest Landscape Restoration Program (CFLRP) (http://www.fs.fed.us/restoration/CFLRP/). The purpose of CFLRP is to implement and monitor collaborative, science-based ecosystem restoration of priority forest landscapes over a 10-year period. The Clearwater Basin’s Selway - Middle Fork CFLRP Project is one of twenty-three selected nationwide for inclusion in this program. Through the auspices of the Clearwater RC&D, the CBC has hired a CFLRP Project Coordinator, who will be the point of contact for this project.
A crucial component of the CFLRP involves a multi-party monitoring, evaluation and accountability process to assess the positive or negative ecological, social and economic effects of the project implementation. Monitoring will be used in an adaptive management framework to ensure that forest restoration treatments meet ecological, social, and economic objectives.

**Project Objectives**

The objective of the Selway-Middle Fork CFLRP Project’s ecological monitoring activities is to document the degree to which various restoration treatments within the CFLRP project area achieve their ecological and watershed health objectives.

The specific objective of the Aquatic Habitat Condition Assessment and Fish Population Monitoring project is to provide an inventory of habitat conditions, establish a baseline for impact analyses, and to document fish distribution and relative abundance in the Clear Creek watershed on the Nez Perce-Clearwater National Forest near Kooskia, Idaho. Results from the assessment will serve as a reference point for comparison with future surveys to evaluate habitat conditions and processes, water quality parameters, and population changes over time as a result of resource management in the basin. Of particular importance is the current spatial distribution and relative abundance of the salmonid species. While the usefulness of population trend information is limited due to influences outside of the Forests’ control, the location of quality habitat for steelhead and salmon spawning and rearing, overall importance of the drainage for these species, and existence of upstream barriers will inform resource management decisions within the watershed.

**Project Location**

The project is located within the CBC's Selway-Middle Fork CFLRP project area (see overview map of entire CFLRP project area in Appendix A). The Aquatic Habitat Condition Assessment and Fish Population Monitoring project is specific to the Forest Service-managed portion of the Clear Creek watershed (see detailed project map in Appendix A).

The Clear Creek drainage lies within the Middle Fork of the Clearwater River near the town of Kooskia, Idaho. Landforms in the project area are mostly steep dissected mountain slopes (58% of the area) and low and moderate relief rolling uplands (33%).

The Clear Creek drainage contains a minimum of 223 miles of mainstem and tributary streams. Of these, about 65 miles are fish bearing and occur on Forest Service managed lands. Habitat for westslope cutthroat trout occurs widely throughout the area well into the headwaters of most streams. Steelhead trout, a threatened species listed under the Endangered Species Act occur in the lower and middle reaches. As a result, there are 35 miles of designated critical habitat for steelhead on Forest Service lands in the drainage. Spring chinook salmon also occur in the lower and middle reaches of Clear Creek. Very low densities of bull trout (ESA threatened) are expected based on past surveys. There is no recent information available on the densities of the fish species within the drainage.

Access into the areas to be surveyed under this proposal can be difficult with much of the area only accessible by foot or pack stock. The most difficult access is into lower Clear Creek from the Forest boundary east to Trail 728 and most of the South Fork Clear Creek drainage (see attached map). There are no trails adjacent to these segments of streams and few roads in these areas. The following trails were maintained in 2010 but have not been cleared since then: 723, 728, 130 and 150. They are however locatable and useable. Trails 197 and 139 have not been maintained and are most likely not locatable. Access to streams in their vicinity would require bushwhacking. The ridgetops are relatively
flat and easy walking. Slopes leading down the streams are moderate to relatively steep and are heavily vegetated by trees and shrubs.

**Scope of Work**

The goal of the project is to implement field surveys to assess stream channel and aquatic habitat conditions and fish resources in approximately 65 miles of riverine habitat in the Clear Creek watershed. The scope of work includes the study design, implementation, analysis and reporting, and coordination and project management.

The scope is intended to meet the following project goals:

- Describe current stream channel and fish habitat conditions
- Identify potentially suitable salmon and steelhead spawning habitat
- Determine spatial distribution and relative abundance of salmonids
- Identify and evaluate potential barriers to fish migration
- Establish baseline datasets for determining impacts to aquatic habitat that can be attributed to the implementation of land management activities
- Establish and monument 5 permanent monitoring stations for the evaluation of potential changes to the physical habitat (e.g. spawning gravels), the physical processes (e.g. channel aggradation/degradation), and relevant water quality parameters (e.g. stream temperature)

**Develop the Study Design**

The study design should be comprised of at least the following three elements:

1. an attributed GIS stream channel network and compilation of relevant GIS layers to inform assessment,
2. a sampling framework considering relevant scales (e.g., monitoring station, reach, habitat unit) for sampling and interpretation, and
3. a detailed field protocol.

All elements of the study design must be approved by the Nez Perce-Clearwater National Forest prior to implementation. Contractor must use geographic information system (GIS) as a spatial framework to inform field surveys, support spatial analysis of the survey data, and present results of surveys within the spatial context of the Clear Creek basin. Data will be collected in such a way that it can be spatially represented in ArcMap. Global positioning systems (GPS) will be used to document the locations of key information in the field such as monitoring stations and cross-sections, habitat unit boundaries, reach-level field measurements, relative abundance sampling, potential migration barriers, and other survey elements. GPS data will be integrated with the GIS, and data layers developed for use with data analysis and the presentation of results.

Aquatic habitat survey data must be compatible with data collected as part of the Pacfish/Infish Biological Opinion (PIBO) such that they can be compared to the Riparian Management Objectives for bank stability, and width:depth ratio as outlined by PACFISH (http://www.fs.fed.us/biology/fishecology/new.html#pibo_reports). In addition, the Contractor must include stream gradient, percent of pools, riffles and runs, percent canopy cover, dominant vegetation type (trees/shrubs), substrate composition including measures of cobble-embeddedness and locations...
of concentrations of spawning habitat for chinook salmon and steelhead trout in the study design. The Forests are currently monitoring stream temperature in Clear Creek; thus, that element will only be collected at the monitoring stations.

The sampling framework and protocols should follow the Oregon Department of Fish and Wildlife (ODFW) Aquatic Inventories Project Methods for Stream Habitat Surveys Protocol (http://oregonstate.edu/dept/ODFW/freshwater/inventory/pdffiles/hmethd14.pdf) or a similar protocol that maps stream habitats in a longitudinal fashion along the length of project area streams. See Exhibit B for a summary of ODFW data collected. The following exceptions to the ODFW protocol are:

For the Riparian Assessment portion of the survey, the belt transect methodology is limited to the first 0-10 meters (Zone 1) from the stream. No survey would be conducted for the 10-20 meter (Zone 2) or 20-30 meter (Zone 3) portions of the riparian area. Information on the grass and forb cover, duff and rock cover, and tally of trees by size class (count) is also not collected.

All upstream migration barriers to salmonids should be recorded. Information required includes the height, width and length, and cause of the barrier (rock/wood...) as well as a recorded GPS point.

In addition, the following data needs to be collected in order to obtain information on potential concentrations of spawning habitat for resident fish (cutthroat and bull trout) and anadromous fish species (steelhead trout and spring chinook salmon).

**Spawning Gravel Methodology**

All potential spawning habitat for resident and anadromous fish is estimated in each habitat unit. Also record the general condition of the spawning habitat (good, fair, poor) as defined below.

General spawning gravel identification is dependent of three factors:

1. **Spawning size gravels** with cobble embeddedness < 50%.

2. Located within close **proximity to cover and resting pools**. Desirable spawning habitat will include a pool area of sufficient depth (> 0.6 m) and cover (undercut banks, boulders, and logs) to provide shelter and rest within 30.5 m up or downstream of the spawning gravels.

3. Located in moderate current **velocities**. Surface velocities of 0.2-0.6 m/sec are considered optimum and desirable for spawning activity and incubation requirements.

Data collected should include:

**Species:**

- Resident trout (rainbow, cutthroat, and bull trout)
- Steelhead trout
- Chinook salmon
Criteria for gravel and redd size

Resident species

Gravel size range: 0.6-6.4 cm (1/4" - 2.5")
Optimum size range: 1.3 - 3.8 cm (0.50 - 1.50 in).
Minimum redd size is 0.3 m (1 ft) in diameter.

Anadromous species (steelhead and chinook)

Gravel size range: 0.6-15.2 cm (1/4" - 6.0")
Optimum size range: 3.8 - 10.2 cm (1.5" - 4.0")
Minimum redd size is 1 m (3 ft) in diameter.

Condition of the spawning area:

Good = All three components are optimum (gravels, pools, velocity)
Fair = Proper gravel size; pools and velocities marginal
     OR cobble embeddedness is 50 - 75%
     OR gravel size is marginal for fish species potentially present,
        pools and velocity optimum
Poor = Marginal gravel size; pools absent or of poor quality (shallow/no
      cover); and velocities are excessive (> 0.9 m)
     OR cobble embeddedness >75%
     OR spawning gravels are partially exposed to air

Area of the streambed covered in spawning gravel (with the minimum redd size
criteria mentioned above):

Assess spawning areas during low flow conditions for Chinook salmon,
bull trout, and cutthroat trout.

Extrapolate for high flow conditions for steelhead and resident rainbow.

Locate the high water channel mark (bankfull) and estimate the gravels
that would remain watered until mid-July.

It is possible to rate gravels within one unit as more than one category. For
example, Chinook gravels in one habitat unit can also be used by steelhead.

Spawning gravel locations need to be identified with a waypoint and transferred
to a GIS layer with the associated attribute table that includes the above data.

For the fish distribution and relative abundance surveys, Contractor will use a modified Hankin and
Reeves (1988) phased sampling approach where a relatively large subset of habitat units are sampled
using single-pass snorkel counts, and a relatively small subset of habitat units are sampled using
multiple-passes (e.g., 3-pass). This approach allows variance and confidence intervals to be estimated,
and improves the ability to detect meaningful differences over time. The sampling frequency for each
phase will be set to reasonable values (e.g., 80% phase 1 and 20% phase 2) based on discussions with
the Nez Perce-Clearwater National Forests’ Fisheries Biologist, and may be adjusted based on analysis of
initial sampling data. This approach supports gathering basic information over the entire basin (e.g., fish

Page 5 of 17
distribution), as well as more detailed information (e.g., relative abundance) at a sub-set of habitat units in the basin.

The Contractor will establish 5 monitoring stations at the following general locations (see Monitoring Stations map in Appendix A):

1. Mainstem of Clear Creek at the U.S. Forest Service boundary
2. West Fork Clear Creek, below the confluence with Lost Mule Creek and above the confluence with the mainstem Clear Creek
3. Mainstem Clear Creek above the confluence with Middle Fork Clear Creek
4. Middle Fork Clear Creek above the confluence with the mainstem Clear Creek
5. South Fork Clear Creek, above the confluence with mainstem Clear Creek, but below the confluence with Kay Creek

The exact locations of the monitoring stations will be determined in the field based on site characteristics and access, but must be permanently monumented, photographed, and have GPS points documented. The variables evaluated at each monitoring station will include stream channel physiography, water temperature, stream bed surface substrate, cobble embeddedness, and electrofishing according to the following procedures.

- **Stream channel physiography** (the basis for these measurements are described in Harrelson, et al. (1994)):
  - Each monitoring station will have three (3) monumented cross-sections. The cross-sections are spaced 100-feet apart (measured at the thalweg).
  - Each monitoring station will have one thalweg/longitudinal profile, starting at the downstream monumented cross-section, and extending upstream for a distance of 500-feet. The endpoint of the thalweg/longitudinal profile will be monumented.
  - Stream discharge will be measured in order to calibrate Manning’s roughness coefficient necessary for calculating sediment transport capacity.

- **Stream bed surface substrate**: 
  - Bed surface substrate is measured using a modified Wolman Pebble Count procedure described in Harrelson, et al. (1994). The modifications are as follows:
    - Pebbles are measured in a zig-zag pattern, starting at the downstream monumented cross-section, and continuing to the upstream end of the monumented thalweg/longitudinal profile.
    - Measurements of the medial axis are measured and recorded to the nearest millimeter; not tallied into Wentworth phi-classes.
    - A minimum of 300 particles will be measured at each station.

- **Cobble embeddedness** (procedures described in Stille and King (1989)):
  - Three measurements will be conducted at each of the stream channel cross section locations taken at 25%, 50%, and 75% locations within the cross-section width. A total of 9 measurements will be taken at each station.
• Temperature:
  o Each monitoring station will have two continuously recording thermographs; one completely submerged in the stream channel recording water temperature and one in a nearby upland area recording air temperature.
  o Stream temperatures will be recorded at least through the summer months May thru September; but may be recorded year-round. The Nez Perce – Clearwater National Forest will provide the temperature monitoring units for installation by the Contractor.

• Electrofishing (procedures described in Hankin and Reeves (modified 1988)):
  o Electrofishing will be conducted at each station.

**Implementation**

There is approximately 65 miles of stream on the Nez Perce-Clearwater National Forests that will be surveyed to characterize habitat conditions and fish distribution and relative abundance. Due to the remote location of the Clear Creek basin, it will be necessary for field crews to conduct field surveys and camp on-site for multiple consecutive days at a time. Field surveys will be conducted during a single field season (approximately May–September) to provide a “snapshot” of habitat conditions and reduce the risk of substantial changes occurring from one year to the next.

**Analysis and Reporting**

Data analysis and reporting will include descriptive, tabular, and graphic summaries of aquatic habitat attributes defined in the field protocols. Where appropriate, aquatic habitat survey data should be compared to the Riparian Management Objectives benchmarks outlined by PACFISH including: pool frequency, large woody debris pieces per mile, bank stability, and width/depth ratio. Maps should be used to display the spatial distribution of surveyed attributes (or metrics) when appropriate, particularly at the reach scale.

In addition to tabular data, narrative field summaries for stream channel physiography, stream bed surface substrate, and cobble embeddedness should also be included as part of the package of data collected at each of the 5 monitoring stations. Fish density information collected at these stations should also be included in the transect summaries. Summaries for fish information should include total fish counts and densities by species and by age class.

A draft and final report will be prepared with the goal of describing current habitat and water quality conditions, the distribution of Chinook salmon and steelhead within Clear Creek, and identifying where the best habitat is located for steelhead and salmon spawning and rearing. The habitat unit, fish distribution, and relative abundance information should be summarized by the individual reaches identified during the survey for each of the named drainages. Summaries for fish information should include total fish counts and densities by species and by age class. The results are intended to allow comparison with regional data and to establish the relative importance of Clear Creek for Chinook salmon and steelhead populations. Comparison of the information reported from this assessment with subsequent surveys will allow the determination of whether fish habitat conditions are changing over time.

Contractor will be required to attend and present this project at two meetings of the Selway-Middle Fork CFLRP Monitoring Advisory Committee (MAC) located in the Clearwater Basin (Kamiah or Lewiston, Idaho). The first meeting will occur in the fall of 2014 and focus on the preliminary study design. The second will occur in the fall of 2015 and focus on the outcomes and findings of the project.
Deliverables

Study Design

- Technical documentation describing sampling framework
- Technical documentation describing detailed sampling protocol
- Data collection field forms and/or explanation of field codes used for electronic data collection
- Specifications for equipment to be used for data collection purposes

Implementation

- Monthly progress reports
- Photographs of field work including start locations of each survey reach, monitoring station, migration barriers, candid shots for report/presentations, and any other interesting findings

Analysis and Reporting

- Draft and final report (electronic submission)
- Electronic files including GIS data layers for monitoring stations, survey reaches, surveyed habitat, fish distribution, and migration barriers, database(s) in Access format, and raw data sheets
- Summary sheets for each of the 5 transect monitoring stations including longitudinal profile and cross section drawings
- Powerpoint presentations at Monitoring Advisory Committee meetings

Contract Information and Terms

The term of the contracting period will be October 2014 through December 2015. This contract will be offered on a lump sum basis with payment contingent upon reaching project milestones.

The contractor will be required to demonstrate an in-kind match contribution equivalent to 10% of the total budget. In-kind contributions are non-cash donations provided by non-Federal third parties. These can be in the form of labor, equipment, supplies, services, and other expendable property. An outline of how the contractor intends to meet this requirement must be provided in the proposal.

The CBC Selection Committee, convened by and accountable to the CBC Working Group, will evaluate proposals and choose the one that offers the most value to the goals and objectives of the CFLRP project.

Responsibilities and Accountabilities

The final contract(s) will be administered by the Clearwater RC&D. The successful applicant(s) will report directly to the CBC’s CFLRP Project Coordinator.

- The contractor shall provide own vehicle, with valid driver’s license and current insurance, necessary to complete this contract.
- Contractor will perform all work as an independent contractor, and shall under no circumstances be considered or deemed an employee of the Clearwater Resource Conservation and Development Council, Inc.
- Contractor shall comply with all state and federal laws, rules and regulations relating to performance of work under this Contract.
• Invoices submitted to the Clearwater RC & D Council, Inc. will include documentation of progress and itemization of work completed to date as well as in-kind match. Payment milestones will be outlined in the professional services contract.

• Contractor shall furnish all equipment, labor, materials, transportation, supervision, and incidentals necessary to perform the Scope of Work.

• The contractor will prepare and submit monthly progress reports to the CFLRP Coordinator.

• Successful applicant(s) will be asked to provide current certificates of liability and worker’s compensation insurance.

**Basic Qualifications Required**

• Applicant must have good technical writing skills.

• Applicant must have experience with sampling design and quantitative analysis.

• At the very least, the project manager must have a degree in a natural resources or related field and five or more years of professional experience.

• Ability to perform data processing, tracking, and editing functions using word processing and spreadsheet programs and ArcMap 10.1.

**Required Proposal Content and Format**

**Project Management and Budget**

• Provide a description of how the project will be managed.

• Describe the technical qualifications and experience of the project manager, key employees, and any subcontractors.

• Provide a detailed budget for completion of the scope of work and project deliverables. Include a recommendation for a payment schedule based on completion of milestones in the scope of work (i.e. 10% paid upon completion of approved study plan, etc.).

**Technical Approach**

• Describe the methodology that will be used to complete each element of the scope of work and all deliverables.

• Provide a basic schedule for completion of the scope of work.

• Describe proposed methodology for meeting and documenting the in-kind match requirement.

**Past Experience and Qualifications**

• Provide at least two short summaries of related past work experience.

• Provide the names, contact information, and a 3-5 sentence description of similar projects completed for at least 3 different references.

• Provide resumes for the project manager and key employees that will be working on this project if awarded. Also include the names and contact information of subcontractors if any are anticipated.

• Describe past work experience within and/or knowledge of the Clearwater Basin.
Selection Process

A Selection Committee will rank all proposals as submitted. The Selection Committee reserves the right to reject any and all proposals submitted.

The Selection Committee or its representatives reserve the right to request oral interviews with selected applicants.

This solicitation does not commit the CBC or the Clearwater RC & D Council, Inc. to pay any costs incurred by the applicant in the preparation or presentation of the proposals, including any interview time and expense. All responses to the Request for Proposal become the property of the CBC. The content of the proposals will be kept confidential until the selection of the successful applicant is publicly announced.

Upon selection of the successful contractor, the CBC co-chairs will coordinate with the Clearwater RC&D Council, Inc. to execute a professional services contract.

The Clearwater RC&D reserves the right to terminate the contract at any time of its choosing prior to its completion date. Should the Clearwater RC&D or CBC choose to effect such termination, individual shall be paid only through the current payment period in which the individual is working.

Review Criteria

Review criteria are not arithmetically scored or weighted.

Relevancy

- Does the proposal directly address the scope of work?
- Does the respondent demonstrate enough understanding of Scope of Work and associated protocols to add value to the project?
- Is the respondent a local firm or propose to hire local employees or subcontractors?

Technical Merit

- Are methods appropriate for stated objectives?
- Is methodology/approach provided sufficiently detailed to demonstrate an understanding of the full Scope of Work?
- Can accurate and appropriate conclusions be drawn based on applicant’s methods?

Products, Deliverables, and Science Application

- Does the respondent possess the necessary qualifications and experience to complete the proposed project?
- Has the respondent addressed each deliverable adequately?
- Will all deliverables be compatible with current Forest Service and CBC data management systems?

Feasibility

- Is the technical approach feasible under stated timeline and budget constraints?
- Does the respondent possess the necessary qualifications and experience to complete the proposed project?
• Are there barriers or regulations that might prevent the successful implementation of proposed projects?
• Is respondent’s proposal for meeting the match requirement feasible within the scope and timeline of the project?

**SUBMISSION OF PROPOSAL**

Please submit via email by October 17th, 2014 as a single pdf file to:

 coordinator@clearwaterbasincollaborative.org

Technical questions and/or clarifications about this Request for Proposal must be submitted in writing to coordinator@clearwaterbasincollaborative.org by September 26th, 2014. Responses to questions will be available at http://www.clearwaterrcd.org/whats-new/job-opportunities/ by October 3rd, 2014.

Review of proposals is scheduled to take place soon after the closing date. Applicants will be notified of the status of their proposal within 3 weeks of the closing date. If you have questions regarding this Request for Proposals, please call the CBC Coordinator at 208-827-0309.
THE ENTIRE CFLRP AREA INCLUDES PORTIONS OF THE NEZ PERCE-CLEARWATER AND BITTERROOT NATIONAL FORESTS AS WELL AS STATE, TRIBAL, AND PRIVATE LANDS.

THE PROPOSED PROJECT IS LIMITED TO THE PORTION OF CLEAR CREEK WITHIN THE NEZ PERCE-CLEARWATER NATIONAL FORESTS.
See attached Detailed Project Location Map for Full View
### Exhibit B – ODFW Basinwide Surveys Summary of Data Collected

#### Reach Information

1) Channel Form
   - Narrow Valley Form - Constrained by bedrock  
   - Constrained by hillslope  
   - Broad Valley Form- Unconstrained- single channel  
   - Unconstrained- anastomosing  
   - Unconstrained- braided  
   - Constrained- terraces  
   - Constrained- alternating terraces  
   - Constrained- land use (road/dike/landfill)

2) Valley Form- Steep V shaped
   - Moderate V shaped  
   - Open V shaped  
   - Constrained terraces  
   - Multiple terraces  
   - Wide Active flood plain

#### Valley width index

3) Streamside vegetation class-
   - None  
   - Annual grasses, herbs, forbs  
   - Perennial grasses, herbs, forbs  
   - Shrubs  
   - Deciduous dominated (>70%)  
   - Mixed conifer/deciduous (50:50)  
   - Conifer dominated

3a) Size Class-
   - Seedlings  
   - Young established trees  
   - Typical sizes for second growth stands  
   - Large trees in the stand  
   - Mature timber  
   - Old growth

4) Land Use-
   - Agriculture  
     - Domestic water supply watershed  
     - Mining  
     - Wetland  
     - Wild and Scenic area  
   - Timber harvest  
   - Young forest trees  
   - Second growth timber  
   - Large Timber  
   - Mature Timber  
   - Old growth forest  
   - Partial timber cut  
   - Forest fire  
   - Bug kill  
   - Light grazing pressure  
   - Heavy grazing pressure  
   - Exclosure
5) Water temperature (one time grab sample)
6) Stream Flow - Dry
   Low Flow
   High flow
   Flood flow
6) Stream Flow - Puddled
   Moderate Flow
   Bankfull flow
7) Location - T/R/Sec
8) Photo - beginning of each survey reach
9) Sketch - of valley form and cross section for each reach
10) UTM coordinates

**Unit Information**

1) Reach number
2) Unit types -
   Pools
   Plunge
   Lateral scour
   Dammed
   Straight Scour
   Trench
   Beaver dam

   Subunit pools - Alcove/ backwater/ isolated

   Glides
   Riffle
   Rapids - With protruding boulders
   Cascades - Over boulders
   Steps - Over Bedrock
          Over logs
          Beaver dam
          Over structure (man-made)

   Special unit types -
   Dry (subsurface flow)
   Dry channel (side channel)
   Beaver dam
   Puddled
   Culvert crossing

3) Channel types -
   No multiple channels
   Primary channel
   Side channel
   Isolated pools, alcoves, or backwater pools
   Secondary channel
4) Percent flow
5) Unit length
6) Unit width
7) Slope
8) Channel shade
9) Active channel height
10) Active channel width
11) Floodprone height
12) Floodprone width
13) Terrace height
14) Valley width index
15) Unit depth
16) Depth at pool tail crest
17) Substrate %- Silt/ sand/ gravel/ cobble/ boulders/ bedrock
18) Boulder count
19) Bank erosion
20) Undercut bank
21) Comment codes-
   Amphibian Bridge crossing
   Bridge Beaver dam
   Bug kill Beaver
   Culvert crossing Culvert entry
   Channelized streambanks Debris jam
   Fence crossing Gauging station
   Artificial habitat structure Mining
   Potential artificial barrier Potential natural barrier
   Road ford Screened diversion
   Spring or seep Tributary junction
   Unscreened diversion Wildlife use of stream or riparian zone
22) Mass movement-
   Earth flow Landslide Avalanche
23) Condition- Active Stabilized

**Wood Information (individual pieces measured and tallied)**

1) Diameter
2) Length
3) Notes (tree species/part of woody debris jam/ man-made structure...)

**Riparian Assessment**

Conducted using a belt transect (10m x 5m) across the riparian zone to the stream channel on each side.

1) Side of channel (left or right)

2) Surface-
   Floodplain Low terrace
   High terrace Hillslope
   Secondary channel Tributary channel
   Isolated pool Wetland or bog
   Road bed Railroad grade
   Riprap

3) Slope
4) Canopy closure
5) Shrub cover
6) Tree group-
   Conifer
   Hardwood
7) Notes