Culverts and Stream Ecology Table of Field Variables

Measureable Variable:	Measure with:	Method:	Useful for:
Macroinvertebrate community	D-nets, ID cards, field sheets, plastic tubs, plastic spoons, ice cube trays (**Protocol 12**)	Collect with D-nets, categorize with ID cards and ice cube trays.	Determining how many (and how many different types of) organisms are in the sampling location
Macroinvertebrate length	Clear plastic ruler, field sheet	(once the macroinvertebrates are collected and sorted…) measure the length from head to tail	Looking for species-specific size differences from site to site
Water temperature	Alcohol thermometer	Measure water temperature at water sampling site	Determining relationships between water temperature and other factors
Substrate	Caliper (ruler in a pinch) **(Protocol 6)**	Collect and record pebbles along a transect(s) across the sampling site	Determine the stream bottom type
Stream width and depth	Measuring tape, stadia rod, meter stick	Measure at multiple locations along sampling location	(Use with flow to calculate) Velocity also: use stream width and sampling location length to calculate stream bed area
Stream flow	Stopwatch, tape measure, orange or tennis ball OR flow meter	Time for object to travel a known distance OR per manufacturer's instruction	The speed of water movement at the site (and for comparison between sampling events)
Canopy cover	Densiometer **(Protocol 4)**	Measure canopy cover directly over the stream or in area around sampling site.	Amount of cover may affect the amount of precipitation that reaches the ground
Vegetation type	ID, field sheets, compass, tape measure (both large and small) **(Protocol 5)**	Collect data about the trees and shrubs a.) along transects that are perpendicular to the stream (at the sampling site), or b.) in $1/20^{th}$ acre plots.	Vegetation may change what comes into the streams
Stand density	ID, tape measure **(Protocol 5)**	Determine how many of any particular tree species are in the area around the sampling location.	May affect water chemistry
Elevation	Topo map	Locate sampling location on map, find elevation from contour lines	May affect temperature, amount of runoff, other factors
Aspect	Topo map, compass	Record whether the sampling site is N, S, E or W-facing	May affect temperature, effects of prevailing winds, amount of fog, other factors
Water quality parameters	Various probes- DO, pH, Conductivity, Turbidity	Use according to instructions. Record results.	Determines conditions for different organisms