STREAM DISCHARGE DATA SHEET

Please check the box next to the "Site #" ***if this is a new site and please be sure to attach a map.*** (PLEASE PRINT)

☐ Site # _____ Stream _____ County _____

Site Location _____

Date _____ Time (military time) _____ Rainfall (inches in last 7 days) _____ Water Temp. (°C) _____

Trained Data Submitter (responsible volunteer) _____ Stream Team Number _____

Trained Participants _____

Instructions for Calculation of Stream Discharge (Flow)

Select a section of stream that is relatively straight, free from large objects such as logs or large boulders, with a noticeable current, and with a depth as uniform as possible. Stretch the tape measure provided by the program across the stream. The "0" point should be anchored at the wetted edge of the stream. The end of the tape measure should be anchored at the opposite end so that it is taut and even with the other wetted edge.

☐ Stream Width (Feet)

Step 1: Determine stream cross-sectional area. The first step in determining cross-sectional area is to measure and calculate the average stream depth. In the table below, record the depth measurements at one-foot intervals along the tape measure you have stretched across the stream. The depth must be measured in **tenths of a foot** (e.g. 1.7 feet equals one foot and seven tenths). **DO NOT MEASURE DEPTH IN INCHES.**

Record Depth at 1-Foot Intervals					
Interval Number	Depth in Feet	Interval Number	Depth in Feet	Interval Number	Depth in Feet
1		11		21	
2		12		22	
3		13		23	
4		14		24	
5		15		25	
6		16		26	
7		17		27	
8		18		28	
9		19		29	
10		20		30	
Sum		Sum		Sum	

The average depth is calculated by dividing the sum of the depth measurements by the number of intervals at which measurments were taken.

☐ (Sum of Depths (Feet)) ÷ ☐ (Number of Intervals) = ☐ (Average Depth (Feet))

The final step in calculating the cross-sectional area is to muliply the average depth (in feet) by the stream width (in feet) at the point where the tape measure is stretched across the stream.

☐ (Average Depths (Feet)) x ☐ (Stream Width (Feet)) = ☐ (Cross Sectional Area (Feet)²)

Step 2: Determine the average velocity for the stream. **For a stream less than ten feet in width,** select three points in the stream approximately equal distances apart for velocity measurements. **For streams greater than ten feet in width,** no fewer than four velocity measurements should be taken at approximately equal distances across the stream. For example, if the stream were eight feet wide, then velocity measurements would be taken at approximately two foot intervals across the stream in order to derive three measurements. If the stream were sixteen feet across, then velocity measurements would be taken at approximately three foot intervals across the stream in order to derive four measurements. This method of measuring the stream velocity will insure that velocity measurements are recorded for the slow and fast portions of the stream.

Once you have determined the number of velocity float trials you need to complete, measure the water's surface velocity in the following manner. Select two points located equal distance upstream and downstream from the tape measure you have stretched across the stream. Determine the distance between these two points and record this value (in feet) in the **Distance Box** on the back of this page. Count the number of seconds it takes a mutually buoyant object (such as a wiffle practice golf ball) to float this distance. Record this time (in seconds) in the table on the back of this page for each float trial you complete

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Velocity Float Trials	
Trial Number	**Time (Seconds)**
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Sum	

Distance Box

Distance Floated (in Feet)

The next step in calculating the surface velocity is to determine the average float time. Average float time is equal to the sum of the float times (in seconds) divided by the number of float trials.

	÷		=	
Sum of Float Times (Seconds)		Number of Trials		Average Float Time (Seconds)

The final step is to divide the distance floated (from the **Distance Box** at top) by the average float time.

	÷		=	
Distance Floated (Feet)		Average Float Time (Seconds)		Average Surface Velocity (Feet per Second)

Water in the stream does not all travel at he same speed. Water near the bottom travels slower than water at the surface because of friction (or drag) on the stream bottom. When calculating stream discharge, the water's velocity for the entire depth (surface to bottom) needs to be determined. Therefore, you must multiply the average **surface** velocity (from above) by a correction factor to make it represent the water velocity of the **entire stream depth.**

Choose the correction factor that best describes the bottom of your stream and multiply it by the average surface velocity to calculate the corrected average stream velocity.

Stream Bottom Type: Rough, loose rocks or coarse gravel: **correction value = 0.8**
Smooth, mud, sand, or hard pan rock: **correction value = 0.9**

	x		=	
Correction Value		Average Surface Velocity (Feet per Second)		Corrected Average Stream Velocity (Feet per Second)

<u>Step 3: Calculate the stream discharge.</u> Multiply the cross-sectional area (Feet)² from **Step 1** by the corrected average stream velocity (Feet/Second) from **Step 2.**

	x		=	
Cross-Sectional Area (Feet)²		Corrected Average Stream Velocity (Feet per Second)		Stream Discharge (Feet)³ per Second or Cubic Feet per Second (CFS)

Comments (mention any changes from your usual readings) _____

_____

Fish Present (Please Mark) **Yes** ❑ or **No**❑

PLEASE KEEP A COPY AND SEND ORIGINAL DATA TO: Stream Team Coordinator
Water Protection Program
Department of Natural Resources
PO Box 176
Jefferson City, MO 65102-0176

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