

LEVEL-ONE SURVEY DATA SHEET (MODIFIED)



(1) DETERMINE THE STREAM-REACH BOUNDARY. (2) NEAR THE LOWER END OF THE REACH (IN THE DEEPEST PORTION OF THE RUN), COLLECT WATER SAMPLES AND ANALYZE USING THE CHEMICAL TESTS YOU HAVE AVAILABLE. YOU MAY USE YOUR COLLECTION CONTAINER TO OBSERVE WATERCOLOR AND CLARITY AND TO DETERMINE WATER ODORS. (3) MEASURE THE WIDTH-DEPTH, VELOCITY AND ESTIMATE THE WATER LEVEL (4) EVALUATE THE HABITAT CONDITIONS. (5) USING A **KICK-NET**, COLLECT A MINIMUM OF THREE BENTHIC MACROINVERTEBRATE SAMPLES FROM THE BEST RIFFLES OR RUNS WITHIN YOUR STREAM REACH. USE THE TALLY SHEET ON PAGE THREE TO RECORD INFORMATION ABOUT YOUR COLLECTIONS. (6) SKETCH YOUR REACH OR SUBMIT PHOTOGRAPHS WITH THE SURVEY AND ADD ANY OTHER COMMENTS THAT YOU FEEL ARE IMPORTANT. NOTE: A WVDNR **SCIENTIFIC COLLECTION PERMIT** IS REQUIRED FOR ALL BENTHIC COLLECTIONS.

Stream name _____ Survey date _____
 Watershed _____ County _____
 Latitude _____ Longitude _____ Directions _____
 Start/end times _____
 Survey completed by _____ Station code _____
 Affiliation _____ E-mail _____
 Mailing address _____ Phone number _____

WATER CHEMISTRY: Use the boxes below to record the results of your water chemistry analysis; attach additional sheets if necessary.

	Result	units		Result	units		Result	units
Temperature (C/F)			Conductivity			Alkalinity		
Dissolved oxygen			Nitrates			Iron		
pH			Turbidity			Fecal/E-coli		
Additional tests (describe and record results) _____								

PHYSICAL CONDITIONS: Use the check boxes below to describe the conditions that closely resemble those of your stream. The extra lines are provided to write in any additional comments. You may see more than one type of condition; if so, be sure to indicate these on your survey (check all that apply). If multiple conditions are observed, always indicate the most dominant condition. Note: If the condition you observe is not listed, describe it in the comment section.

Water clarity		Water color		Water/sediment odor		Surface foam	
				Water	Sediment		
Clear		None		None		None	
Murky		Brown		Fishy		Slight	
Milky		Black		Musky		Moderate	
Muddy		Orange/red		Rotten egg		High	
Other (describe)		Gray/White		Sewage			
		Green		Chemical			
Algae color		Algae abundance		Algae growth habit		Streambed color	
Light green		None		Even coating		Brown	
Dark green		Scattered		Hairy		Black	
Brown		Moderate		Matted		Green	
Other (describe)		Heavy		Floating		White/gray	
						Orange/red	

Physical condition comments: _____

Weather (today and past 48-hours) _____

Circle your estimate

Estimate the % of your reach that is shaded	> 80	80 - 60	60 - 40	< 40
	Excellent	Good	Fair	Poor

Measure **DISCHARGE** in a **RUN** by using a flow meter or other methods such as the **float method** or the **velocity head rod method** (VHR). The more measurements collected the more accurate your discharge will be. However, you should collect a minimum of five measurements. Stretch your tape measure across the run and select a minimum of five positions along the tape to measure discharge. One measurement should be from the deepest part of the channel and the others should be on either side. If you use the float method move 20 feet upstream from the tape and float at least five times back to the tape.

Discharge method used

Float

Velocity Head Rod

Flow meter

Water Level

Low

Normal

High

Dry

Channel width _____ feet

Tape distance (ft)	Depth (ft)	Velocity (ft/sec)	VHR (Rise-inches)	Float (sec)	Discharge (cfs)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
Totals/Averages					

Cross Sectional Area (CSA) _____ ft²

(CSA = Average Depth x Width)

Discharge = CSA x Velocity

= _____ x _____
 = _____ cfs (ft³/sec)

If you use a float record your distance below and the number of seconds, it took to travel the distance in the column indicated. **Float distance** (feet) _____

VHR rises and velocities

Rise (R)	Velocity	Rise (R)	Velocity
¼	1.2	3 ¼	4.2
½	1.6	3 ½	4.3
¾	2.0	3 ¾	4.5
1	2.3	4	4.6
1 ¼	2.6	4 ¼	4.8
1 ½	2.8	4 ½	4.9
1 ¾	3.1	4 ¾	5.0
2	3.3	5	5.2
2 ¼	3.5	5 ¼	5.3
2 ½	3.7	5 ½	5.4
2 ¾	3.8	5 ¾	5.5
3	4.0	6	5.7

PHOTOGRAPH and **SKETCH THE STUDY REACH**: Use the space below to draw your study reach. Indicate the direction of flow, sample locations and important features of the reach. Choose at least two locations from which to take your photos and submit your photos with your survey.

HABITAT ASSESSMENT: Rate the habitat conditions by choosing the best description and score for the reach. Indicate your choice in rating boxes provided. Note: Evaluate embeddedness in riffle areas only. Note: **Pebble counts** are not included in this survey. If you choose to add a pebble count, the coordinator can provide a separate data sheet.

Integrity		Optimal					Suboptimal					Marginal					Poor				
Sediment deposition		Little or no formation of depositional features; < 20% of the reach affected.					Some increase in depositional features; 20-40% of the reach affected					Moderate amounts of depositional features; 40-60% of the reach affected.					Heavy amounts of deposition; > 60% of the reach affected.				
Score		20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Embeddedness		Fine sediments surrounds <10% of the spaces between the gravel, cobble, and boulders.					Fine sediment surrounds 10-30% of the spaces between the gravel, cobble, and boulders.					Fine sediment surrounds 30-60% of the spaces between the gravel, cobble, and boulders.					Fine sediment surrounds > 60% of the spaces between the gravel, cobble, and boulders.				
Score		20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

The next two conditions are evaluated on both the left and right sides.

Bank stability		Bank's stable; no evidence of erosion or bank failure; little or no potential for future problems; < 10% of the reach affected.					Banks moderately stable; infrequent areas of erosion occur, mostly shown by banks healed over or a few bare spots; 10-30 % of the reach affected.					Banks moderately unstable; 30-50% of the reach has some areas of erosion; high potential for erosion during flooding events.					Banks unstable; many have eroded areas (bare soils) along straight sections or bends; obvious bank collapse or failure; > 50% affected.				
	Left	Right																			
Score			10	9	8	7	6	5	4	3	2	1	5	4	3	2	1				
Riparian buffer width		Mainly undisturbed vegetation > 60 ft; no evidence of human impacts such as parking lots, roadbeds, clear-cuts, mowed areas, crops, lawns etc.					Zone of undisturbed vegetation 40-60 ft; some areas of disturbance evident.					Zone of undisturbed vegetation 20-40 ft; disturbed areas common throughout the reach.					Zone of undisturbed vegetation < 20 ft; disturbed areas common throughout the entire reach.				
	Left	Right																			
Score			10	9	8	7	6	5	4	3	2	1	5	4	3	2	1				

Habitat comments: _____

SEDIMENT DEPOSITION may cause the formation of islands, point bars (areas of increased deposition usually at the beginning of a meander that increase in size as the channel is diverted toward the outer bank) or shoals or result in the filling of runs and pools. Usually, deposition is evident in areas that are obstructed by natural or manmade debris and areas where the stream flow decreases, such as bends.

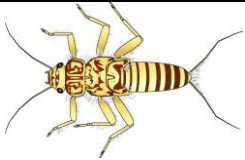
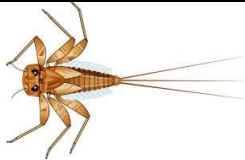


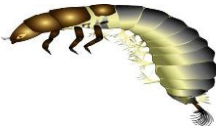

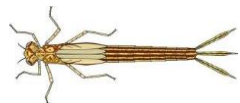
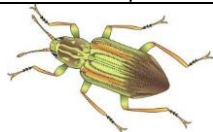


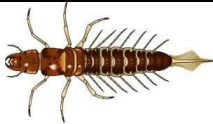






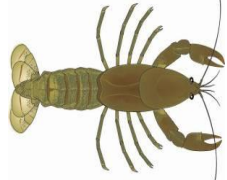




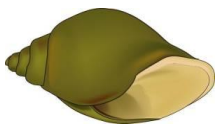

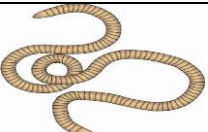


LAND USE: Indicate the land uses that you believe may be having an impact on your stream station. Use the letters **(S)** streamside, **(M)** within ¼ mile and **(W)** somewhere in the watershed, to indicate the approximate location of the disturbance and the numbers **(1)** slight, **(2)** moderate or **(3)** high, to represent the level of disturbance.

Active construction			Pastureland			Single-family residences		
Mountaintop mining			Cropland			Sub-urban developments		
Deep mining			Intensive feedlots			Parking lots, strip-malls etc.		
Abandoned mining			Unpaved Roads			Paved Roads		
Logging			Trash dumps			Bridges		
Oil and gas wells			Landfills			Other (describe)		
Recreation (parks, trails etc.)			Industrial areas					

Pipes? Yes No

Describe the types of pipes observed and indicate if there is any discharge from the pipes. Also describe the colors and odors of the discharge and provide any other land-use comments. _____

BENTHIC MACROINVERTEBRATES: Use the table on page 4 to record information about your collections. Record their abundance using this code: **(A)** > 50, **(C)** 5 – 50 and **(R)** < 5. The # of kind's box indicates groups in which multiple kinds (**families**) are possible. **ALWAYS RECORD THE NUMBER OF KINDS WHEN APPLICABLE.**

 Stoneflies	# of kinds <input type="text"/>	 Mayflies	# of kinds <input type="text"/>	 Caddisflies	Case-builders # of kinds <input type="text"/>
 Dragonflies	# of kinds <input type="text"/>	 Common netspinner		 Caddisflies	Net-spinners Free-living # of kinds <input type="text"/>
 Damselflies	# of kinds <input type="text"/>	 Riffle beetle		 Water penny	
 Hellgrammite		 Alderfly		 Other Beetles/Bugs	Other beetles True bugs # of kinds <input type="text"/>
 Midges		 Black fly		 Crane fly	
 Watersnipe fly		 Other True flies	# of kinds <input type="text"/>	 Crayfish	
 Clams	# of kinds <input type="text"/>	 Mussel		 Scud/Sideswimmer	
 Operculate snails	# of kinds <input type="text"/>	 Non-operculate snails	# of kinds <input type="text"/>	 Aquatic sowbug	
 Aquatic worm		 Leech		 Flatworm	

Other aquatic life observed or collected: _____

Total # of Kinds

THE COORDINATOR WILL DETERMINE YOUR STREAM SCORE AND INTEGRITY BASED ON THE INFORMATION PROVIDED ABOVE. OTHER TYPES OF SINGLE-POLE KICK-NETS ARE AVAILABLE. IF THESE ARE USED THE # AND TYPES OF BENTHIC SAMPLES WILL VARY. CHECK WITH THE COORDINATOR TO DETERMINE THE # AND TYPES (LOCATION) OF SAMPLES YOU SHOULD COLLECT.

Illustration's courtesy of the [Cacapon Institute](#)

Mail a clear copy or the original data sheet to the address at the right. If you submit the original, always keep a copy for your records. If you have questions, contact the [Coordinator](#) or visit: <https://go.wv.gov/sos>.

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