

REACH DOCUMENTATION			Standard Reach Length (wetted width ≤ 10 m) = 150 m Distance between transects = 15 m		Alternate Reach Length (wetted width >10 m) = 250 m Distance between transects = 25 m	
Project Name:			Date:     /     /		Sample Collection Time:	
Stream Name:			Site Name/ Description:			
Site Code:			Crew Members:			
Latitude (actual – decimal degrees): °N			datum: <b>NAD83</b>			
Longitude (actual – decimal degrees): °W			other:		GPS Device:	

AMBIENT WATER QUALITY MEASUREMENTS					* Turbidity, silica, oxygen saturation, and air temp are optional; calibration date required on page 24		Actual Reach Length (m) (see reach length guidelines at top of form)
Water Temp (Deg C)	pH	Alkalinity (mg/L)	Turbidity (ntu)*	Oxygen Sat. (%)*			
Dissolved O <sub>2</sub> (mg/L)	Specific Conduct (uS/cm)	Salinity (ppt)	Silica (mg/L)*	Air Temp (Deg C)*			Explanation:

DISCHARGE MEASUREMENTS								check if discharge measurements not possible <input type="checkbox"/>				
1 <sup>st</sup> measurement = left bank (looking downstream)								(explain in field notes section)				
VELOCITY AREA METHOD (preferred)					cal. date		Transect Width (m):		BUOYANT OBJECT METHOD (use ONLY if velocity area method not possible)			
	Distance from Left Bank (cm)	Depth (cm)	Velocity (ft/sec)		Distance from Left Bank (cm)	Depth (cm)	Velocity (ft/sec)		Float 1	Float 2	Float 3	
1				11					Distance (m)			
2				12					Float Time (sec)			
3				13					Float Reach Cross Section			
4				14					width (m)	Upper Section	Middle Section	
5				15					depth (cm)			
6				16					Width			
7				17					Depth 1			
8				18					Depth 2			
9				19					Depth 3			
10				20					Depth 4			
									Depth 5			

Notable Field Conditions (check one box per topic)					
Evidence of recent rainfall (enough to increase surface runoff)	NO	minimal	>10% flow increase		
Evidence of fires in reach or immediately upstream (<500 m)	NO	< 1 year	< 5 years		
Dominant landuse/landcover in area surrounding reach	Agriculture	Forest	Rangeland		
	Urban/ Industrial	Suburb/Town	Other		
Site is affected by recent scouring event	NO	YES			
Channel Engineered	NO	YES			

ADDITIONAL COBBLE EMBEDDEDNESS MEASURES (carry over from transect forms if needed to attain target count of 25; measure in %)	1	2	3	4	5	6	7	8	9	10	11	12	13	
	14	15	16	17	18	19	20	21	22	23	24	25		

Site Code:		Date: ____ / ____ / ____																			
<b>SLOPE and BEARING FORM (transect based - for Full PHAB only)</b>												AUTOLEVEL CLINOMETER HANDLEVEL OTHER									
Starting Transect	MAIN SEGMENT (record percent of inter-transect distance in each segment if supplemental segments are used)						SUPPLEMENTAL SEGMENT (record percent of inter-transect distance in each segment if supplemental segments are used)														
	Stadia rod measurements	Slope (%) or Elevation Difference		Segment Length (m)	Bearing (0°-359°)	Percent of Total Length (%)	Stadia rod measurements	Slope or Elevation Difference		Segment Length (m)	Bearing (0°-359°)	Percent of Total Length (%)									
		cm <input type="text"/>	% <input type="text"/>					cm <input type="text"/>	% <input type="text"/>												
K																					
J																					
I																					
H																					
G																					
F																					
E																					
D																					
C																					
B																					
A																					
additional calculation area																					
ADDITIONAL HABITAT CHARACTERIZATION							High Gradient <input type="checkbox"/>		Low Gradient <input type="checkbox"/>												
Parameter	Optimal					Suboptimal					Marginal					Poor					
<b>Epifaunal Substrate/ Cover</b>	Greater than 70% of substrate favorable for epifaunal colonization and fish cover (50% for low-gradient streams); mix of submerged logs, undercut banks, cobble or other stable habitat					40-70% mix of stable habitat (30-50% for low-gradient streams); well-suited for full colonization potential					20-40% mix of stable habitat (10-30% in low-gradient streams); substrate frequently disturbed or removed					Less than 20% stable habitat (10% in low-gradient streams); lack of habitat is obvious; substrate unstable or lacking					
<b>Score:</b>	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
<b>Sediment Deposition</b>	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition (<20% in low-gradient streams)					Some new increase in bar formation, mostly from gravel, sand, or fine sediment; 5-30% of the bottom affected (20-50% in low-gradient streams)					Moderate deposition of new gravel, sand, or fine sediment on bars; 30-50% of the bottom affected (50 - 80% in low-gradient streams)					Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently (>80% in low-gradient streams)					
<b>Score:</b>	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
<b>Channel Alteration</b>	Channelization or dredging absent or minimal; stream with normal pattern					Some channelization present, (e.g., bridge abutments); evidence of past channelization (> 20yrs) may be present but recent channelization not present					Channelization may be extensive; embankments or shoring structures present on both banks; 40 to 80% of stream reach disrupted					Banks shored with gabion or cement; Over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely					
<b>Score:</b>	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

Site Code:	Site Name:		Date: ____ / ____ / ____
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):	<b>Transect A</b>

## Transect Substrates

Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	Microalgae Thickness Codes
Left Bank					P A D		P A D	P A D	P A D	<b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

RIPARIAN VEGETATION (facing downstream, 5 m u/s, 5 m d/s, 10 m from wetted width)		INSTREAM HABITAT COMPLEXITY (5 m u/s, 5 m d/s)		DENSIMETER READINGS (0-17) count covered dots	
Vegetation Class	Left Bank	Right Bank	Filamentous Algae	0 1 2 3 4	Center Left
Upper Canopy (>5 m high)			Aquatic Macrophytes/ Emergent Vegetation	0 1 2 3 4	Center Upstream
Trees and saplings >5 m high	0 1 2 3 4	0 1 2 3 4	Boulders	0 1 2 3 4	Center Right
Lower Canopy (0.5 m-5 m high)			Woody Debris >0.3 m	0 1 2 3 4	Center Downstream
All vegetation 0.5 m to 5 m	0 1 2 3 4	0 1 2 3 4	Woody Debris <0.3 m	0 1 2 3 4	Left Bank
Ground Cover (<0.5 m high)			Undercut Banks	0 1 2 3 4	Right Bank
Woody shrubs & saplings <0.5 m	0 1 2 3 4	0 1 2 3 4	Overhang. Vegetation	0 1 2 3 4	
Herbs/ grasses	0 1 2 3 4	0 1 2 3 4	Live Tree Roots	0 1 2 3 4	
Barren, bare soil/ duff	0 1 2 3 4	0 1 2 3 4	Artificial Structures	0 1 2 3 4	

HUMAN INFLUENCE (circle only the closest to wetted channel; assess 5 m u/s, 5 m d/s)	0 = Not Present; B = On Bank; C = Between Bank & 10m from Channel; P = >10m+<50m from Channel; Channel (record Yes or No; if Y for an analyte, do not assess banks)											
	Left Bank				Channel				Right Bank			
Walls/ Rip-rap/ Dams	P	C	B	0	Y	N	0	B	C	P		
Buildings	P	C	B	0	Y	N	0	B	C	P		
Pavement/ Cleared Lot	P	C	B	0			0	B	C	P		
Road/ Railroad	P	C	B	0	Y	N	0	B	C	P		
Pipes (Inlet/ Outlet)	P	C	B	0	Y	N	0	B	C	P		
Landfill/ Trash	P	C	B	0	Y	N	0	B	C	P		
Park/ Lawn	P	C	B	0			0	B	C	P		
Row Crop	P	C	B	0			0	B	C	P		
Pasture/ Range	P	C	B	0			0	B	C	P		
Logging Operations	P	C	B	0			0	B	C	P		
Mining Activity	P	C	B	0	Y	N	0	B	C	P		
Vegetation Management	P	C	B	0			0	B	C	P		
Bridges/ Abutments	P	C	B	0	Y	N	0	B	C	P		
Orchards/ Vineyards	P	C	B	0			0	B	C	P		

BANK STABILITY (assess point of transect between wetted width and bankfull )			
Left Bank	eroded	vulnerable	stable
Right Bank	eroded	vulnerable	stable

**TAKE PHOTOGRAPHS**  
(check box if taken & record photo code)

Downstream (optional)

☐

Upstream (required)

☐

Inter-Transect: AB						Wetted Width (m):				
Inter-Transect Substrates										
Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b> <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

FLOW HABITATS	
(% between transects, total=100%)	
Channel Type	%
Cascade/ Falls	
Rapid	
Riffle	
Run	
Glide	
Pool	
Dry	

Site Code:	Site Name:		Date: ____ / ____ / ____
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):	<b>Transect B</b>

**Transect Substrates**

Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b> <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

RIPARIAN VEGETATION (facing downstream, 5 m u/s, 5 m d/s, 10 m from wetted width)		0 = Absent (0%)                      3 = Heavy (40-75%) 1 = Sparse (<10%)                4 = Very Heavy (>75%) 2 = Moderate (10-40%)									
Vegetation Class		Left Bank			Right Bank						
Upper Canopy (>5 m high)											
Trees and saplings >5 m high		0	1	2	3	4	0	1	2	3	4
Lower Canopy (0.5 m-5 m high)											
All vegetation 0.5 m to 5 m		0	1	2	3	4	0	1	2	3	4
Ground Cover (<0.5 m high)											
Woody shrubs & saplings <0.5 m		0	1	2	3	4	0	1	2	3	4
Herbs/ grasses		0	1	2	3	4	0	1	2	3	4
Barren, bare soil/ duff		0	1	2	3	4	0	1	2	3	4

INSTREAM HABITAT COMPLEXITY (5 m u/s, 5 m d/s)		0 = Absent (0%) 1 = Sparse (<10%) 2 = Moderate (10-40%) 3 = Heavy (40-75%) 4 = Very Heavy (>75%)				
Filamentous Algae		0	1	2	3	4
Aquatic Macrophytes/ Emergent Vegetation		0	1	2	3	4
Boulders		0	1	2	3	4
Woody Debris >0.3 m		0	1	2	3	4
Woody Debris <0.3 m		0	1	2	3	4
Undercut Banks		0	1	2	3	4
Overhang. Vegetation		0	1	2	3	4
Live Tree Roots		0	1	2	3	4
Artificial Structures		0	1	2	3	4

DENSIOMETER READINGS (0-17) <i>count covered dots</i>			
Center Left			
Center Upstream			
Center Right			
Center Downstream			
Left Bank			
Right Bank			

Inter-Transect: BC						Wetted Width (m):				
Inter-Transect Substrates										
Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b> <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

FLOW HABITATS	
( % between transects, total=100%)	
Channel Type	%
Cascade/ Falls	
Rapid	
Riffle	
Run	
Glide	
Pool	
Dry	

Site Code:	Site Name:		Date: ____ / ____ / ____
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):	<b>Transect C</b>

**Transect Substrates**

Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b> <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

RIPARIAN VEGETATION (facing downstream, 5 m u/s, 5 m d/s, 10 m from wetted width)		0 = Absent (0%) 1 = Sparse (<10%) 2 = Moderate (10-40%) 3 = Heavy (40-75%) 4 = Very Heavy (>75%)			
Vegetation Class	Left Bank		Right Bank		
Upper Canopy (>5 m high)					
Trees and saplings >5 m high	0	1	2	3	4
Lower Canopy (0.5 m-5 m high)					
All vegetation 0.5 m to 5 m	0	1	2	3	4
Ground Cover (<0.5 m high)					
Woody shrubs & saplings <0.5 m	0	1	2	3	4
Herbs/ grasses	0	1	2	3	4
Barren, bare soil/ duff	0	1	2	3	4

INSTREAM HABITAT COMPLEXITY (5 m u/s, 5 m d/s)		0 = Absent (0%) 1 = Sparse (<10%) 2 = Moderate (10-40%) 3 = Heavy (40-75%) 4 = Very Heavy (>75%)				
Filamentous Algae	0 1 2 3 4					
Aquatic Macrophytes/ Emergent Vegetation	0 1 2 3 4					
Boulders	0 1 2 3 4					
Woody Debris >0.3 m	0 1 2 3 4					
Woody Debris <0.3 m	0 1 2 3 4					
Undercut Banks	0 1 2 3 4					
Overhang. Vegetation	0 1 2 3 4					
Live Tree Roots	0 1 2 3 4					
Artificial Structures	0 1 2 3 4					

DENSIOMETER READINGS (0-17) <i>count covered dots</i>	
Center Left	
Center Upstream	
Center Right	
Center Downstream	
Left Bank	
Right Bank	

Inter-Transect: CD						Wetted Width (m):				
Inter-Transect Substrates										
Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b> <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

FLOW HABITATS	
(% between transects, total=100%)	
Channel Type	%
Cascade/ Falls	
Rapid	
Riffle	
Run	
Glide	
Pool	
Dry	



Site Code:	Site Name:		Date: ____ / ____ / ____
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):	<b>Transect D</b>

**Transect Substrates**

Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b>  <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

<b>RIPARIAN VEGETATION</b> (facing downstream, 5 m u/s, 5 m d/s, 10 m from wetted width)		0 = Absent (0%)      3 = Heavy (40-75%) 1 = Sparse (<10%)    4 = Very Heavy (>75%) 2 = Moderate (10-40%)		<b>INSTREAM HABITAT COMPLEXITY</b> (5 m u/s, 5 m d/s)		0 = Absent (0%) 1 = Sparse (<10%) 2 = Moderate (10-40%) 3 = Heavy (40-75%) 4 = Very Heavy (>75%)	<b>DENSIOMETER READINGS (0-17)</b> <i>count covered dots</i>	
<b>Vegetation Class</b>	<b>Left Bank</b>	<b>Right Bank</b>						
<b>Upper Canopy (&gt;5 m high)</b>								
Trees and saplings >5 m high	0 1 2 3 4	0 1 2 3 4			Filamentous Algae	0 1 2 3 4		Center Left
<b>Lower Canopy (0.5 m-5 m high)</b>								
All vegetation 0.5 m to 5 m	0 1 2 3 4	0 1 2 3 4			Aquatic Macrophytes/ Emergent Vegetation	0 1 2 3 4		Center Upstream
<b>Ground Cover (&lt;0.5 m high)</b>								
Woody shrubs & saplings <0.5 m	0 1 2 3 4	0 1 2 3 4			Boulders	0 1 2 3 4		Center Right
Herbs/ grasses	0 1 2 3 4	0 1 2 3 4			Woody Debris >0.3 m	0 1 2 3 4		Center Downstream
Barren, bare soil/ duff	0 1 2 3 4	0 1 2 3 4			Woody Debris <0.3 m	0 1 2 3 4		
					Undercut Banks	0 1 2 3 4		Left Bank
					Overhang. Vegetation	0 1 2 3 4		Right Bank
					Live Tree Roots	0 1 2 3 4		
					Artificial Structures	0 1 2 3 4		

<b>HUMAN INFLUENCE</b> (circle only the closest to wetted channel; assess 5 m u/s, 5 m d/s)	0 = Not Present; B = On Bank; C = Between Bank & 10m from Channel; P = >10m+<50m from Channel; Channel (record Yes or No; if Y for an analyte, do not assess banks)						
	<b>Left Bank</b>	<b>Channel</b>	<b>Right Bank</b>				
Walls/ Rip-rap/ Dams	P C B 0	Y N	0 B C P				
Buildings	P C B 0	Y N	0 B C P				
Pavement/ Cleared Lot	P C B 0		0 B C P				
Road/ Railroad	P C B 0	Y N	0 B C P				
Pipes (Inlet/ Outlet)	P C B 0	Y N	0 B C P				
Landfill/ Trash	P C B 0	Y N	0 B C P				
Park/ Lawn	P C B 0		0 B C P				
Row Crop	P C B 0		0 B C P				
Pasture/ Range	P C B 0		0 B C P				
Logging Operations	P C B 0		0 B C P				
Mining Activity	P C B 0	Y N	0 B C P				
Vegetation Management	P C B 0		0 B C P				
Bridges/ Abutments	P C B 0	Y N	0 B C P				
Orchards/ Vineyards	P C B 0		0 B C P				

<b>BANK STABILITY</b> (assess point of transect between wetted width and bankfull )			
<b>Left Bank</b>	eroded	vulnerable	stable
<b>Right Bank</b>	eroded	vulnerable	stable

Inter-Transect: DE						Wetted Width (m):				
Inter-Transect Substrates										
Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b> <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

FLOW HABITATS	
(% between transects, total=100%)	
Channel Type	%
Cascade/ Falls	
Rapid	
Riffle	
Run	
Glide	
Pool	
Dry	

Site Code:	Site Name:		Date: ____ / ____ / ____
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):	<b>Transect E</b>

## Transect Substrates

Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b>  <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

<b>RIPARIAN VEGETATION</b> (facing downstream, 5 m u/s, 5 m d/s, 10 m from wetted width)	0 = Absent (0%)      3 = Heavy (40-75%) 1 = Sparse (<10%)      4 = Very Heavy (>75%) 2 = Moderate (10-40%)		
	<b>Vegetation Class</b>	<b>Left Bank</b>	<b>Right Bank</b>
	<b>Upper Canopy (&gt;5 m high)</b>		
	Trees and saplings >5 m high	0 1 2 3 4	0 1 2 3 4
	<b>Lower Canopy (0.5 m-5 m high)</b>		
	All vegetation 0.5 m to 5 m	0 1 2 3 4	0 1 2 3 4
	<b>Ground Cover (&lt;0.5 m high)</b>		
	Woody shrubs & saplings <0.5 m	0 1 2 3 4	0 1 2 3 4
	Herbs/ grasses	0 1 2 3 4	0 1 2 3 4
	Barren, bare soil/ duff	0 1 2 3 4	0 1 2 3 4

<b>INSTREAM HABITAT COMPLEXITY</b> (5 m u/s, 5 m d/s)	0 = Absent (0%) 1 = Sparse (<10%) 2 = Moderate (10-40%) 3 = Heavy (40-75%) 4 = Very Heavy (>75%)	
	Filamentous Algae	0 1 2 3 4
	Aquatic Macrophytes/ Emergent Vegetation	0 1 2 3 4
	Boulders	0 1 2 3 4
	Woody Debris >0.3 m	0 1 2 3 4
	Woody Debris <0.3 m	0 1 2 3 4
	Undercut Banks	0 1 2 3 4
	Overhang. Vegetation	0 1 2 3 4
	Live Tree Roots	0 1 2 3 4
	Artificial Structures	0 1 2 3 4

<b>DENSIOMETER READINGS (0-17)</b> <i>count covered dots</i>	
Center Left	
Center Upstream	
Center Right	
Center Downstream	
Left Bank	
Right Bank	

<b>HUMAN INFLUENCE</b> (circle only the closest to wetted channel; assess 5 m u/s, 5 m d/s)	0 = Not Present; B = On Bank; C = Between Bank & 10m from Channel; P = >10m+<50m from Channel; Channel (record Yes or No; if Y for an analyte, do not assess banks)		
	<b>Left Bank</b>	<b>Channel</b>	<b>Right Bank</b>
Walls/ Rip-rap/ Dams	P C B 0	Y N	0 B C P
Buildings	P C B 0	Y N	0 B C P
Pavement/ Cleared Lot	P C B 0		0 B C P
Road/ Railroad	P C B 0	Y N	0 B C P
Pipes (Inlet/ Outlet)	P C B 0	Y N	0 B C P
Landfill/ Trash	P C B 0	Y N	0 B C P
Park/ Lawn	P C B 0		0 B C P
Row Crop	P C B 0		0 B C P
Pasture/ Range	P C B 0		0 B C P
Logging Operations	P C B 0		0 B C P
Mining Activity	P C B 0	Y N	0 B C P
Vegetation Management	P C B 0		0 B C P
Bridges/ Abutments	P C B 0	Y N	0 B C P
Orchards/ Vineyards	P C B 0		0 B C P

<b>BANK STABILITY</b> (assess point of transect between wetted width and bankfull )			
<b>Left Bank</b>	eroded	vulnerable	stable
<b>Right Bank</b>	eroded	vulnerable	stable

Inter-Transect: EF						Wetted Width (m):				
Inter-Transect Substrates										
Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b> <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

FLOW HABITATS	
( % between transects, total=100%)	
Channel Type	%
Cascade/ Falls	
Rapid	
Riffle	
Run	
Glide	
Pool	
Dry	

Site Code:	Site Name:		Date: ____ / ____ / ____
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):	<b>Transect F</b>

Transect Substrates									
Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes
Left Bank					P A D		P A D	P A D	P A D
Left Center					P A D		P A D	P A D	P A D
Center					P A D		P A D	P A D	P A D
Right Center					P A D		P A D	P A D	P A D
Right Bank					P A D		P A D	P A D	P A D
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)									

**Microalgae Thickness Codes**  
**0** = No microalgae present, Feels rough, not slimy;  
**1** = Present but not visible, Feels slimy;  
**2** = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail.  
**3** = 1-5mm;  
**4** = 5-20mm;  
**5** = >20mm;  
**UD** = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code).  
**D** = Dry, not assessed

RIPARIAN VEGETATION (facing downstream, 5 m u/s, 5 m d/s, 10 m from wetted width)		INSTREAM HABITAT COMPLEXITY (5 m u/s, 5 m d/s)		DENSIOMETER READINGS (0-17) count covered dots	
Vegetation Class	Left Bank	Right Bank	Filamentous Algae	0 1 2 3 4	Center Left
Upper Canopy (>5 m high)			Aquatic Macrophytes/ Emergent Vegetation	0 1 2 3 4	Center Upstream
Trees and saplings >5 m high	0 1 2 3 4	0 1 2 3 4	Boulders	0 1 2 3 4	Center Right
Lower Canopy (0.5 m-5 m high)			Woody Debris >0.3 m	0 1 2 3 4	Center Downstream
All vegetation 0.5 m to 5 m	0 1 2 3 4	0 1 2 3 4	Woody Debris <0.3 m	0 1 2 3 4	
Ground Cover (<0.5 m high)			Undercut Banks	0 1 2 3 4	Left Bank
Woody shrubs & saplings <0.5 m	0 1 2 3 4	0 1 2 3 4	Overhang. Vegetation	0 1 2 3 4	Right Bank
Herbs/ grasses	0 1 2 3 4	0 1 2 3 4	Live Tree Roots	0 1 2 3 4	
Barren, bare soil/ duff	0 1 2 3 4	0 1 2 3 4	Artificial Structures	0 1 2 3 4	

HUMAN INFLUENCE (circle only the closest to wetted channel; assess 5 m u/s, 5 m d/s)	0 = Not Present; B = On Bank; C = Between Bank & 10m from Channel; P = >10m+<50m from Channel; Channel (record Yes or No; if Y for an analyte, do not assess banks)											
	Left Bank				Channel				Right Bank			
Walls/ Rip-rap/ Dams	P	C	B	0	Y	N	0	B	C	P		
Buildings	P	C	B	0	Y	N	0	B	C	P		
Pavement/ Cleared Lot	P	C	B	0			0	B	C	P		
Road/ Railroad	P	C	B	0	Y	N	0	B	C	P		
Pipes (Inlet/ Outlet)	P	C	B	0	Y	N	0	B	C	P		
Landfill/ Trash	P	C	B	0	Y	N	0	B	C	P		
Park/ Lawn	P	C	B	0			0	B	C	P		
Row Crop	P	C	B	0			0	B	C	P		
Pasture/ Range	P	C	B	0			0	B	C	P		
Logging Operations	P	C	B	0			0	B	C	P		
Mining Activity	P	C	B	0	Y	N	0	B	C	P		
Vegetation Management	P	C	B	0			0	B	C	P		
Bridges/ Abutments	P	C	B	0	Y	N	0	B	C	P		
Orchards/ Vineyards	P	C	B	0			0	B	C	P		

BANK STABILITY (assess point of transect between wetted width and bankfull )			
Left Bank	eroded	vulnerable	stable
Right Bank	eroded	vulnerable	stable

**TAKE PHOTOGRAPHS**  
*(check box if taken & record photo code)*

Downstream (required) ☐

Upstream (required) ☐

Inter-Transect: FG						Wetted Width (m):				
Inter-Transect Substrates										
Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b> <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

FLOW HABITATS	
(% between transects, total=100%)	
Channel Type	%
Cascade/ Falls	
Rapid	
Riffle	
Run	
Glide	
Pool	
Dry	

Site Code:	Site Name:		Date: ____ / ____ / ____
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):	<b>Transect G</b>

**Transect Substrates**

Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b> <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

<b>RIPARIAN VEGETATION</b> (facing downstream, 5 m u/s, 5 m d/s, 10 m from wetted width)			0 = Absent (0%)      3 = Heavy (40-75%) 1 = Sparse (<10%)    4 = Very Heavy (>75%) 2 = Moderate (10-40%)				<b>INSTREAM HABITAT COMPLEXITY</b> (5 m u/s, 5 m d/s)				0 = Absent (0%) 1 = Sparse (<10%) 2 = Moderate (10-40%) 3 = Heavy (40-75%) 4 = Very Heavy (>75%)				<b>DENSIOMETER READINGS (0-17)</b> <i>count covered dots</i>	
Vegetation Class			Left Bank				Right Bank									
Upper Canopy (>5 m high)																
Trees and saplings >5 m high	0	1	2	3	4	0	1	2	3	4	Filamentous Algae	0	1	2	3	4
Lower Canopy (0.5 m-5 m high)															Center Left	
All vegetation 0.5 m to 5 m	0	1	2	3	4	0	1	2	3	4	Aquatic Macrophytes/ Emergent Vegetation	0	1	2	3	4
Ground Cover (<0.5 m high)															Center Upstream	
Woody shrubs & saplings <0.5 m	0	1	2	3	4	0	1	2	3	4	Boulders	0	1	2	3	4
Herbs/ grasses	0	1	2	3	4	0	1	2	3	4	Woody Debris >0.3 m	0	1	2	3	4
Barren, bare soil/ duff	0	1	2	3	4	0	1	2	3	4	Woody Debris <0.3 m	0	1	2	3	4
															Center Right	
															Center Downstream	
															Left Bank	
															Right Bank	

Inter-Transect: GH						Wetted Width (m):				
Inter-Transect Substrates										
Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b> <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

FLOW HABITATS	
(% between transects, total=100%)	
Channel Type	%
Cascade/ Falls	
Rapid	
Riffle	
Run	
Glide	
Pool	
Dry	



Site Code:	Site Name:		Date: ____ / ____ / ____
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):	<b>Transect H</b>

**Transect Substrates**

Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b>  0 = No microalgae present, Feels rough, not slimy; 1 = Present but not visible, Feels slimy; 2 = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. 3 = 1-5mm; 4 = 5-20mm; 5 = >20mm; UD = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). D = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

RIPARIAN VEGETATION (facing downstream, 5 m u/s, 5 m d/s, 10 m from wetted width)		0 = Absent (0%) 1 = Sparse (<10%) 2 = Moderate (10-40%) 3 = Heavy (40-75%) 4 = Very Heavy (>75%)		INSTREAM HABITAT COMPLEXITY (5 m u/s, 5 m d/s)		0 = Absent (0%) 1 = Sparse (<10%) 2 = Moderate (10-40%) 3 = Heavy (40-75%) 4 = Very Heavy (>75%)		DENSIOMETER READINGS (0-17) <i>count covered dots</i>					
Vegetation Class		Left Bank		Right Bank		Filamentous Algae		Center Left					
Upper Canopy (>5 m high)						Aquatic Macrophytes/ Emergent Vegetation		Center Upstream					
Trees and saplings >5 m high		0	1	2	3	4	0	1	2	3	4	Center Right	
Lower Canopy (0.5 m-5 m high)						Boulders		Center Downstream					
All vegetation 0.5 m to 5 m		0	1	2	3	4	0	1	2	3	4		
Ground Cover (<0.5 m high)						Woody Debris >0.3 m							
Woody shrubs & saplings <0.5 m		0	1	2	3	4	0	1	2	3	4		
Herbs/ grasses		0	1	2	3	4	0	1	2	3	4	Left Bank	
Barren, bare soil/ duff		0	1	2	3	4	0	1	2	3	4	Right Bank	
						Undercut Banks							
						Overhang. Vegetation							
						Live Tree Roots							
						Artificial Structures							

<b>HUMAN INFLUENCE</b> (circle only the closest to wetted channel; assess 5 m u/s, 5 m d/s)	0 = Not Present; B = On Bank; C = Between Bank & 10m from Channel; P = >10m+<50m from Channel; Channel (record Yes or No; if Y for an analyte, do not assess banks)											
	Left Bank				Channel		Right Bank					
Walls/ Rip-rap/ Dams	P	C	B	0	Y	N	0	B	C	P		
Buildings	P	C	B	0	Y	N	0	B	C	P		
Pavement/ Cleared Lot	P	C	B	0			0	B	C	P		
Road/ Railroad	P	C	B	0	Y	N	0	B	C	P		
Pipes (Inlet/ Outlet)	P	C	B	0	Y	N	0	B	C	P		
Landfill/ Trash	P	C	B	0	Y	N	0	B	C	P		
Park/ Lawn	P	C	B	0			0	B	C	P		
Row Crop	P	C	B	0			0	B	C	P		
Pasture/ Range	P	C	B	0			0	B	C	P		
Logging Operations	P	C	B	0			0	B	C	P		
Mining Activity	P	C	B	0	Y	N	0	B	C	P		
Vegetation Management	P	C	B	0			0	B	C	P		
Bridges/ Abutments	P	C	B	0	Y	N	0	B	C	P		
Orchards/ Vineyards	P	C	B	0			0	B	C	P		

<b>BANK STABILITY</b> (assess point of transect between wetted width and bankfull )			
Left Bank	eroded	vulnerable	stable
Right Bank	eroded	vulnerable	stable

Inter-Transect: HI						Wetted Width (m):				
Inter-Transect Substrates										
Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b> <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

FLOW HABITATS	
(% between transects, total=100%)	
Channel Type	%
Cascade/ Falls	
Rapid	
Riffle	
Run	
Glide	
Pool	
Dry	

Site Code:	Site Name:		Date: ____ / ____ / ____
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):	<b>Transect I</b>

Transect Substrates										
Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b> <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

<b>RIPARIAN VEGETATION</b> (facing downstream, 5 m u/s, 5 m d/s, 10 m from wetted width)			<b>INSTREAM HABITAT COMPLEXITY</b> (5 m u/s, 5 m d/s)		<b>DENSIOMETER READINGS (0-17)</b> <i>count covered dots</i>	
0 = Absent (0%) 1 = Sparse (<10%) 2 = Moderate (10-40%) 3 = Heavy (40-75%) 4 = Very Heavy (>75%)						
<b>Vegetation Class</b>	<b>Left Bank</b>	<b>Right Bank</b>				
<b>Upper Canopy (&gt;5 m high)</b>						
Trees and saplings >5 m high	0 1 2 3 4	0 1 2 3 4	Filamentous Algae	0 1 2 3 4	Center Left	
			Aquatic Macrophytes/ Emergent Vegetation	0 1 2 3 4	Center Upstream	
			Boulders	0 1 2 3 4	Center Right	
			Woody Debris >0.3 m	0 1 2 3 4	Center Downstream	
			Woody Debris <0.3 m	0 1 2 3 4		
			Undercut Banks	0 1 2 3 4	Left Bank	
			Overhang. Vegetation	0 1 2 3 4	Right Bank	
			Live Tree Roots	0 1 2 3 4		
			Artificial Structures	0 1 2 3 4		
<b>Lower Canopy (0.5 m-5 m high)</b>						
All vegetation 0.5 m to 5 m	0 1 2 3 4	0 1 2 3 4				
<b>Ground Cover (&lt;0.5 m high)</b>						
Woody shrubs & saplings <0.5 m	0 1 2 3 4	0 1 2 3 4				
Herbs/ grasses	0 1 2 3 4	0 1 2 3 4				
Barren, bare soil/ duff	0 1 2 3 4	0 1 2 3 4				

<b>HUMAN INFLUENCE</b> (circle only the closest to wetted channel; assess 5 m u/s, 5 m d/s)	0 = Not Present; B = On Bank; C = Between Bank & 10m from Channel; P = >10m+<50m from Channel; Channel (record Yes or No; if Y for an analyte, do not assess banks)											
	Left Bank				Channel				Right Bank			
Walls/ Rip-rap/ Dams	P	C	B	0	Y	N	0	B	C	P		
Buildings	P	C	B	0	Y	N	0	B	C	P		
Pavement/ Cleared Lot	P	C	B	0			0	B	C	P		
Road/ Railroad	P	C	B	0	Y	N	0	B	C	P		
Pipes (Inlet/ Outlet)	P	C	B	0	Y	N	0	B	C	P		
Landfill/ Trash	P	C	B	0	Y	N	0	B	C	P		
Park/ Lawn	P	C	B	0			0	B	C	P		
Row Crop	P	C	B	0			0	B	C	P		
Pasture/ Range	P	C	B	0			0	B	C	P		
Logging Operations	P	C	B	0			0	B	C	P		
Mining Activity	P	C	B	0	Y	N	0	B	C	P		
Vegetation Management	P	C	B	0			0	B	C	P		
Bridges/ Abutments	P	C	B	0	Y	N	0	B	C	P		
Orchards/ Vineyards	P	C	B	0			0	B	C	P		

<b>BANK STABILITY</b> (assess point of transect between wetted width and bankfull )			
Left Bank	eroded	vulnerable	stable
Right Bank	eroded	vulnerable	stable

Inter-Transect: IJ						Wetted Width (m):				
Inter-Transect Substrates										
Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b> <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

FLOW HABITATS	
(% between transects, total=100%)	
Channel Type	%
Cascade/ Falls	
Rapid	
Riffle	
Run	
Glide	
Pool	
Dry	

Site Code:	Site Name:		Date: ____ / ____ / ____
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):	<b>Transect J</b>

## Transect Substrates

Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b>  <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

<b>RIPARIAN VEGETATION</b> (facing downstream, 5 m u/s, 5 m d/s, 10 m from wetted width)		0 = Absent (0%)      3 = Heavy (40-75%) 1 = Sparse (<10%)      4 = Very Heavy (>75%) 2 = Moderate (10-40%)	
<b>Vegetation Class</b>	<b>Left Bank</b>	<b>Right Bank</b>	
<b>Upper Canopy (&gt;5 m high)</b>			
Trees and saplings >5 m high	0 1 2 3 4	0 1 2 3 4	
<b>Lower Canopy (0.5 m-5 m high)</b>			
All vegetation 0.5 m to 5 m	0 1 2 3 4	0 1 2 3 4	
<b>Ground Cover (&lt;0.5 m high)</b>			
Woody shrubs & saplings <0.5 m	0 1 2 3 4	0 1 2 3 4	
Herbs/ grasses	0 1 2 3 4	0 1 2 3 4	
Barren, bare soil/ duff	0 1 2 3 4	0 1 2 3 4	

<b>INSTREAM HABITAT COMPLEXITY</b> (5 m u/s, 5 m d/s)	0 = Absent (0%) 1 = Sparse (<10%) 2 = Moderate (10-40%) 3 = Heavy (40-75%) 4 = Very Heavy (>75%)
Filamentous Algae	0 1 2 3 4
Aquatic Macrophytes/ Emergent Vegetation	0 1 2 3 4
Boulders	0 1 2 3 4
Woody Debris >0.3 m	0 1 2 3 4
Woody Debris <0.3 m	0 1 2 3 4
Undercut Banks	0 1 2 3 4
Overhang. Vegetation	0 1 2 3 4
Live Tree Roots	0 1 2 3 4
Artificial Structures	0 1 2 3 4

<b>DENSIOMETER READINGS (0-17)</b> count covered dots	
Center Left	
Center Upstream	
Center Right	
Center Downstream	
Left Bank	
Right Bank	

<b>HUMAN INFLUENCE</b> (circle only the closest to wetted channel; assess 5 m u/s, 5 m d/s)	0 = Not Present; B = On Bank; C = Between Bank & 10m from Channel; P = >10m+<50m from Channel; Channel (record Yes or No; if Y for an analyte, do not assess banks)		
	<b>Left Bank</b>	<b>Channel</b>	<b>Right Bank</b>
Walls/ Rip-rap/ Dams	P C B 0	Y N	0 B C P
Buildings	P C B 0	Y N	0 B C P
Pavement/ Cleared Lot	P C B 0		0 B C P
Road/ Railroad	P C B 0	Y N	0 B C P
Pipes (Inlet/ Outlet)	P C B 0	Y N	0 B C P
Landfill/ Trash	P C B 0	Y N	0 B C P
Park/ Lawn	P C B 0		0 B C P
Row Crop	P C B 0		0 B C P
Pasture/ Range	P C B 0		0 B C P
Logging Operations	P C B 0		0 B C P
Mining Activity	P C B 0	Y N	0 B C P
Vegetation Management	P C B 0		0 B C P
Bridges/ Abutments	P C B 0	Y N	0 B C P
Orchards/ Vineyards	P C B 0		0 B C P

<b>BANK STABILITY</b> (assess point of transect between wetted width and bankfull )			
<b>Left Bank</b>	eroded	vulnerable	stable
<b>Right Bank</b>	eroded	vulnerable	stable

Inter-Transect: JK						Wetted Width (m):				
Inter-Transect Substrates										
Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b> <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>UD</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

FLOW HABITATS	
(% between transects, total=100%)	
Channel Type	%
Cascade/ Falls	
Rapid	
Riffle	
Run	
Glide	
Pool	
Dry	

Site Code:	Site Name:		Date: ____ / ____ / ____
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):	<b>Transect K</b>

Transect Substrates										
Position	Dist from LB (m)	Depth (cm)	mm/size class	% Cobble Embed.	CPOM	Microalgae Thickness Code	Macroalgae Attached	Macroalgae Unattached	Macrophytes	<b>Microalgae Thickness Codes</b> <b>0</b> = No microalgae present, Feels rough, not slimy; <b>1</b> = Present but not visible, Feels slimy; <b>2</b> = Present and visible but <1mm; Rubbing fingers on surface produces a brownish tint on them, scraping leaves visible trail. <b>3</b> = 1-5mm; <b>4</b> = 5-20mm; <b>5</b> = >20mm; <b>U</b> = Cannot determine if microalgae present, substrate too small or covered with silt (formerly Z code). <b>D</b> = Dry, not assessed
Left Bank					P A D		P A D	P A D	P A D	
Left Center					P A D		P A D	P A D	P A D	
Center					P A D		P A D	P A D	P A D	
Right Center					P A D		P A D	P A D	P A D	
Right Bank					P A D		P A D	P A D	P A D	
Note: Substrate sizes can be recorded either as direct measures of the median axis of each particle or one of the size class categories listed on the supplemental page (direct measurements preferred)										

RIPARIAN VEGETATION (facing downstream, 5 m u/s, 5 m d/s, 10 m from wetted width)		INSTREAM HABITAT COMPLEXITY (5 m u/s, 5 m d/s)		DENSIOMETER READINGS (0-17) count covered dots	
Vegetation Class	Left Bank	Right Bank	Filamentous Algae	0 1 2 3 4	Center Left
Upper Canopy (>5 m high)			Aquatic Macrophytes/ Emergent Vegetation	0 1 2 3 4	Center Upstream
Trees and saplings >5 m high	0 1 2 3 4	0 1 2 3 4	Boulders	0 1 2 3 4	Center Right
Lower Canopy (0.5 m-5 m high)			Woody Debris >0.3 m	0 1 2 3 4	Center Downstream
All vegetation 0.5 m to 5 m	0 1 2 3 4	0 1 2 3 4	Woody Debris <0.3 m	0 1 2 3 4	
Ground Cover (<0.5 m high)			Undercut Banks	0 1 2 3 4	Left Bank
Woody shrubs & saplings <0.5 m	0 1 2 3 4	0 1 2 3 4	Overhang. Vegetation	0 1 2 3 4	Right Bank
Herbs/ grasses	0 1 2 3 4	0 1 2 3 4	Live Tree Roots	0 1 2 3 4	
Barren, bare soil/ duff	0 1 2 3 4	0 1 2 3 4	Artificial Structures	0 1 2 3 4	

HUMAN INFLUENCE (circle only the closest to wetted channel; assess 5 m u/s, 5 m d/s)	0 = Not Present; B = On Bank; C = Between Bank & 10m from Channel; P = >10m+<50m from Channel; Channel (record Yes or No; if Y for an analyte, do not assess banks)									
	Left Bank		Channel	Right Bank						
Walls/ Rip-rap/ Dams	P	C	B	0	Y	N	0	B	C	P
Buildings	P	C	B	0	Y	N	0	B	C	P
Pavement/ Cleared Lot	P	C	B	0			0	B	C	P
Road/ Railroad	P	C	B	0	Y	N	0	B	C	P
Pipes (Inlet/ Outlet)	P	C	B	0	Y	N	0	B	C	P
Landfill/ Trash	P	C	B	0	Y	N	0	B	C	P
Park/ Lawn	P	C	B	0			0	B	C	P
Row Crop	P	C	B	0			0	B	C	P
Pasture/ Range	P	C	B	0			0	B	C	P
Logging Operations	P	C	B	0			0	B	C	P
Mining Activity	P	C	B	0	Y	N	0	B	C	P
Vegetation Management	P	C	B	0			0	B	C	P
Bridges/ Abutments	P	C	B	0	Y	N	0	B	C	P
Orchards/ Vineyards	P	C	B	0			0	B	C	P

BANK STABILITY (assess point of transect between wetted width and bankfull )			
Left Bank	eroded	vulnerable	stable
Right Bank	eroded	vulnerable	stable

TAKE PHOTOGRAPHS (check box if taken & record photo code)	
Downstream ( required )	<input type="checkbox"/>
Upstream (optional)	<input type="checkbox"/>

Site Code:			Date: ____ / ____ / ____		<b>Analyte</b>	<b>Equipment &amp; Calibration Date</b>
<b>BENTHIC INVERTEBRATE SAMPLES</b>					pH	
					Cal date: ____ / ____ / ____	
<b>Collection Method</b> (indicate standard or margin-center-margin)			<b>Replicate</b>	<b># Jars</b>	Wat temp	
Cal date: ____ / ____ / ____						
RWB (standard)	RWB (MCM)	TRC	1		dissolved oxygen	
Cal date: ____ / ____ / ____						
RWB (standard)	RWB (MCM)	TRC	2		oxygen sat	
Cal date: ____ / ____ / ____						
RWB (standard)	RWB (MCM)	TRC			specific cond	
Cal date: ____ / ____ / ____						
RWB (standard)	RWB (MCM)	TRC			Salinity	
Cal date: ____ / ____ / ____						
<b>Field Notes/ Comments:</b> Was macroalgae (e.g., filamentous algae) collected in the composite algae sample? Yes / No If YES, how many of the 11 transect samples contained macroalgae? _____ If YES, what was the original size of the macroalgae cylinder roll before sectioning into ¼ and ¾ pieces? _____ mm length x _____ mm diameter					Alkalinity	
					Cal date: ____ / ____ / ____	
					Turbidity	
					Cal date: ____ / ____ / ____	
					Silica	
					Cal date: ____ / ____ / ____	
					Air temp	
Cal date: ____ / ____ / ____						
					Velocity	
					Cal date: ____ / ____ / ____	
<b>ALGAE SAMPLES</b>						
<b>Collection Method</b> (circle one or write new method if applicable)	<b>SWAMP EMAP</b>	<b>SWAMP EMAP</b>	<b>SWAMP EMAP</b>	<b>SWAMP EMAP</b>	<b>Water and Sediment Chemistry Samples</b>	
<b>Collection Device</b> (sum # of transects per device)	<b>Rep. 1</b>	<b>Rep. 2</b>	<b>Rep.</b>	<b>Rep.</b>		
Rubber Delimiter (area=12.6cm <sup>2</sup> )					Check if a WATER chemistry <b>grab</b> sample was collected (nutrients, SSC, etc.) <input type="checkbox"/>	
PVC Delimiter (area=12.6cm <sup>2</sup> )					Check if a DUPLICATE WATER chemistry <b>grab</b> sample was collected <input type="checkbox"/>	
Syringe Scrubber (area=5.3cm <sup>2</sup> )					Check if a SEDIMENT chemistry sample was collected <input type="checkbox"/>	
Other area=					Check if a DUPLICATE SED chemistry sample was collected <input type="checkbox"/>	
Number of transects sampled (0-11)					Sed Coll Device: SCOOP CORE GRAB	
Composite Volume (mL)					Material: Stainless Steel Polyethylene Polycarbonate Other	
Assemblage ID volume ( <b>diatoms</b> ) (50 mL tube)					Sediment Collection Depth (cm): 2 or 5	
Assemblage ID volume ( <b>soft algae</b> ) (50 mL tube)					Create Lab Collection records for each checked box for integrated and grab water chemistry samples	
Check if Qualitative Algae sample was collected with soft algae/diatom sample (required even if macroalgae not visible)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Check if a water chem. <b>integrated</b> sample was collected (chl, AFDM)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Chlorophyll a volume use GF/F filter (25 mL ( <b>preferred volume</b> ))						
Ash Free Dry Mass use GF/F filter (AFDM) volume (25 mL ( <b>preferred vol</b> ))						
<b>ADDITIONAL PHOTOGRAPHS</b>						
Description	Photo Code	Description	Photo Code			



Flow Habitat Type	DESCRIPTION
<b>Cascades</b>	Short, high gradient drop in stream bed elevation often accompanied by boulders and considerable turbulence
<b>Falls</b>	High gradient drop in elevation of the stream bed associated with an abrupt change in the bedrock
<b>Rapids</b>	Sections of stream with swiftly flowing water and considerable surface turbulence. Rapids tend to have larger substrate sizes than riffles
<b>Riffles</b>	Shallow sections where the water flows over stream bed particles that create mild to moderate surface turbulence; (< 0.5 m deep, > 0.3 m/s).
<b>Runs</b>	Long, relatively straight, low-gradient sections without flow obstructions. The stream bed is typically even and the water flows faster than it does in a pool; (> 0.5 m deep, > 0.3 m/s). A <b>step-run</b> is a series of runs separated by short riffles or flow obstructions that cause discontinuous breaks in slope
<b>Glides</b>	A section of stream with little or no turbulence; (< 0.5 m deep, < 0.3 m/s)
<b>Pools</b>	A reach of stream that is characterized by deep, low-velocity water and a smooth surface; (> 0.5 m deep, < 0.3 m/s)

**BANK STABILITY**

Although this measure of the degree of erosive potential is subjective, it can provide clues to the erosive potential of the banks within the reach. Assign the category whose description best fits the conditions in the area between the wetted channel and bankfull channel (see figure below)

<b>Eroded</b>	Banks show obvious signs of erosion from the current or previous water year; banks are usually bare or nearly bare
<b>Vulnerable</b>	Banks have some vegetative protection (usually annual growth), but not enough to prevent erosion during flooding
<b>Stable</b>	Bank vegetation has well-developed roots that protect banks from erosion; alternately, bedrock or artificial structures (e.g., concrete/ rip-rap) prevent bank erosion

Size Class Code	Size Class Range	Size Class Description	Common Size Reference
<b>RS</b>	> 4 m	bedrock, smooth	larger than a car
<b>RR</b>	> 4 m	bedrock, rough	larger than a car
<b>XB</b>	1 - 4 m	boulder, large	meter stick to car
<b>SB</b>	25 cm - 1.0 m	boulder, small	basketball to meter stick
<b>CB</b>	64 - 250 mm	cobble	tennis ball to basketball
<b>GC</b>	16 - 64 mm	gravel, coarse	marble to tennis ball
<b>GF</b>	2 - 16 mm	gravel, fine	ladybug to marble
<b>SA</b>	0.06 - 2 mm	sand	gritty to ladybug
<b>FN</b>	< 0.06 mm	fines	not gritty
<b>HP</b>	< 0.06 mm	hardpan (consolidated fines)	
<b>WD</b>	NA	wood	
<b>RC</b>	NA	concrete/ asphalt	
<b>OT</b>	NA	other	

**CPOM/ COBBLE EMBEDDEDNESS**

**CPOM:** Record presence (P) or absence (A) of coarse particulate organic matter (>1.0 mm particles) within 1 cm of each substrate particle; if point is dry, record Dry (D)

**Cobble Embeddedness:** Visually estimate % embedded by fine particles (record to nearest 5%)

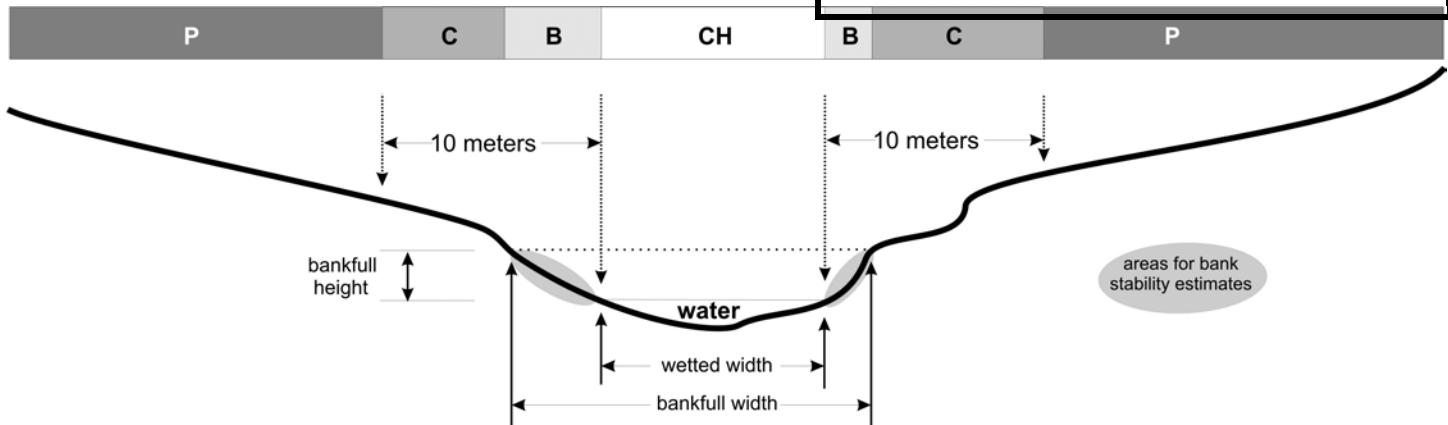
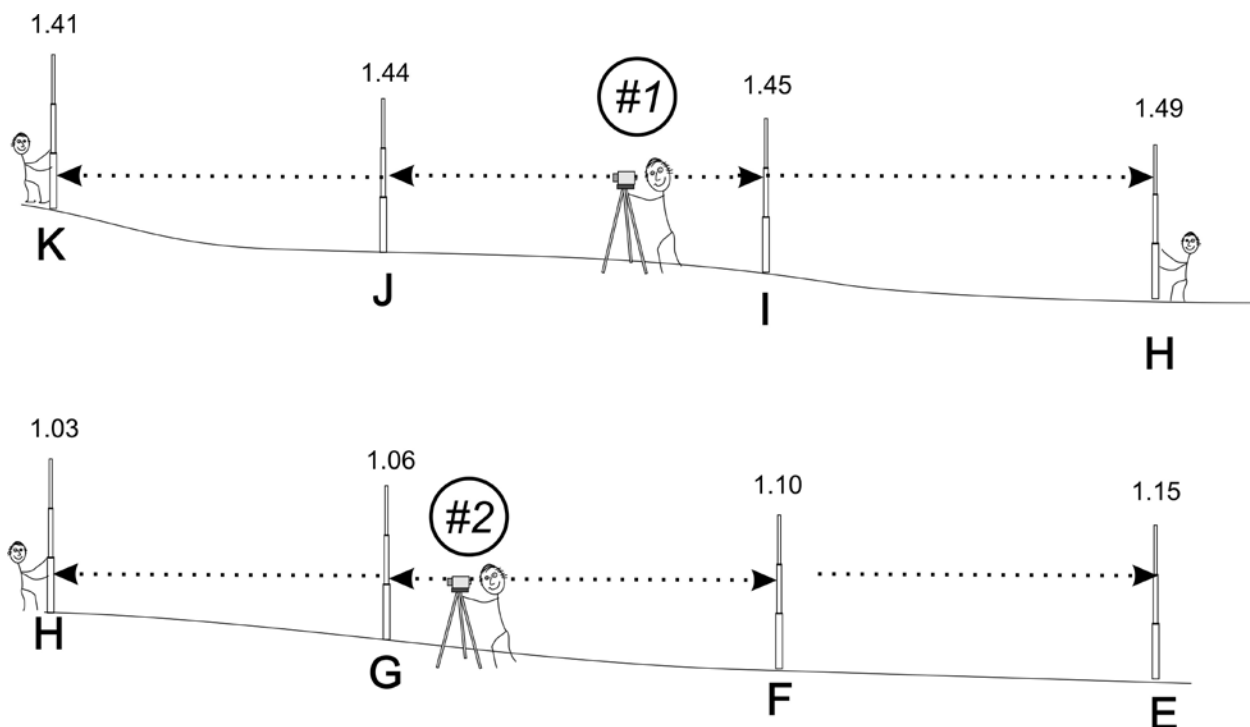


Figure 1. Cross-sectional diagram of stream transect indicating regions for assessing human influence measures:

- The measurement zone extends 5 meters upstream and 5 meters downstream of each transect
- Record one category for each bank and for the wetted channel (3 values possible)
- In reaches with wide banks, region "C" may be entirely overlapped by region "B"; in these cases, circle "B"
- Region "P" extends from 10 meters to the distance that can be seen from the channel, but not greater than 50 m

SLOPE and BEARING FORM							<b>AUTOLEVEL</b> <b>CLINOMETER</b> <b>HANDLEVEL</b>		<b>X</b>   			
<b>EXAMPLE</b>												
Starting Transect	MAIN SEGMENT (record percent of inter-transect distance in each segment if supplemental segments are used)						SUPPLEMENTAL SEGMENT (record percent of inter-transect distance in each segment if supplemental segments are used)					
	Stadia rod measurements		Slope (%) or Elevation Difference cm   %	Segment Length (m)	Bearing (0°-359°)	Percent of Total Length (%)	Stadia rod measurements		Slope or Elevation Difference cm   %	Segment Length (m)	Bearing (0°-359°)	Percent of Total Length (%)
<b>K</b>	1.41											
<b>J</b>	1.44		3	15	140	100						
<b>I</b>	1.45		1	15	145	100						
<b>H</b>	1.49	1.03	4	15	150	100						
<b>G</b>		1.06	3	15	143	100						
<b>F</b>		1.10	4	15	187	100						
<b>E</b>		1.15	5	15	195	100						



1. Level the auto-level at Position #1
2. Place base of stadia rod at water level every time
3. Sight to stadia rod at Transect K, then Transect J
4. Rotate scope and sight to Transects I and H
5. Move level to Position #2 and re-level

6. Re-sight to stadia rod at Transect H, then Transect G
7. Rotate scope and sight to Transects F and E

*Note: Sites will vary in the number of separate level positions needed to survey the reach.*