

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: / / 2016	Sample Collection Time:
Stream Name:		Site Name/ Description:	
Site Code:		Crew Members:	
Latitude (actual – decimal degrees): °N		datum: NAD83	GPS Device:
Longitude (actual – decimal degrees): °W		other:	

AMBIENT WATER QUALITY MEASUREMENTS					Actual Reach Length (m) <i>(see reach length guidelines at top of form)</i>
* Turbidity, silica, oxygen saturation, and air temp are optional; calibration date required on page 24					
Water Temp (Deg C)	pH	Alkalinity (mg/L)	Turbidity (ntu)*	Oxygen Sat. (%)*	
Dissolved O ² (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 st 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	Lower Section
5			15					Depth			
6			16					Depth 1			
7			17					Depth 2			
8			18					Depth 3			
9			19					Depth 4			
10			20					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 <small>(carry over from transect forms if needed to attain target count of 25; measure in %)</small>	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: ___ / ___ / 2016																			
SLOPE and BEARING FORM (transect based - for Full PHAB only)											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					
Epifaunal Substrate/Cover	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					
Score:	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Sediment Deposition	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)					
Score:	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Channel Alteration	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					
Score:	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: ___/___/2016
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):

Transect A

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 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%) 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	

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)	<input type="checkbox"/>
Upstream (required)	<input type="checkbox"/>

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	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
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: ___ / ___ / 2016
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):

Transect 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 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%) 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	

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

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	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
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: ___ / ___ / 2016
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):

Transect C

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 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%) 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	

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

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	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
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: ___/___/2016
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):

Transect D

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 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%) 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) count covered dots	
Center Left	
Center Upstream	
Center Right	
Center Downstream	
Left Bank	
Right Bank	

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

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	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
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: ___/___/2016
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):

Transect E

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 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%) 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) count covered dots	
Center Left	
Center Upstream	
Center Right	
Center Downstream	
Left Bank	
Right Bank	

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

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	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
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: ___/___/2016
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):

Transect F

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 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%) 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) count covered dots	
Center Left	
Center Upstream	
Center Right	
Center Downstream	
Left Bank	
Right Bank	

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 (required)	<input type="checkbox"/>

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	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
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: ___/___/2016
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):

Transect G

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 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 <small>(facing downstream, 5 m u/s, 5 m d/s, 10 m from wetted width)</small>	0 = Absent (0%) 3 = Heavy (40-75%) 1 = Sparse (<10%) 4 = Very Heavy (>75%) 2 = Moderate (10-40%)		INSTREAM HABITAT COMPLEXITY <small>(5 m u/s, 5 m d/s)</small>	0 = Absent (0%) 1 = Sparse (<10%) 2 = Moderate (10-40%) 3 = Heavy (40-75%) 4 = Very Heavy (>75%)	DENSIOMETER READINGS (0-17) <small>count covered dots</small>
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 <small>(circle only the closest to wetted channel; assess 5 m u/s, 5 m d/s)</small>	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 <small>(assess point of transect between wetted width and bankfull)</small>			
Left Bank	eroded	vulnerable	stable
Right Bank	eroded	vulnerable	stable

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	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
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: ___/___/2016
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):

Transect H

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 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%) 3 = Heavy (40-75%) 1 = Sparse (<10%) 4 = Very Heavy (>75%) 2 = Moderate (10-40%)	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) count covered dots
Vegetation Class	Left Bank	Right Bank		Center
Upper Canopy (>5 m high)				
Trees and saplings >5 m high	0 1 2 3 4	0 1 2 3 4		Left
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		Center Upstream
Ground Cover (<0.5 m high)				
Woody shrubs & saplings <0.5 m	0 1 2 3 4	0 1 2 3 4		Center Right
Herbs/ grasses	0 1 2 3 4	0 1 2 3 4		Center Downstream
Barren, bare soil/ duff	0 1 2 3 4	0 1 2 3 4		Left Bank
				Right Bank

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

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	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
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: ___/___/2016
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):

Transect I

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	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 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			
0 = Absent (0%) 3 = Heavy (40-75%) 1 = Sparse (<10%) 4 = Very Heavy (>75%) 2 = Moderate (10-40%)									0 = Absent (0%) 1 = Sparse (<10%) 2 = Moderate (10-40%) 3 = Heavy (40-75%) 4 = Very Heavy (>75%)					Center			
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	
Woody shrubs & saplings <0.5 m	0	1	2	3	4	0	1	2	3	4	Overhang. Vegetation	0	1	2	3	4	Left Bank
Herbs/ grasses	0	1	2	3	4	0	1	2	3	4	Live Tree Roots	0	1	2	3	4	Right Bank
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

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	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
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: ___/___/2016
Wetted Width (m):	Bankfull Width (m):	Bankfull Height (m):

Transect J

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

HUMAN INFLUENCE <small>(circle only the closest to wetted channel; assess 5 m u/s, 5 m d/s)</small>	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 <small>(assess point of transect between wetted width and bankfull)</small>			
Left Bank	eroded	vulnerable	stable
Right Bank	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	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
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	

Flow Habitat Type	DESCRIPTION
Cascades	Short, high gradient drop in stream bed elevation often accompanied by boulders and considerable turbulence
Falls	High gradient drop in elevation of the stream bed associated with an abrupt change in the bedrock
Rapids	Sections of stream with swiftly flowing water and considerable surface turbulence. Rapids tend to have larger substrate sizes than riffles
Riffles	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).
Runs	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 step-run is a series of runs separated by short riffles or flow obstructions that cause discontinuous breaks in slope
Glides	A section of stream with little or no turbulence; (< 0.5 m deep, < 0.3 m/s)
Pools	A reach of stream that is characterized by deep, low-velocity water and a smooth surface; (> 0.5 m deep, < 0.3 m/s)

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

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

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%)

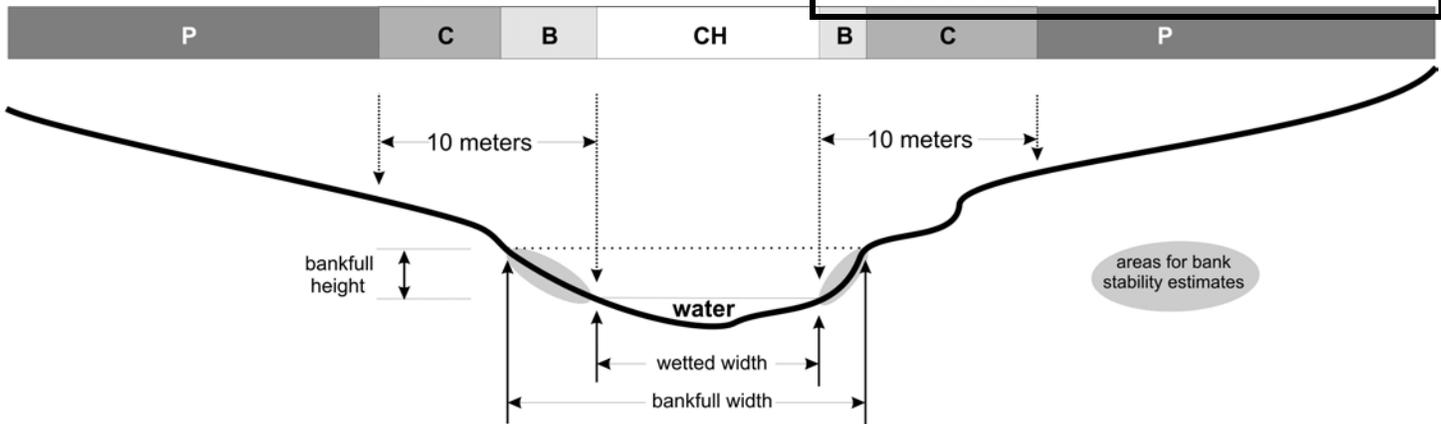
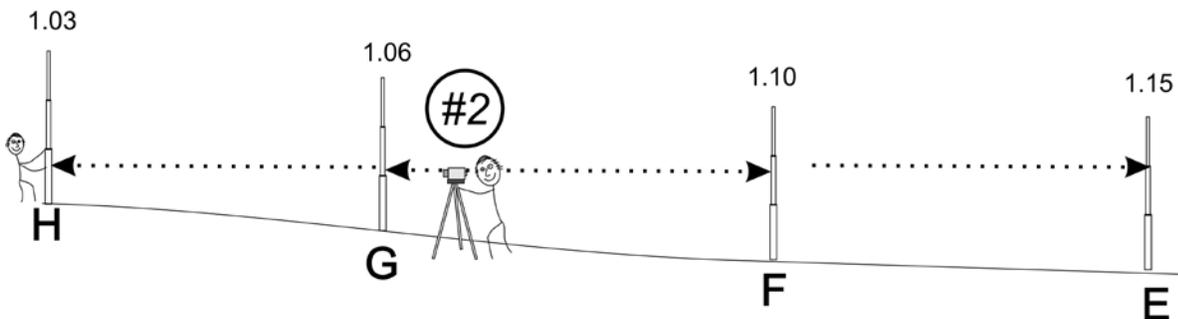
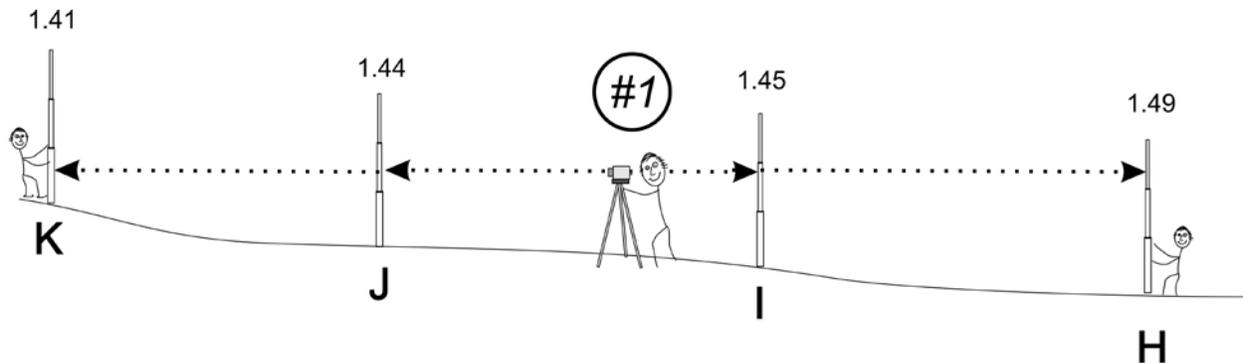


Figure 1. Cross-sectional diagram of stream transect indicating regions for assessing human influence measures:

- 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							AUTOLEVEL		CLINOMETER		HANDLEVEL		
							EXAMPLE					X	
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 (%)	
K	1.41												
J	1.44		3	15	140	100							
I	1.45		1	15	145	100							
H	1.49	1.03	4	15	150	100							
G		1.06	3	15	143	100							
F		1.10	4	15	187	100							
E		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.