

Worksheets

Equipment List

- ✓ Topographic Map, Land Use Map
 - ✓ Clip Board
 - ✓ Camera
 - ✓ Tape Measure (100 ft and 300 ft)
 - ✓ Clear Container (for water clarity assessment)
 - ✓ Boots
 - ✓ Pin Flags
 - ✓ D-frame or kick seine net
 - ✓ Buckets
 - ✓ Forceps
 - ✓ Spoons (plastic)
 - ✓ Pipettes
 - ✓ Sorting trays (large flat trays and ice cube trays)
 - ✓ Macroinvertebrate key (laminated)
 - ✓ Local plant ID book
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- ✓ First Aid Kit
 - ✓ Gloves

Stream Condition Assessment

Date :	Assessment Team:
Stream Name:	
City:	Site Location:
County:	Watershed:

Rain in last 24 hours

- heavy rain steady rain
 intermittent rain none

Present conditions

- heavy rain steady rain intermittent rain
 overcast partly cloudy clear/sunny

Amount of rain, if known? _____

Inches in last hours/days _____

Water Odor

- natural / none gasoline
 sewage chlorine
 rotten egg chemical
 other

Water Surface

- clear natural oily sheen
 foamy other
 oily sheen (petroleum product)

Water Clarity

Check all that apply (determine by viewing sample water in a clear container):

- turbid – suspended matter in water sediment blue/green algae other
 tannic – clear water that is naturally stained orange/brownish due to organic acids in water
 no staining / no suspended matter other (chemical discharges / dyes)

Table A1. Streambank Stability Parameter Scores.

Parameter	Excellent (4)	Good (3)	Fair (2)	Poor (1)	Score
Bank Height Ratio	1.0 – 1.2	1.2 – 1.5	1.5 - 2.0	> 2.0	
Root Depth Ratio	0.6 – 1.0	0.4 – 0.6	0.2 – 0.4	< 0.2	
Root Density %	60 – 100	40 – 60	20 – 40	< 20	
Bank Angle	< 45	45 – 60	60 – 75	> 75	
Surface Protection %	60 – 100	40 – 60	20 – 40	< 20	
Near Bank Stress	Low	Moderate	High	Very High	

Total Score (copy to Final Assessment Table) _____

Table A2. Bedform Channel Geomorphic Unit (CGU) Scores.

CGU Category	Excellent (4)	Good (3)	Fair (2)	Poor (1)	Score
Riffle	> 90 %	75 – 90 %	50 – 75 %	< 50 %	
Pool	> 90 %	75 – 90 %	50 – 75 %	< 50 %	
Run/Glide	> 90 %	75 – 90 %	50 – 75 %	< 50 %	
Structure-related habitat	> 90 %	75 – 90 %	50 – 75 %	< 50 %	

Total Score (copy to Final Assessment Table) _____

Table A3. Cover and Refuge Scores for Individual Cover Types.

Cover Type	Excellent (4)	Good (3)	Fair (2)	Poor (1)	Score
Undercut Banks	> 20 %	10 – 20 %	5 – 10 %	< 5 %	
Leaf Packs	> 20 %	10 – 20 %	5 – 10 %	< 5 %	
Overhanging Vegetation	> 20 %	10 – 20 %	5 – 10 %	< 5 %	
Pools > 2 ft	> 20 %	10 – 20 %	5 – 10 %	< 5 %	
Root Wads	> 20 %	10 – 20 %	5 – 10 %	< 5 %	
Boulders	> 20 %	10 – 20 %	5 – 10 %	< 5 %	
Oxbows, backwaters	> 20 %	10 – 20 %	5 – 10 %	< 5 %	
Aquatic Macrophytes	> 20 %	10 – 20 %	5 – 10 %	< 5 %	
Logs and Woody Debris	> 20 %	10 – 20 %	5 – 10 %	< 5 %	

Subtotal: _____

Table A4. Cover and Refuge Summary Scores.

Cover & Refuge Scores	Excellent (4)	Good (3)	Fair (2)	Poor (1)	Score
Overall Cover Percentage	> 75 %	25 – 75 %	5 – 25 %	< 5 %	
Total from Table A3	> 34	25 – 34	15 – 24	< 15	

Total Score (copy to Final Assessment Table) _____

Discussion:

EXAMPLE riparian habitat structure and diversity worksheet

Worksheet Vegetation Assessment (for Table B 1.)

Transect	1 Developing	2 immature	3 mature	4 missing
Structure – Percent of each parameter along 10 meter transect				
Bare soil	10	50	10	80
Herbaceous	20	10	20	20
Shrubs	5	5	40	0
Trees	15	0	30	0
Plant Species - identified by cover type, species and/or flood tolerance				
	Herb,grass,wet	Herb, grass,	Herb, juncus	Herb, juncus
	Tree, Water oak	Shrub, privet	Herb, grass	Herb, grass
	Tree, sweetgum	Shrub, unknown	Herb cattail	
	Shrub, privet		Shrub, alder	
	Shrub, hydrangea		Shrub, hydrangea	
			Shrub, Blueberry	
			Tree, Sweetgum	
			Tree, Water oak	
			Tree, Salix sp.	
Total Richness	5	3	9	2

Note presence of invasive, exotic species and relative amount, i.e. rare, common, abundant
Transect 2 dominated by privet

Table B1. Floodplain condition assessment (modified from Center for Watershed Protection 2005 and NRCS 2004- select appropriate score for each category and note on right)

Parameter	Excellent (4)	Good (3)	Fair (2)	Poor (1)	Score
Floodplain Connection	High flows (greater than bankfull) able to enter floodplain. Stream not deeply incised.	High flows (greater than bankfull) able to enter floodplain. Some incision occurring	High flows (greater than bankfull but less than 2X bankfull) not able to enter floodplain. Stream deeply entrenched.	High flows (greater than 2X bankfull) not able to enter floodplain. Stream deeply entrenched	
Vegetated Buffer Width	Width of buffer zone > 50 feet; human activities (i.e. parking lots, roadbeds, clear cuts, lawns, crops) have not impacted zone	Width of buffer zone 25-50 feet; human activities have impacted zone only minimally	Width of buffer zone 10-15 feet; human activities have impacted zone significantly	Width of buffer zone < 10 feet; little or no riparian vegetation due to human activities	
Riparian Vegetation Structural Complexity and Diversity**	Mature At least 3 classes of vegetation >30%	Developing At least one woody class and one herbaceous class >30%	Immature At least one woody and one herbaceous class >10%	Missing No woody class >10%	
Floodplain Habitat	Mix of wetland and non-wetland habitats, evidence of standing/pooling water	Mix of wetland and non-wetland habitats, no evidence of standing/pooling water	Either all wetland or all non-wetland habitat, evidence of standing/pooling water	Either all wetland or all non-wetland habitat, no evidence of standing/pooling water	
Floodplain Encroachment	No evidence of floodplain encroachment in the form of fill material, land development, or manmade structures	Minor floodplain encroachment in the form of fill material, land development, or manmade structures, but not affecting floodplain function	Moderate floodplain encroachment in the form of filling, land development, or manmade structures, some effect on floodplain function	Significant floodplain encroachment (i.e. fill material, land development, or manmade structures), significant effect of floodplain function	
Percent Exposed or Bare Ground	10% or less of the site with exposed soil surface	10% to 20% of the site has exposed soil surface	20% to 50% of the site has exposed soil surface	> 50% of the site has exposed soil surface	

Stormwater Outfall Quality (urban projects only)	<u>Excellent</u> Outfalls appear stable. Little evidence of erosion or degradation. Energy dissipation and treatment is evident.	<u>Good</u> Outfalls have very few problems and are generally stable. Attention has been paid to the design, and some treatment and energy dissipation is expected	<u>Fair</u> Design appears to consider outfalls. However, exhibits limited ability to either dissipate energy or treat runoff.	<u>Poor</u> Little to no attention was paid to storm outfalls. Outfalls are failing or are a source of stream floodplain erosion. Either energy dissipation or treatment.	
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Final Score _____ (copy to Final Assessment Table)

**** If riparian vegetation is predominantly invasive, exotic then assign a score of poor or fair.**

Discussion:

Existing land use or management practices may directly impact complexity of riparian vegetation (examples: active mowing to stream edge, weed-eating of grasses). Please note these activities.

Worksheet Vegetation Assessment

(for Table B 1. Riparian Vegetation Structural Complexity and Diversity)

Transect	1	2	3	4
Structure – Percent of each parameter along 10 meter transect				
Bare soil				
Herbaceous				
Shrubs				
Trees				
Plant Species - identified by cover type, species and/or flood tolerance				
Total Richness				

Note presence of invasive, exotic species and relative amount, i.e. rare, common, abundant

Cover Types

Herbaceous: grasses, leafy plants, structure dies back to ground in winter

Shrub: woody plants, often multiple stems, less than 20 feet tall, less than 2.5 inches dbh

Tree: woody plants, often single trunk, greater than 20 feet tall

(dbh – diameter breast height. If you can reach your hand (finger to thumb) around the stem at chest height, then it is generally categorized as a tree.)

Example Bio-assess tally:

- 15 Mayfly
- 40 Stonefly
- 3 Riffle Beetle
- 12 Crayfish
- 5 Blackfly larvae
- 20 Aquatic worms

GROUP 1 TAXA	Letter Code	GROUP 2 TAXA	Letter Code	GROUP 3 TAXA	Letter Code
Mayfly	A	Hellgramite		Aquatic Worm	A
Stonefly	A	Dragonfly		Midge	
Caddisfly		Cranefly		Pouch Snail**	
Riffle Beetle	R	Filtering Caddisfly*			
Snail		Crayfish	A		
		Scud			
		Sowbug			
		Snipefly			
		Blackfly	C		
Number of Taxa = <u>3</u>		Number of Taxa = <u>2</u>		Number of Taxa = <u>1</u>	
Multiply by 3 = <u>9</u>		Multiply by 2 = <u>4</u>		Multiply by 1 = <u>1</u>	
(Index Value)		(Index Value)		(Index Value)	

Final Bio-assess Stream Quality Assessment score = 14 or Fair

Table C1.

BIO-ASSESS® STREAM QUALITY ASSESSMENT FORM					
Stream Name _____					
Location _____					
City _____ St _____ County _____ Date _____					
Monitoring Group Name _____ Time _____					
MACROINVERTEBRATE TALLY			<i>Letter Code: R = 1 to 3 individuals (Rare) For Tally C = 4 to 9 (Common) A = 10 or more (Abundant)</i>		
GROUP 1 TAXA	Letter Code	GROUP 2 TAXA	Letter Code	GROUP 3 TAXA	Letter Code
Mayfly		Hellgramite		Aquatic Worm	
Stonefly		Dragonfly		Midge	
Caddisfly		Cranefly		Pouch Snail**	
Riffle Beetle		Filtering Caddisfly*			
Snail		Crayfish			
		Scud			
		Sowbug			
		Snipefly			
		Blackfly			
Number of Taxa = _____ Multiply by 3 = _____ (Index Value)		Number of Taxa = _____ Multiply by 2 = _____ (Index Value)		Number of Taxa = _____ Multiply by 1 = _____ (Index Value)	
<p>* Filtering Caddisflies are in the Family Hydropsychidae (gills on abdomen; most common caddisfly) ** Pouch snails are in the Family Physidae (shell opens to the left; air-breathing snail)</p>					
Total Number of Taxa (Sum of each number of Taxa in each group)		STREAM QUALITY ASSESSMENT (Check box corresponding to Cumulative Index Value)			
<input style="width: 50px; height: 30px;" type="text"/>		Excellent (>22)	<input style="width: 50px; height: 30px;" type="text"/>	Good (17-22)	<input style="width: 50px; height: 30px;" type="text"/>
Cumulative Index Value (Sum of Index Values for each group)		Fair (11-16)	<input style="width: 50px; height: 30px;" type="text"/>	Poor (<11)	<input style="width: 50px; height: 30px;" type="text"/>
<input style="width: 50px; height: 30px;" type="text"/>					
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Final Score _____ (copy to Final Assessment Table)

Final Assessment Table

CATEGORY	METRIC	RANGE OF SCORES	SOURCE	SCORE	DIVIDE BY	ADJUSTED SCORE
Channel Condition	Streambank Stability	6 – 24	Table A1		6	
	Bedform Condition	4 – 16	Table A2		4	
	Cover and Refuge	2 – 8	Table A4		2	
Riparian Condition	Floodplain and Riparian Vegetation Condition	7 – 28	Table B1		7	
Aquatic Insects	Bio-Assess	11-28	Table C1		7	
Final Score						