ACT FIELD SAMPLING SHEET (Version 2.5 Dec 2000)

DATE ..... **TIME** ..... **LOCATION CODE** .....

RIVER ..... **LOCATION** .....

PROJECT ..... **TEST/REFERENCE SITE** .....

RECORDERS NAME ..... **PHOTOGRAPH NUMBER (S)** .....

WEATHER ..... **AIR TEMPERATURE** .....^{o}C

CLOUD COVER .....% **RAIN IN LAST WEEK ?** **YES [ ]** **NO [ ]**

MEASUREMENTS **Water sample(s)[1] taken? Yes [ ] Number..... No [ ]**

	Instrument			
Water Temperature[1] (^{o}C)	.....	.....	**Barometric Pressure (millibars)**	.....
Conductivity[1] (μS cm^{-1})	.....	.....	**Alk. H_2SO_4 (ml)/H_2O (ml)**	...../.....
pH[1]	.....	.....	**Alkalinity (mg l^{-1})**	.....
Dissolved Oxygen[1] (mg l^{-1})	.....	.....	**NOX (mg l^{-1})**	.....
% Sat. Dissolved Oxygen[1]	.....	.....	**Total Phosphorus (mg l^{-1})**	.....
Turbidity[1] (NTU)	.....	.....	**Total Nitrogen (mg l^{-1})**	.....

Bank Height[2] .....**m** **Bank-Full Width[3]** .....**m** **Length of Reach[4]**.....**m**

Stream Widths[5] within Reach[4] (m) Min..... Max..... Mode.....

% habitat area in Reach[4]	**Depth[6] (cm)** 1	2	3	mean (cm)	**Velocity[6,7] (revs/30sec [ ] / m s^{-1} [ ])[8]** U / L	U / L	U / L	mean (m s^{-1})
Riffle[9]	.....	.....	.....	.....	...../.....	...../.....	...../.....	.....
Pool[9]								
Run[9]								
Edge[10] ...../100	.....	.....	.....	.....	...../.....	...../.....	...../.....	.....
M'phyt ...../100	**Flow meter type**.....						**Flow meter fan no.**	

[1] Measured/sampled from riffle, or centre of stream if no riffle is present. [2] Measured from water surface vertical to top of bank (bank-full height). [3] Distance between tops of banks (top of bank as determined in note 2). [4] Reach: 5 times the mode bank-full width either side of riffle sampling site, unless bank-full width <10m then the minimum reach length = 100m. [5] Measured from edges of water. [6] If depth ≥ 30cm then measure flow at 4/5 depth (U = Upper) & at 1/5 depth (L = Lower); if <30cm, measure at 1/2 depth only. [7] Three measurements taken to encompass flow variability within habitats. [8] Indicate units used to record flow. [9] Riffle, Pool & Run together must total 100. [10] Length of both banks as % of reach length that can be effectively sampled with sweep net.

RIPARIAN VEGETATION

Width of riparian zone[11] within reach[4]: estimated / measured left bank[12] .....m
estimated / measured right bank[12] .....m

Vegetation type:	% Cover of riparian zone[13]	Description
trees (>10m)	.....	.....
trees (<10m)	.....	.....
shrubs	.....	.....
grasses / ferns / sedges	.....	.....

Shading of river[14]: **1** = <5% [ ] **2** = 6-25% [ ] **3** = 26-50% [ ] **4** = 51-75% [ ] **5** = >76% [ ]

Native vegetation[15] .....%
Exotic vegetation[15] .....%

[11] Area where waterway interacts with vegetation. [12] Facing downstream. [13] From 'plan' view, estimation of outline cover; may or may not total >100%. [14] Estimate as if sun directly overhead. [15] Native & Exotic vegetation together must total 100%.

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OBSERVATIONS (Circle appropriate category)

WATER ODOURS: **1. Normal** **2. Sewage** **3. Petroleum** **4. Chemical** **5. None**

WATER OILS: **1. Slick** **2. Sheen** **3. Globs** **4. Flecks** **5. None**

TURBIDITY: **1. Clear** **2. Slight** **3. Turbid** **4. Opaque**

PLUME: **1. Little** **2. Some** **3. Lots**
(amount of fine sediment generated when kick-sampling)

SEDIMENT OILS: **1. Absent** **2. Light** **3. Moderate** **4. Profuse**

SEDIMENT ODOURS: **1. Normal** **2. Sewage** **3. Petroleum** **4. Chemical**
5. Anaerobic **6. None** **7. Other.....**

FLOW LEVEL: (relative to "water mark" ie. normal inundation level shown by limit of terrestrial grasses, or by eroded area, or boundary in bank sediment types).
1. No flow (dry / isolated) **2. Low** (<water mark) **3. Moderate** (=) **4. High** (>water mark) **5. Flood**

Bare ground above water mark: area in riparian zone expected to be vegetated but bare. **Left bank**[12] **.....%**
Right bank[12]**.....%**

Are the undersides of stones which are not deeply embedded black? **1. Yes** **2. No**

SEDIMENT DEPOSITS: **1. None** **2. Sludge** **3. Sawdust** **4. Paper fibre**
5. Sand **6. Relict shells** **7. Silt** **8. Other.....**

LOCAL CATCHMENT EROSION: **1. None** **2. Some** **3. Moderate** **4. Heavy**

LOCAL PS[16] **POLLUTION:** **1. No evidence** **2. Potential.....** **3. Obvious.....**

LOCAL NPS[16] **POLLUTION:** **1. No evidence** **2. Potential.....** **3. Obvious.....**

DAMS / BARRIERS: **1. Present - Upstream / Downstream** **2. Absent**

RIVER BRAIDING: **1. Yes - No. of braids .....** **2. No**

SITE CLASSIFICATION[17]**:**
1. Steep valley **2. Broad valley** **3. Wetland/bog** **4. Heath**
5. Levees present **6. Stream bars** **7. Natural riparian meadow** **8. Other.....**

LANDUSE[17]**:** **1. Native forest** **2. Forestry** **3. Grazing** **4. Native grassland (no grazing)**
Left Bank[12] **5. Exotic grassland (no grazing)** **6. Cropped** **7. Residential**
8. Commercial **9. Industrial** **10. Recreational** **11. Other.....**

LANDUSE[17]**:** **1. Native forest** **2. Forestry** **3. Grazing** **4. Native grassland (no grazing)**
Right Bank[12] **5. Exotic grassland (no grazing)** **6. Cropped** **7. Residential**
8. Commercial **9. Industrial** **10. Recreational** **11. Other.....**

BARS: (bed surface protruding from normal water level & forming a bar) **.....%**

[12] Facing downstream. [16] PS = Point Source, NPS = Non Point Source. [17] Within the reach measurements; may indicate more than one category if required.

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REACH[4]

SUBSTRATUM DESCRIPTION (% cover): **ORGANIC SUBSTRATUM** (% cover of inorganic substrate)

			PHI		
Bedrock		[.....]	-9.5	**Detritus (sticks, wood, CPOM[18])**	**[.....]**
Boulder	(>256mm)	[.....]	-9.0	**Muck/Mud (black, very fine organics)**	**[.....]**
Cobble	(64-256mm)	[.....]	-6.5		
Pebble	(16-64mm)	[.....]	-4.5		
Gravel	(2-16mm)	[.....]	-2.0		
Sand	(0.06-2mm)	[.....]	2.0		
Silt	(0.004-0.06mm)	[.....]	6.5		
Clay	(<0.004mm)	[.....]	9.5		

Percent of reach covered by:	**Category**				
Periphyton	**1**	**2**	**3**	**4**	**5**
Moss	**1**	**2**	**3**	**4**	**5**
Filamentous algae	**1**	**2**	**3**	**4**	**5**
Macrophytes	**1**	**2**	**3**	**4**	**5**

1= <10% 2=10-35% 3=35-65% 4=65-90% 5=>90%

[4] Reach: 5 times the mode bank-full width either side of riffle sampling site, unless bank-full width <10m then the minimum reach length = 100m.
[18] Course Particulate Organic Material.

RIFFLE

Macroinvertebrates collected by .....
Macroinvertebrates picked/ sorted by .....
Method: Kicknet [ ] Other.....
Length of riffle sampled 10 metres [ ] Other.....metres.
Sample preserved [ ]

SUBSTRATUM DESCRIPTION (% cover): **ORGANIC SUBSTRATUM** (% cover of inorganic substrate)

			PHI		
Bedrock		[.....]	-9.5	**Detritus (sticks, wood, CPOM[18])**	**[.....]**
Boulder	(>256mm)	[.....]	-9.0	**Muck/Mud (black, very fine organics)**	**[.....]**
Cobble	(64-256mm)	[.....]	-6.5		
Pebble	(16-64mm)	[.....]	-4.5		
Gravel	(2-16mm)	[.....]	-2.0		
Sand	(0.06-2mm)	[.....]	2.0		
Silt	(0.004-0.06mm)	[.....]	6.5		
Clay	(<0.004mm)	[.....]	9.5		

Percent of riffle covered by:	**Category**				
Periphyton	**1**	**2**	**3**	**4**	**5**
Moss	**1**	**2**	**3**	**4**	**5**
Filamentous algae	**1**	**2**	**3**	**4**	**5**
Macrophytes	**1**	**2**	**3**	**4**	**5**

1= <10% 2=10-35% 3=35-65% 4=65-90% 5=>90%

[18] Course Particulate Organic Material.

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EDGE / BACKWATER:

Macroinvertebrates collected by .....
Macroinvertebrates picked/ sorted by .....
Method: Sweep [ ] Other.....
Length of edge sampled 10 metres [ ] Other.....metres.
Sample preserved [ ]

SUBSTRATUM DESCRIPTION (% cover): **ORGANIC SUBSTRATUM** (% cover of inorganic substrate)

		PHI
Bedrock	[.....]	-9.5
Boulder (>256mm)	[.....]	-9.0
Cobble (64-256mm)	[.....]	-6.5
Pebble (16-64mm)	[.....]	-4.5
Gravel (2-16mm)	[.....]	-2.0
Sand (0.06-2mm)	[.....]	2.0
Silt (0.004-0.06mm)	[.....]	6.5
Clay (<0.004mm)	[.....]	9.5

Detritus (sticks, wood, CPOM[18]) [.....]
Muck/Mud (black, very fine organics) [.....]

Trailing Bank Vegetation:
1=nil [ ] 2=slight [ ] 3=moderate [ ] 4=extensive [ ]
Description:
.....

Percent of edge covered by:	**Category**				
Periphyton	**1**	**2**	**3**	**4**	**5**
Moss	**1**	**2**	**3**	**4**	**5**
Filamentous algae	**1**	**2**	**3**	**4**	**5**
Macrophytes	**1**	**2**	**3**	**4**	**5**

1= <10% 2=10-35% 3=35-65% 4=65-90% 5=>90%

[18] Course Particulate Organic Material.

MACROPHYTES

Indicate whether the following common taxa are present in the reach:

SUBMERGED/ FLOATING

Ceratophyllum (Hornwort) .....
Chara (Stonewort).....
Elodea (Canadian Pondweed) .....
Myriophyllum (Water Milfoil) .....
Nitella (Stonewort) .....
Potamogeton (Pondweed) .....
Triglochin (Water Ribbon) .....
Vallisneria (Ribbonweed) .....
Other .....
.....
.....
.....
.....

EMERGENT

Callitriche (Starwort).....
Carex (Tussock Sedge) .....
Crassula (Crassula) .....
Cyperus (Sedge).....
Eleocharis (Spikerush).....
Juncus (Rush).....
Paspalum (Water Couch) .....
Polygonum (Smartweed) .....
Phragmites (Common Reed).....
Ranunculus (Buttercup) .....
Scirpus (Clubrush).....
Typha (Cumbungi).....
Other .....

Vegetation samples collected: Yes [ ] No [ ]

Epiphyte cover on macrophytes Nil [ ] Slight [ ] Moderate [ ] Extensive [ ]

Notes:

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RIVER..... DATE..... LOCATION CODE.....

	CATEGORY			
Habitat Variable	**Excellent**	**Good**	**Fair**	**Poor**
1. Bottom substrate/available cover	Greater than 50% rubble, gravel submerged logs, undercut banks or other stable habitat 20, 19, 18, 17, 16	30-50% rubble, gravel or other stable habitat. Adequate habitat 15, 14, 13, 12, 11	10-30% rubble, gravel or other stable habitat. Habitat avail-ability less than desirable 10, 9, 8, 7, 6	Less than 10% rubble, gravel or other stable habitat. Lack of habitat is obvious 5, 4, 3, 2, 1, 0
2. Embeddedness	Gravel, cobble and boulder particles are between 0 & 25% surrounded by fine sediment 20, 19, 18, 17, 16	Gravel, cobble and boulder particles are between 25 & 50% surrounded by fine sediment 15, 14, 13, 12, 11	Gravel, cobble and boulder particles are between 50 & 75% surrounded by fine sediment 10, 9, 8, 7, 6	Gravel, cobble and boulder particles are over 75% surrounded by fine sediment 5, 4, 3, 2, 1, 0
3. Velocity/depth category	Slow deep (<0.3 m/s & >0.5m); Slow shallow; Fast deep; Fast shallow; habitats all present 20, 19, 18, 17, 16	Only 3 of the four habitat categories present (missing riffles or runs receive lower score than missing pools) 15, 14, 13, 12, 11	Only 2 of the four habitat categories present (missing riffles/ runs receive lower score) 10, 9, 8, 7, 6	Dominating by one velocity/depth category (usually pool) 5, 4, 3, 2, 1, 0
4. Channel alteration	Little or no enlargement of islands or point bars and/or no channelisation 15, 14, 13, 12	Some new increase in bar formation, mostly from coarse gravel; and/or some channel-isation present 11, 10, 9, 8	Moderate deposition of new gravel, coarse sand, on old and new bars; pools partly filled w/silt; and/or embankments on both banks 7, 6, 5, 4	Heavy deposits of fine materials, increased bar development; most pools filled with silt; and/or extensive channelisation 3, 2, 1, 0
5. Bottom scouring and deposition	Less than 5% of the bottom affected by scouring and deposition 15, 14, 13, 12	5-30% affected. Scours at constrictions and where grades steepen, some deposition in pools 11, 10, 9, 8	30-50% affected. Deposits and scours at obstruction and bends. Some deposition in pools. 7, 6, 5, 4	More than 50% of the bottom changing nearly year long. Pools almost absent due to deposition. Only large rocks in riffle exposed 3, 2, 1, 0

RIVER..... DATE..... LOCATION CODE.....

	CATEGORY			
Habitat Variable	**Excellent**	**Good**	**Fair**	**Poor**
6. Pool/riffle, run/bend ratio *(Distance between riffles divided by stream width)*	0-7 Variety of habitat. Deep riffles and pools 15, 14, 13, 12	7-15 Adequate depth in pools and riffles. Bends provide habitat 11, 10, 9, 8	15-25 Occasional riffle or bend. Bottom contours provide some habitat. 7, 6, 5, 4	>25 Essentially a straight stream. Generally all flat water or shallow riffle. Poor habitat. 3, 2, 1, 0
7. Bank stability	Stable. No evidence of erosion or bank failure. Side slopes generally <30%. Little potential for future problem. 10, 9	Moderately stable. Infrequent, small areas of erosion mostly healed over. Side slopes up to 40% on one bank. Slight potential in extreme floods 8, 7, 6	Moderately unstable. Moderate frequency and size of erosional areas. Side slopes up to 60% on some banks. High erosion potential during extreme/high flows 5, 4, 3	Unstable. Many eroded areas. Side slopes > 60% common. "Raw" areas frequent along straight sections and bends. 2, 1, 0
8. Bank vegetative stability	Over 80% of the streambank surfaces covered by vegetation or boulders and cobble 10, 9	50-79% of the streambank surfaces covered by vegetation, gravel or larger material 8, 7, 6	25-49% of the streambank surfaces covered by vegetation, gravel or larger material 5, 4, 3	Less than 25% of the streambank surfaces covered by vegetation, gravel or larger material 2, 1, 0
9. Streamside vegetation cover	Dominant vegetation is of tree form 10, 9	Dominant vegetation shrub 8, 7, 6	Dominant vegetation is grass, sedge, ferns 5, 4, 3	Over 50% of the streambank has no vegetation and dominant material is soil, rock, bridge materials, culverts, or mine tailings 2, 1, 0

Total Habitat Score

From US EPA RBA Protocols 1989

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