FIELD SAMPLING AND HABITAT ASSESSMENT SHEETS (ver 7 9/2/99)

DATE ..... **TIME** ..... **LOCATION CODE** .....
RIVER ..... **LOCATION** .....
RECORDERS NAME ..... **PHOTOGRAPH NUMBER (S)**.....
MAP DRAWN/MODIFIED..... **AIR TEMPERATURE** .....**^{o}C**
RAIN IN LAST WEEK ? Y [ ] N [ ] **LOCATION NOTED IN BASIN BOOK**.....

AMG.....
.....
LATITUDE.....**LONGITUDE**.....
.....

RIPARIAN VEGETATION

Width of riparian zone[1]: estimated / measured left bank[2] .....…….....**m**
estimated / measured right bank[2] ....……**m**

Vegetation type:	**% Cover of riparian zone[3]**	**Description**
trees (>10m)	.....	.....
trees (<10m)	.....	.....
shrubs / vines	.....	.....
grasses / ferns / sedges	.....	.....

Vegetation cover of river[4]: <5% [ ] 6-25% [ ] 26-50% [ ] 51-75% [ ] >76% [ ]

Cover of Exotic vegetation[5]	0%(4)	1-10%(3)	11-40%(2)	41-60%(1)	>60%(0)
Overstorey	**[ ]**	**[ ]**	**[ ]**	**[ ]**	**[ ]**
Shrub Layer	**[ ]**	**[ ]**	**[ ]**	**[ ]**	**[ ]**
Groundcover	**[ ]**	**[ ]**	**[ ]**	**[ ]**	**[ ]**

[1] Area where waterway interacts with vegetation. [2] Facing downstream. [3] From 'Plan' view, estimation of outline cover; may total >100%. [4] Estimate as at midday. [5] Total may be >100%. [6]. From edge of water to cleared land.

MEASUREMENTS:

Stream Width[6] (m) **1**..... **2**..... **3**..... **channel width[7]** .....**m** **bank height[8]**.....**m**
(Max.) (Min.) (Mean)

Water Temperature[9] (^{o}C) ..... **pH[9]** .....
Conductivity[9] (uS/cm,ambient) ..... **Alkalinity..(mg/L).....** .....
Conductivity (uS/cm @ 25 ^{o}C) ..... **Turbidity[9] (FTU)** .....
Dissolved Oxygen[9] (mg/l) ....
% Sat. Dissolved Oxygen..... ....

Depth[11] (cm)				**Flow[11,12] (revs/30sec)**		
1	**2**	**3**	**Mean**	**U / L**	**U / L**	**U / L**
.....…….....				...../.....	...../.....	...../.....

Flow meter fan no. .....

% in Reach[10] **Riffle** …… **Pool** ..... **Macrophyte** ..... **Run** .....

[6] From edges of water. [7] From tops of banks. [8] From water surface vertical to top of bank. [9] Measured/sampled from riffle area. [10] Within 'Reach' :ie. 5 times mean water width either side of riffle sampling site. [11] U = Upper, at 4/5 depth; L = Lower, at 1/5 depth; if <30cm, measure at 1/2 depth only. [12] Measurements at 1/4, 1/2, 3/4 width along mean width transect.

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

OBSERVATIONS (Indicate appropriate number in box)

WATER ODOURS: **1. normal** **2. sewage** **3. petroleum** **4. chemical** **5.stormwater** **6. musty** **[ ]**

WATER OILS: **1. slick** **2. sheen** **3. globs** **4. flecks** **5. none** **[ ]**

TURBIDITY: **1. clear** **2. slight** **3. turbid** **4.opaque/liquid silt (clay like)** **[ ]**

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 normal inundation level shown by above: **Left bank**.....**%** **Right bank**.....**%**

SEDIMENT DEPOSITS: **1. none** **2. sludge** **3. sand** **4. floc/silt (very light)** **5. other** **[ ]**

LOCAL CATCHMENT EROSION (within sight of site) **1. none** **2. moderate** **3. heavy** **[ ]**

LOCAL NPS POLLUTION: **1. no evidence** **2. potential**.....**3. obvious**..... **[ ]**

LOCAL PS POLLUTION: **1. STP** **2. road** **3. other**..... **[ ]**

DAMS / BARRIERS (local) **1. present upstream / downstream** **2. absent** **3. river regulated** **[ ]**

BRAIDING: **1. yes** **no. of channels** ..... **2. no** **[ ]**

SITE CLASSIFICATION: **1. steep valley** **2. broad valley** **3. wetland/bog** **4. heath**
(indicate >1 if required) **5. plains** **6. natural riparian meadow** **[ ]**

LANDUSE: **1. Native forest** **2. Forestry** **3. Native pasture** **4. Grazing** **5. Cropped**
Left Bank^2 **6. Residential** **7. Industrial** **8. Recreational** **[ ]**

LANDUSE: **1. Native forest** **2. Forestry** **3. Native pasture** **4. Grazing** **5. Cropped**
Right Bank^2 **6. Residential** **7. Industrial** **8. Recreational** **[ ]**

VEGCAT (for AUSRIVAS)
1. Urban/Residential **2. Intensive agriculture/some residential**
3. Some forestry/agriculture(eg grazing) **4. Native forest/natural vegetation** **[ ]**

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

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

REACH[10]

Length of Reach[10].....metres.

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[14]) [.....]
Muck/Mud (black, very fine organics) [.....…]
FPOM/CPOM categories 1= <5%
2 = 5 - 20 %
3 = >20 %

Moss	**0**	**1**	**2**	**3**	**4**	**(percent of reach covered by)**
Filamentous algae	**0**	**1**	**2**	**3**	**4**	**(percent of reach covered by)**
Macrophytes	**0**	**1**	**2**	**3**	**4**	**(percent of reach covered by)**

0= <10% 1=10-35% 2=35-65% 3=65-90% 4=>90%

[10] 'Reach' :ie. 5 times mean water width either side of riffle sampling site.

[14] Coarse Particulate Organic Material.

RIFFLE

Macroinvertebrates collected by .....
Macroinvertebrates picked/ sorted by .....
Length of riffle sampled 10 metres [ ] Other.....**metres.**
Sample preserved [ ]
Time taken to pick sample:.....

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

			PHI
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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[14]) [.....]
Muck/Mud (black, very fine organics) [.....]
FPOM/CPOM categories 1= <5%
2 = 5 - 20 %
3 = >20 %

Moss	**0**	**1**	**2**	**3**	**4**	**(percent of riffle covered by)**
Filamentous algae	**0**	**1**	**2**	**3**	**4**	**(percent of riffle covered by)**
Macrophytes	**0**	**1**	**2**	**3**	**4**	**(percent of riffle covered by)**

0= <10% 1=10-35% 2=35-65% 3=65-90% 4=>90%

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

EDGE / BACKWATER (where sample was taken)**:**

Macroinvertebrates collected by .....
Macroinvertebrates picked/ sorted by .....
Length of edge sampled 10 metres [ ] Other.....**metres.**
Sample preserved [ ]
Time taken to pick sample:.....

ORGANIC SUBSTRATUM (% cover of inorganic substrate)

Detritus (sticks, wood, CPOM[14]**) [.....]**
Muck/Mud (black, very fine organics) [.....]
FPOM/CPOM categories 1= <5%
2 = 5 - 20 %
3 = >20 %

Trailing bank Vegetation:
nil [ ] slight (<10%) [ ] moderate (10-30%) [ ] extensive (.>30%) [ ]
Edge description.(plants sampled in sweep).....
.....

Percentage of edge covered by:	**backwaters [ ]**
	leaf packs [ ]
	undercut banks [ ]
	roots [ ]
	other.....

Moss	**0**	**1**	**2**	**3**	**4**	**(percent of edge covered by)**
Filamentous algae	**0**	**1**	**2**	**3**	**4**	**(percent of edge covered by)**
Macrophytes	**0**	**1**	**2**	**3**	**4**	**(percent of edge covered by)**

0= <10% 1=10-35% 2=35-65% 3=65-90% 4=>90%

MACROPHYTES IN REACH

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

SUBMERGED/ FLOATING	EMERGENT
Ceratophyllum (Hornwort)	*Callitriche* (Starwort).....
Chara (Stonewort).....	*Carex* (Tussock Sedge) .....
Elodea (Canadian Pondweed)	*Crassula* (Crassula) .....
Myriophyllum (Water Milfoil)	*Cyperus* (Sedge).....
Nitella (Stonewort)	*Eleocharis* (Spikerush).....
Potamogeton (Pondweed)	*Juncus* (Rush).....
Triglochin (Water Ribbon)	*Paspalum* (Water Couch) .....
Vallisneria (Ribbonweed)	*Polygonum* (Smartweed) .....
Other	*Phragmites* (Common Reed).....
.....	*Ranunculus* (Buttercup) .....
.....	*Scirpus* (Clubrush).....
.....	*Typha* (Cumbungi).....
.....	Other .....

Number of plant species .....

Vegetation samples collected: Yes [ ] No [ ]

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

RIVER.....…….. **DATE**..... **LOCATION CODE**.....

HIGH GRADIENT STREAMS

Habitat Parameter	Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Epifaunal substrate/ available cover	Greater than 50% of substrate favourable for epifaunal colonisation and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonisation potential (logs/snags are not newly fallen and not transient)	30-50% mix of stable habitat; well-suited for full colonisation potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newly fallen logs but not yet "seasoned" (may rate at high end of scale)	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat 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**
2. Riffle quality	Well developed riffle and run; riffle is as wide as stream and length extends two times the width of stream; abundance of cobble (boulders prevalent in headwater streams)	Riffle as wide as stream but length is less than 2 times width; abundance of cobble; boulders and gravel common	Run area may be lacking; riffle not as wide as stream and its length is less than 2 times the stream width; gravel or bedrock prevalent; some cobbles present	Riffles or runs virtually nonexistent; bedrock prevalent, cobbles lacking.
Score	**20 19 18 17 16**	**15 14 13 12 11**	**10 9 8 7 6**	**5 4 3 2 1 0**
3 Embedd-edness	Gravel, cobble and boulder particles are 0-25% surrounded by fine sediment	Gravel, cobble and boulder particles are 25-50% surrounded by fine sediment	Gravel, cobble and boulder particles are 50-75% surrounded by fine sediment	Gravel, cobble and boulder particles are >75% surrounded by fine sediment
Score	**20 19 18 17 16**	**15 14 13 12 11**	**10 9 8 7 6**	**5 4 3 2 1 0**
4. Channel alteration	Channelisation or dredging absent or minimal; stream with normal pattern	Some channelisation present, usually in areas of bridge abutments; evidence of past channelisation, ie, dredging (greater than past 20 yrs) may be present, but recent channelisation is not present.	Channelisation may be extensive; embankments or shoring structures present on both banks; and 40 – 80% of stream reach channelised and disrupted.	Banks shored with gabion or cement, over 80% of stream reach channelised 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**
5. Sediment deposition	Little or no enlargement of islands or point bars and less than 5% (<20% for low gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravels and/or fine sediment; 5-30% (20-50% for low gradient streams) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low gradient streams) of the bottom affected; sediment deposits at obstructions, constrictions and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low gradient streams) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
Score	**20 19 18 17 16**	**15 14 13 12 11**	**10 9 8 7 6**	**5 4 3 2 1 0**

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HIGH GRADIENT STREAMS

Habitat Parameter	Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Frequency of riffles and velocity-depth combin-ations:- slow/deep (<.3m/s,>.5m) slow/shallow fast/deep fast/shallow	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of stream <7:1 (generally 5 to 7); variety of habitat is the key; in streams where riffles are continuous, placement of boulders or other large, natural obstruction is important. All 4 velocity/depth patterns present.	Occurrence of riffles infrequent; ratio of distance between riffles divided by width of stream between 7 to 15. Only 3 of the 4 vel/depth patterns present.	Occasional riffle or bend bottom contours provide some habitat; distance between riffles divided by width of stream between 15 to 25. May be only 2 velocity depth patterns present; usually lacking deep areas.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by width of stream between >25. Dominated by one velocity/depth pattern.
Score	**20 19 18 17 16**	**15 14 13 12 11**	**10 9 8 7 6**	**5 4 3 2 1 0**
7 Channel flow status	Water reaches base of both lower banks, and minimal amount of channel substrate exposed.	Water fills >75% of available channel or <25% of channel substrate exposed	Water fills 25-75% of available channel and/or riffle substrates are mostly exposed	Very little water in channel and mostly present as standing pools.
Score	**20 19 18 17 16**	**15 14 13 12 11**	**10 9 8 7 6**	**5 4 3 2 1 0**
8. Bank vegetative protection (score each bank)	More than 90% of the streambank surfaces covered by native vegetation, including trees, understorey shrubs or non-woody macrophytes; vegetative disruption through grazing or mowing minimal or nor evident; almost all plants allowed to grow naturally	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well represented; disruption evident but not affecting full plant growth potential to any great extent	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank is very high; vegetation has been removed to 5 cm or less.
Score	**Left bank 10 9**	**8 7 6**	**5 4 3**	**2 1 0**
Score	**Right bank 10 9**	**8 7 6**	**5 4 3**	**2 1 0**
9. Bank stability (score each bank)	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent small areas of erosion mostly healed over; 5 –30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods	Unstable; many eroded areas; “raw” areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
Score	**Left bank 10 9**	**8 7 6**	**5 4 3**	**2 1 0**
Score	**Right bank 10 9**	**8 7 6**	**5 4 3**	**2 1 0**
10. Riparian Vegetative zone width (score each bank)	Width of riparian zone >18 m; human activities (ie roads, lawns, crops etc.) have not impacted zone.	Width of riparian zone 12-18 m; human activities have impacted zone only minimally.	Width of riparian zone 6-12 m; human activities have impacted zone a great deal.	Width of riparian zone <6 m; little or no riparian vegetation due to human activities.
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Total score_____

RIVER.....…….. **DATE**..... **LOCATION CODE**.....

LOW GRADIENT STREAMS

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Score	**20 19 18 17 16**	**15 14 13 12 11**	**10 9 8 7 6**	**5 4 3 2 1 0**
2. Pool substrate chararcterisation	Mixture of substrate materials with gravel and firms prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud or clay; mud may be dominant, some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
Score	**20 19 18 17 16**	**15 14 13 12 11**	**10 9 8 7 6**	**5 4 3 2 1 0**
3. Pool variability	Even mix of large/shallow, large/deep, small/shallow and small/deep pools present	Majority of pools large/deep; very few shallow	Shallow pools much more prevalent than deep pools	Majority of pools small/ shallow or pools absent
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LOW GRADIENT STREAMS

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6. Channel sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was a staright line. (Note: channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 2 to 3 times longer than if it was a staright line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was a staright line.	Channel straight; waterway has been channelised for a long distance.
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Total score_____