# SHMAK Data Sheet – General Information

| | | |
|---|---|---|
| **Site name:** | **Stream/river name**: | |
| **Site coordinates**: Northing/Longitude _____ Easting/Latitude: _____<br>**Site description -** *access, how to locate top and bottom of reach, etc.* | | |
| **Date**: | **Time started:** | **Time finished:** |
| **Names of monitoring team present**: | | |
| **Photopoint location marker** *Description*:<br>**Direction of photo:** Upstream ☐ Downstream ☐<br>**Frame (notes):** | | |
| **Weather now**:<br>☐ Storm (heavy rain)<br>☐ Rain (steady rain)<br>☐ Showers (intermittent rain)<br>☐ Overcast<br>☐ Clear/sunny | **Rainfall in past 48 hours**:<br>☐ Storm (heavy rain)<br>☐ Rain (steady rain)<br>☐ Intermittent showers | **Water level**:<br>☐ High<br>☐ Slightly raised<br>☐ Normal<br>☐ Low<br>**Streamflow ($m^3/s$):_____** |
| **Assessment notes –** *any unusual observations or changes since your last visit.* | | |
| **Length of reach (m):** | **River width (m):** | **Maximum depth (m):** |

| **Site Health Check** | *Circle all that apply* | | | | | |
|---|---|---|---|---|---|---|
| **Smell** | nothing unusual | sewage | petrol/ chemical | dead animals | rotting vegetation | musty |
| **Obstruction** | nothing unusual | weeds | wood | rubbish | built structure | |
| **Stream bed** | nothing unusual | artificial | mud/ sediment | slime | scum | |
| **Margin or bank** | nothing unusual | erosion | livestock access | pollution source | rubbish | no vegetation |
| **Appearance of the water** | nothing unusual | murky | muddy | colour | | |
| **Rate of flow** | | fast | slow | none | | |
| **Top water surface** | nothing unusual | oily film | foam | Slime/algae/ scum | | |

| |
|---|
| **Main land use in catchment (circle one)**<br>Exotic forest Native vegetation Crop Pasture Orchard Industrial Residential other _____ |
| **Other land use in catchment (circle one)**<br>Exotic forest Native vegetation Crop Pasture Orchard Industrial Residential other _____ |
| **Upstream catchment disturbances –** *note activities in the catchment that may impact the stream.* |

# SHMAK Data Sheet – Water Quality

**Temperature (°C)**:

**Conductivity (µS/cm):**

**Visual clarity (m)**: first measurement y1 = _____ m y2 = _____ m (y1 + y2)/2 = _____ m

second measurement y1 = _____ m y2 = _____ m (y1 + y2)/2 = _____ m

(y1 = distance where disc disappears, y2 = distance where disc reappears)

**Method**: **Clarity tube** ☐ **Black disc** ☐

**Nutrients**

**Nitrate-N: _____ mg/L** **Nitrate method**: **Aquaspex** ☐ **Lab** ☐ **Other** ☐

**Phosphate: _____mg/L** **Phosphate method: Hanna Checker** ☐ **Lab** ☐ **Other** ☐

**Phosphate-P*: ____mg/L**

*the Hanna Checker measures phosphate. To calculate phosphate-P, multiply phosphate by 0.326

***E. coli* method** **Petrifilm** ☐ **MC Media Plates** ☐ **Lab*** ☐ **Other** ☐

**If analysed by lab: Lab method:_____**

**Lab address:_____**

| Sample 1 | Sample 2 |
|---|---|
| Filtered: Yes ☐ If so, amount (mL) _____ | Filtered: Yes ☐ If so, amount (mL) _____ |
| Diluted: Yes ☐ If so, dilution ratio_____ | Diluted: Yes ☐ If so, dilution ratio_____ |
| Neither: Yes ☐ 1 mL | Neither: Yes ☐ 1 mL |
| No. *E. coli* (CFU on plate) _____ | No. *E. coli* (CFU on plate) _____ |
| No. *E. coli* (CFU per 100 mL) _____ | No. *E. coli* (CFU per 100 mL) _____ |

# SHMAK Data Sheet – Periphyton

**Habitat type (choose one):** Riffle ☐ Run ☐ **Main periphyton colour:** _____

| Stone/view | Filaments >2 cm long | Mats** | *Microcoleus* | Didymo | Moss |
|---|---|---|---|---|---|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |
| **Average %** | | | | | |

** Does not include *Microcoleus* or Didymo as these are recorded separately

***Microcoleus* assessment:**

**Reach length:** _____ m **Upstream end location:** _____ **Downstream end location:** _____

***Microcoleus* detached mats present**: Yes ☐ No ☐ ***Microcoleus* % cover of stream bed** _____

# SHMAK Data Sheet - Macrophytes

| | | Column | | | | | Band (or column averages) |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | |
| **Cross section 1** | Water surface (%) | | | | | | |
| | Volume occupied (%) | | | | | | |
| **Cross section 2** | Water surface (%) | | | | | | |
| | Volume occupied (%) | | | | | | |
| **Cross section 3** | Water surface (%) | | | | | | |
| | Volume occupied (%) | | | | | | |
| **Cross section 4** | Water surface (%) | | | | | | |
| | Volume occupied (%) | | | | | | |
| **Cross section 5** | Water surface (%) | | | | | | |
| | Volume occupied (%) | | | | | | |
| **Average water surface (%):** | | **Average volume occupied (%):** | | | | | |

# SHMAK Data Sheet – Benthic Macroinvertebrates

**Stream bed:** Stony-bottom ☐ Muddy/sandy-bottom ☐

**Sampling method:** Stone method ☐ Kick net method: Riffle only ☐ Kick net method: All-habitat ☐

| **(All-habitat method) Range of habitat types:** | % present in study area | No. of jabs with net |
|---|---|---|
| Aquatic plants | | |
| Vegetated banks | | |
| Roots/large wood | | |

*R= rare (1-4 animals), C = common (5-19 animals), A = abundant (20 or more animals)

| | | If present, record R, C or A* | tolerance score | Copy tolerance score if present |
|---|---|---|---|---|
| Mayflies | Flat mayfly | | 8 | |
| | Spiny-gilled mayfly | | 9 | |
| | Swimming mayfly | | 9 | |
| | Tusked mayfly | | 8 | |
| Stoneflies | Green stonefly | | 10 | |
| | Other stonefly | | 8 | |
| Caddisflies | Free-living caddisfly | | 6 | |
| | Net-spinning caddisfly | | 6 | |
| | Messy-net caddisfly | | 8 | |
| | Stick-cased caddisfly | | 6 | |
| | Stony-cased caddisfly | | 6 | |
| | Smooth-cased caddisfly | | 9 | |
| | Spiral-cased caddisfly | | 10 | |
| | Micro-caddisfly | | 3 | |
| Other insects | Dobsonfly | | 7 | |
| | Dragonfly | | 6 | |
| | Damselfly | | 5 | |
| | Beetle | | 6 | |
| | Water boatman/ backswimmer | | 5 | |
| | Water treader | | 5 | |
| True Flies | Crane fly | | 5 | |
| | Sand fly | | 3 | |
| | Mosquito | | 3 | |
| | Midge | | 2 | |
| | Other fly larva | | 3 | |
| Spider-like | Dolomedes spider | | 5 | |
| | Mite | | 5 | |
| Crustaceans | Crayfish/koura | | 5 | |
| | Amphipod | | 5 | |
| | Isopod | | 5 | |
| | Seed shrimp | | 3 | |
| | Water flea | | 5 | |
| | Shrimp | | 5 | |
| Molluscs | Limpet | | 3 | |
| | Mussel/kakahi | | 6 | |
| | Fingernail clam | | 3 | |
| | Flat spiral snail | | 3 | |
| | Mud snail | | 4 | |
| | Left-hand snail | | 3 | |
| Worms | Leech | | 3 | |
| | Segmented worm | | 1 | |
| | Flatworm | | 3 | |
| | TOTAL | | | |

# SHMAK Data Sheet -Physical Habitat Visual Assessment

| Excellent | Good | Fair | Poor |
|---|---|---|---|
| **1. Amount of deposited fine sediment** | | | |
| **a) stony-bottomed streams** | | | |
| <10% of the stream bed in run habitats covered by sand or silt | 10-20% of stream bed in run habitats covered by sand or silt. | 20-50% of stream bed in run habitats is covered by sand or silt, score lower if deposits are >1cm deep | >50% of the stream bed in run habitats is covered by sand or silt, score lower if deposits are >1cm deep |
| **b) soft-bottomed streams** | | | |
| Sediment deposits in pools <1 cm deep | Sediment depth is up to 10% of max pool depth | Sediment depth is 10-30% of max pool depth | Sediment depth is >30% of max pool depth |
| 8 7 | 6 5 | 4 3 | 2 1 0 |
| | | | |
| **2. Habitat for aquatic animals** | | | |
| **Circle all habit features that are present:** | | | |
| Large wood root mats undercut banks overhanging vegetation macrophytes boulders cobble | | | |
| **Abundant and diverse**<br>At least 4 of these habitat features present<br>AND<br>Large particles (cobbles, wood, roots) cover >75% of stream bed | **Adequate**<br>3 of these habitat features present<br>AND<br>Large particles cover at least 50% of stream bed | **Patchy and limited**<br>2 of these habitat features present<br>AND<br>Large particles cover at least 25% of stream bed | **Rare or absent**<br>One or none of these features present<br>AND<br>Large particles cover <25% of stream bed |
| 8 7 | 6 5 | 4 3 | 2 1 0 |
| | | | |
| **3. Flow types** | | | |
| **Circle all flow types present:** | | | |
| pool | riffle | run | chute/waterfall |
| All least 3 of these flow types are present<br>AND<br>Variety of pool sizes and depths | 3 flow types present but riffle habitat is scarce<br>AND<br>Some deep pools | Only 2 flow types present<br>AND<br>Deep pools absent | Only 1 flow type present<br>AND<br>Pools absent (includes uniformly deep streams) |
| 8 7 | 6 5 | 4 3 | 2 1 0 |
| | | | |
| **4. Bank stability and erosion - rate each bank separately** | | | |
| **High**<br>Banks have very stable rock/soil type and/or dense vegetation cover AND <5% of bank length eroded by scouring or trampling | **Moderate**<br>Banks have fairly stable soil type and/or moderate vegetation cover and/or root depth AND 5-30% of bank length eroded by scouring or trampling | **Low**<br>Banks have somewhat unstable (crumbly) soil and/or sparse vegetation cover and/or shallow roots AND 30-60% of bank length eroded by slumping or trampling | **Very low**<br>Banks have very unstable soil and little/no vegetation and few roots AND >60% of banks length eroded by slumping or trampling |
| **Left Bank** | | | |
| 4 | 3 | 2 | 1 |
| **Right bank** | | | |
| 4 | 3 | 2 | 1 |
| | | | |

| Excellent | Good | Fair | Poor |
|---|---|---|---|
| **5. Bank vegetation (up to 10 m from stream) – rate each bank separately** | | | |
| Mature native vegetation with intact understorey and ground cover | Regenerating native bush or mature with damaged understorey or mature exotic trees, flaxes, sedges | Shrubs or sparse tree cover with little understorey vegetation or long grasses or early-stage trees | Heavily grazed/mown grass or bare ground or impervious artificial surfaces |
| **Left bank** | | | |
| 4 | 3 | 2 | 1 |
| **Right bank** | | | |
| 4 | 3 | 2 | 1 |
| | | | |
| **6. Riparian buffer width and intactness** | | | |
| Continuous trees/shrubs along stream and no livestock access to stream AND wide (>10 m) buffer width | Trees/shrubs mostly continuous and livestock access limited AND moderate (5-10 m) buffer width | Fence only or patchy trees/shrubs with grazed/mown grass AND narrow (<5 m wide) buffer width | Few/no trees/shrubs and unlimited livestock access or obvious human impact AND absent or infrequent buffer width |
| **Left bank** | | | |
| 4 | 3 | 2 | 1 |
| **Right bank** | | | |
| 4 | 3 | 2 | 1 |
| | | | |
| **7. Shade** | | | |
| High shading (>70%) across stream | Moderate shade (40-70%) of water surface | Minimal shade (10-40%) of water surface | Little or no shading (<10%) of water surface |
| 8 7 | 6 5 | 4 3 | 2 1 0 |
| | | | |
| **8. Channel alteration** | | | |
| Natural stream bed and unmodified bank form OR Stream with natural channel profile and meander | Natural stream bed, some evidence of bank stabilisation (e.g. near bridges). No embankments or man-made structures in stream OR <20% of channel straightened | Significant proportion or stream bed or banks stabilised by man-made material OR embankments keep floodwaters within the channel OR 20-50% of channel straightened | Stream bed or banks stabilised over most of their length by man-made materials OR stream flow altered by instream structures (weirs, culverts) OR >50% of channel length straightened |
| 8 7 | 6 5 | 4 3 | 2 1 0 |
| **TOTAL SCORE =** | | | |
| **How to interpret your score** | | | |
| **Excellent >55** | **Good 40-55** | **Fair 24-39** | **Poor <24** |

## Streambed Composition – Wolman Walk or Visual Assessment

| | Example | Number of particles | % stream bed |
|---|---|---|---|
| Bedrock | III | | |
| Boulders (>25 cm) | IIIII II | | |
| Large cobbles (12-25 cm) | IIIII IIIII IIIII | | |
| Small cobbles (6-12 cm) | IIIII IIIII IIIII | | |
| Large gravel (1.6-6 cm) | IIIII | | |
| Small gravel (2-16 mm) | IIIII IIIII | | |
| Sand/silt/mud (<2mm) | IIIII IIIII IIIII II | | |
| Man-made | III | | |
| Large wood (>5 cm diameter | | | |
| Small wood (<5cm diameter) | III | | |
| Water plants (rooted) | | | |
| **TOTAL** | 75 | | |

# SHMAK Data Sheet – Rubbish/Litter Level 1

| | Excellent | Good | Fair | Poor |
|---|---|---|---|---|
| **Amount of rubbish** | On first glance, no rubbish visible; after close inspection little or no rubbish evident. | On first glance, little or no rubbish visible; after close inspection small amounts of rubbish evident. | Rubbish is evident in low to medium amounts on first glance. Streambank contains litter. | Rubbish distracts the eye on first glance. Substantial litter in stream and along bank. |
| **Score** | 8 7 | 6 5 | 4 3 | 2 1 |
| **Threat to aquatic life** | Rubbish, if any, mostly paper or wood products or other biodegradable materials. | Little or no persistent or buoyant rubbish or small items. Rubbish is mainly degradable, settleable or non-toxic, e.g. wood, glass, or metal. | Medium amount of persistent (e.g. plastic, rubber), toxic (e.g. cigarette butts), or buoyant (e.g. bags) items; or large deposits of settleable rubbish such as glass or metal. | Large amount of persistent (e.g. plastic, rubber), toxic (e.g. cigarette butts), buoyant (e.g. Styrofoam), or small rubbish items |
| | 8 7 | 6 5 | 4 3 | 2 1 |
| **Threat to human health** | No bacterial/viral hazards (medical waste, diapers, pet/human waste), no toxic substances (batteries, chemicals), no puncture or laceration hazards. | No medical waste or sources of toxic substances, but some puncture or laceration hazards (e.g. broken glass, metal debris). | Presence of **one** of the following: needles or medical waste; diapers or pet waste; toxic substances such as batteries or chemicals. | Presence of **more than one** of the following: needles or medical waste; diapers or pet waste; toxic substances such as batteries or chemicals. |
| | 8 7 | 6 5 | 4 3 | 2 1 |
| **Dumping and littering** | Any observed rubbish is incidental litter (less than 5 items) or carried downstream from another location. | Some evidence of instream or shoreline littering; and/or evidence of dumping of material. Material dumped is paper-based debris (e.g., fast food). | Prevalent instream or shoreline littering; and/or the presence of **one** large item (e.g., furniture, appliance, rubbish bag). | Significant littering; and/or evidence of repeated dumping, with **more than one** large item (e.g., furniture, shopping trolley, bags of rubbish). |
| | 8 7 | 6 5 | 4 3 | 2 1 |
| **Accumulation of rubbish from upstream** | Rubbish, if any, appears to have been directly deposited on the stream bed (no evidence of transport from upstream). | Less than 10 rubbish items. Items appear to be transported from upstream (based on evidence such as silt marks, faded colours or near high water mark). | 10-50 items of rubbish items appear to be carried to the location from upstream, as evidence from location near high water mark or siltation marks. | Substantial quantities of rubbish (>50 items) appear to be carried from upstream and has accumulated at the site. |
| | 8 7 | 6 5 | 4 3 | 2 1 |
| **Total Score = / 40** | | | | |

# SHMAK Data Sheet – Rubbish/Litter Level 2

| **General Information** | | |
|---|---|---|
| GPS coordinates (upstream): | | GPS coordinates (downstream): |
| Clean up start time: | Clean up finishing time: | No. of participants: |
| **Sampling area (check all that apply) and measurements (in meters)** | | |
| ☐ Left bank (facing downstream) | ☐ Right bank (facing downstream) | ☐ In stream |
| Site length (A):_____Width right bank (B): _____Width left bank (C): _____Avg stream width (D):_____ | | |
| Total bank area = (A X B) + (A X C):_____ | Total stream area = (A X D): _____ | |
| **Audit information (identifying the litter)** | | |
| Audit start time: | Audit finish time: | No. of participants |
| Did you take photos ☐ Yes ☐ No | | |
| **Notes about the assessment** | | |

The **Confidence column (H = high/L=low)** refers to how confidence you are in the weight of the items you measure. If the items are wet or covered in dirt, the weight won't be accurate.

| | In Stream | | | On Stream Bank | | | |
|---|---|---|---|---|---|---|---|
| **Material Category** | **Count** | **Weight** | **H/L** | **Count** | **Weight** | **H/L** | **Notes** |
| **CLOTH** | | | | | | | |
| Backpacks and bags | | | | | | | |
| Canvas cloth | | | | | | | |
| Carpet and furnishing | | | | | | | |
| Clothing (incl hats, towels) | | | | | | | |
| Footwear (exc. jandles) | | | | | | | |
| Natural rope | | | | | | | |
| Other cloth (incl. rags) | | | | | | | |
| **PLASTIC** | | | | | | | |
| Material Category | | | | | | | |
| PLASTIC | | | | | | | |
| Baskets, crates, trays | | | | | | | |
| Bottle caps, lids, neck rings, tabs | | | | | | | |
| Bottles (≤ 2 L) | | | | | | | |
| Bottles, buckets (> 2 L) | | | | | | | |
| Cable ties & zip ties | | | | | | | |
| Cigarette lighters | | | | | | | |
| Cigarettes, butts & filters | | | | | | | |
| Clothes pegs | | | | | | | |
| Construction & safety related | | | | | | | |
| Drink package rings | | | | | | | |
| Fiberglass fragments | | | | | | | |
| Fishing items | | | | | | | |
| Food containers and cups | | | | | | | |
| Food wrappers | | | | | | | |
| Gardening & farming | | | | | | | |
| Gloves | | | | | | | |
| Lollipop sticks, cotton buds | | | | | | | |
| Medical & cosmetic waste | | | | | | | |
| Mesh bags | | | | | | | |
| Miscellaneous soft plastic | | | | | | | |
| Parking tickets and receipts | | | | | | | |
| Pens, plastic pencils | | | | | | | |
| Plastic bags | | | | | | | |
| Plastic sheeting (incl tarps) | | | | | | | |
| Plastic utensils | | | | | | | |
| Plastic vehicle parts | | | | | | | |
| Rope | | | | | | | |
| Shotgun wadding & shells | | | | | | | |
| Strapping bands & tape | | | | | | | |
| Straws | | | | | | | |
| Syringes | | | | | | | ***biohazard*** |
| Toys & sports | | | | | | | |
| Unidentifiable hard fragments | | | | | | | |
| Other plastic | | | | | | | |
| **FOAM PLASTIC** | | | | | | | |
| Ear plugs | | | | | | | |
| Foam buoys | | | | | | | |
| Foam spacers | | | | | | | |
| Foam sponge | | | | | | | |
| Polystyrene cups, food packs | | | | | | | |
| Polystyrene insulation | | | | | | | |
| Unidentifiable foam fragments | | | | | | | |

| | In Stream | | | On Stream Bank | | | Notes |
|---|---|---|---|---|---|---|---|
| **Material Category** | **Count** | **Weight** | **H/L** | **Count** | **Weight** | **H/L** | |
| Other foamed plastic | | | | | | | |
| **RUBBER** | | | | | | | |
| Balloons, toys, balls | | | | | | | |
| Condoms | | | | | | | |
| Glovers | | | | | | | |
| Inner-tubes | | | | | | | |
| Rubber bands | | | | | | | |
| Rubber footwear | | | | | | | |
| Tyres | | | | | | | |
| Unidentifiable rubber fragments | | | | | | | |
| Other rubber | | | | | | | |
| Bottles & jars | | | | | | | |
| Construction (bricks, pipes) | | | | | | | |
| Fluorescent light bulbs | | | | | | | |
| Glass fragments ! | | | | | | | ***sharp*** |
| Light globes/bulbs | | | | | | | |
| Tableware (plates, cups) | | | | | | | |
| Other glass | | | | | | | |
| Corks | | | | | | | |
| Matches, fireworks | | | | | | | |
| Processed wood | | | | | | | |
| Wooden utensils | | | | | | | |
| Other wood | | | | | | | |
| Aluminium drink cans | | | | | | | |
| **METAL** | | | | | | | |
| Bottle caps, lids, tabs | | | | | | | |
| Fishing related | | | | | | | |
| Foil wrappers | | | | | | | |
| Gas bottles and drums (>4L) | | | | | | | |
| Metal vehicle parts | | | | | | | |
| Other cans (≤4L) | | | | | | | |
| Sharps, needles, lancets ⛔ | | | | | | | ***biohazard*** |
| Shopping trolley | | | | | | | |
| Tableware | | | | | | | |
| Wire, barb wire, nails ! | | | | | | | ***sharp*** |
| Unidentifiable metal fragment | | | | | | | |
| Other metal | | | | | | | |
| **PAPER & CARDBOARD** | | | | | | | |
| Cardboard boxes & fragments | | | | | | | |
| Cups, food trays, wrappers | | | | | | | |
| Fireworks, matches | | | | | | | |
| Paper (incl magazines) | | | | | | | |
| Other paper | | | | | | | |
| **OTHER** | | | | | | | |
| Appliances and electronics | | | | | | | |
| Batteries (household) | | | | | | | |
| Batteries (non-household) | | | | | | | |
| Boat parts | | | | | | | |
| Faeces (pet waste in bags) ⛔ | | | | | | | ***biohazard*** |
| Paraffin or wax | | | | | | | |
| Sanitary (plasters, nappies) ⛔ | | | | | | | ***biohazard*** |
| Other | | | | | | | |