River Guardians Monitoring Survey Form Guide

Survey Details

It is important to know where you are! Make sure you have a national grid reference (NGR) a stream/river name and location (e.g. River Rother at Fittleworth) which stays the same every time you survey at that point. Take advantage of the 'copy survey' button at the top of your old survey in Cartographer to save you inputting the same information every time.

Type of waterbody (tick one)

There is no clear definition between a river and a stream, or lake and pond, except that rivers and lakes are the larger of the two! Unless otherwise known, use your best judgement or that of Ordnance Survey/mobile maps.

Pictures

It's great to have pictures to illustrate your survey. One of them can be a fixed-point photograph (similar location and angle every survey). The other pictures could be of unusual or unknown qualities, pollution, or wildlife. If you do see something you are not sure of, whether that be physical or biological, please let us know and we can help you identify it.

General Ecosystem Observations

Dominant land use within ~50m

You can select multiple land uses if it is different on each bank.

Woodland

Moorland/ heath

Urban/Residential

Industry/Commercial

Parkland/Garden

Grassland/pasture

Agriculture (crops)

Tilled land (ploughed field)

Dominant bankside vegetation - You can check multiple types. If not on this list, check 'other' and write a note

Trees/ shrubs

Mixed plants/ flowers

Grass

None (Impermeable Surface)

None (bare earth)

Wildlife Spotted

These are just some of the potential wildlife you could spot along your watercourse. You can check multiple species. If you see anything not on the list, please select 'other' and write a note.

Otter

Water Vole

Kingfisher

Grey Wagtail

Heron

Fish

Duck

Dragonflies/ Damselflies

Moorhen/Coot

Geese

Swan

Problem plant species

You can check multiple species. If not on this list, check ‘other’ and write a note

Himalayan balsam

Japanese knotweed

Giant hogweed

Curly waterweed

Skunk cabbage

Floating Pennywort

Pictures courtesy of GB Non-Native Species Secretariat

Evidence of Pollution

Pollution sources

Please only tick if you can see pollution at the time of the survey. If you see anything not on the list, please select 'other' and write a note.

Outfall discharging

Outfall not discharging

Outfall causing odour

Outfall causing discolouration

Collapsed river banks

Cattle/stock access to river

Grey water/misconnection

Soil run-off

Road run-off

Farm run-off (slurry/silage)

The pictures represent the more obvious depiction of these pollution sources. You may see evidence that is less clear. Please take a picture and use the notes section at the end of the form if you are unsure of anything you see.

Evidence of recent pollution

You may not witness pollution running into the river directly, but generally it does leave behind evidence which can be noted in this section.

Sewage fungus

Litter/fly-tipping

Unpleasant odour

Oily sheen

Foam (white/fragrant)

Smothering algae

Sewage-related litter

River Channel Observations

Channel dimensions:

Estimating the width and depth of your watercourse can be done by eye (this is the safe option particularly if it is wide and/or fast flowing).
To get an accurate depth measurement, divide the channel into thirds and take an estimated measurement from each section which you can then average for the whole channel. Channel dimensions and flow help us to contextualize the water quality results.

Predominant substrate

Tick one that dominates the waterbody bed. If you can't see the bottom, tick not visible.

Boulders (>25cm football size)

Stones (25cm - 6cm Tennis ball size)

Gravel (4mm - 6cm)

Sand (Up to 2mm)

Silt/mud - (Identify by eye looks like mud not sand)

Artificial

Channel Vegetation

Can you spot aquatic vegetation submerged/emerging from the river channel?

Flow Conditions

The more surveys you do, the better you will get to know your watercourse and its different flow conditions. You can estimate flow by walking alongside the watercourse checking to see if it is running faster, slower or at the same speed as your walk. Here are examples of larger rivers in different states, it may be very different conditions at your site.

Surging

Steady

Slow

Still

Water level Estimate

Once again, the more surveys you do on your watercourse the better you will understand the different levels. Have a look at the debris line to get an idea of how high the river/stream gets too.

Obstacles to fish or flow

These should be noted if they are within 50m of the sample site.

Weir

Fallen or Submerged Tree

Debris Dam

Bridge/Culvert

Water quality readings

Temperature

Temperature is a vital indicator within the river ecosystem. It controls many of the aquatic species life cycles. Temperature changes with the seasons, however, climate change is impacting river temperature, and we need to know how it's affecting river life.

Total Dissolved Solids (TDS)

TDS are the amount of organic and inorganic materials, such as metals, minerals, salts, and ions, dissolved in a particular volume of water. Harmful pollution from things like sewage, slurry and factory discharge will usually elevate the TDS reading. Regular monitoring will detect changes in TDS which can indicate pollution.

Low levels of dissolved solids near the source of the river, are a result of very low levels of input from the surrounding landscape. As the river runs down to the sea it collects material from many different inputs, some natural and some man-made such as farms, sewage plants, factories, and residential areas. This typically increases the amount of solids dissolved in the water leading to a higher reading. Harmful pollution from things like sewage, slurry and factory discharge will usually elevate your TDS reading. Surrounding geology will influence the normal level of TDS in a watercourse (e.g. Areas dominated by granite generally give a lower TDS reading than those with limestone/chalk). Regular monitoring will allow the detection of changes in total dissolved solids/conductivity which can indicate pollution.

The TDS meter measures both temperature and dissolved solids. Ensure you are measuring in ppm and °C. This can be changed by pressing the shift button until it matches up. Hold the meter in your sample (ensuring the water does not go above the lid line, it is not completely waterproof) until it has stabilised, then copy the readings onto the form. You can use the hold button if you are struggling to read off the meter and keep it in the water.

Phosphate

Phosphate found in rivers comes from a variety of sources, including agricultural run-off and wastewater discharges. Phosphate is an essential nutrient, but high concentrations in rivers can cause serious damage to aquatic ecosystems.

How to take a Phosphate reading using a Hanna Checker:

1. Turn the meter on by pressing the button. When the display shows “Add”, “C.1” with “Press” blinking, the meter is ready.
2. Fill the cuvette/test tube with 10ml of unreacted sample and replace the cap. Place the cuvette into the meter and close the meter’s cap.
3. Press the button. When the display shows “Add”, “C.2” with “Press” blinking the meter is zeroed/calibrated.
4. Remove the cuvette from the meter and unscrew the cap. Add the content of one packet of HI713-0 reagent. Replace the cap and shake gently for 2 minutes until the powder is completely dissolved. Place the cuvette back into the meter.
5. Press and **hold** the button until the timer is displayed on the LCD (the display will show the countdown prior to the measurement) or, alternatively, wait for 3 minutes and press the button.
6. • The instrument directly displays the concentration of phosphate in parts per million (ppm). Note this reading down on your survey form, notebook or into your Cartographer survey app. The meter automatically turns off after 2 minutes.

Top Tips:

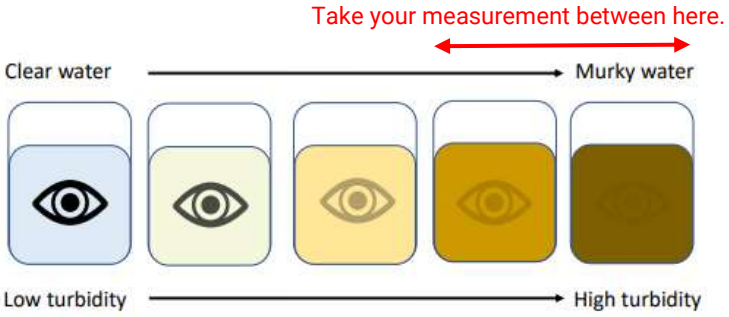
- Cut the dotted line of the reagent sachet with scissors for an easier/less fiddly pour.
- Wipe the outside of the cuvette/test tube with a rag/cloth to remove excess water or fingerprints, which could alter the results.
- Rinse out the cuvette 2 or 3 times with site water before taking a measurement to flush out any residual water from your previous sample.
- Phosphate Reagent Disposal -For best practice it is advice to **pour the contents into a paper towel/tissue and dispose of this in a general waste bin** (this can be done on site or at home. We advise to bring a small ziploc or similar for when out testing).

Turbidity

Turbidity is a measure of water clarity – how clear the water is. Water can become more turbid (murky) when there are a lot of particles suspended in it, for example from soil washing into the rivers, or dirt washing off roads during rainfall. These particles can cause problems in the river, e.g. smothering the gravels on the riverbed which fish need to lay eggs. Turbidity is of specific importance within our catchment as the Rother is regarded as the most erodible catchment in the UK.

You will often find your waterbody gets more turbid after heavy rainfall due to soil running off fields and sediment being mixed into the water column. This loss of topsoil is both a problem for farmer and river. It can often contain chemicals from fertiliser and pesticides used on the land. An increase in sediment level on the bed of the river can cause smothering of habitat by removing light and oxygen.

- Fill the turbidity tube (slowly to avoid bubbles) until you can no longer see the black cross on the yellow disc at the bottom of the tube.
- Read off the number from the side of the tube. That will give you your turbidity in JTU (Jackson Turbidity Units). If it is clear to the top enter the value as 5JTU.
- Turbidity readings between 0-10JTU are considered normal.



Nitrates

Nitrates are chemicals which dissolve in water. If there is too much nitrate in a waterbody it will cause a growth in green algae as it uses up the excess nutrients. This algae in the water reduces the amount of sunlight reaching aquatic plants and stops their growth. An increase in nitrate levels can be caused by a variety of reasons, such as fertiliser runoff from farmland or by raw sewage entering the water.

- Remove a Nitrate strip from the tub, making sure not to get any other strips wet or allow moisture into the tube.
- Dip the two pads of the Nitrate strip into your water bucket for 1 second (no need to submerge your fingers).
- Remove strip from water and wait 30 seconds (no need to shake off excess water from test strip).
- Compare Nitrate tab with colour chart on tub.

Western Sussex Rivers Trust

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