

Your guide to...

# NUTRIENT TESTING

View the full toolkit at [kit.riveractionuk.com](http://kit.riveractionuk.com)

**This short guide provides resources and guidance on why it's important to test for nutrients, specifically looking at phosphates and nitrates, and what methods are available to you.**

## WHAT ARE PHOSPHATES AND NITRATES?

Phosphates and nitrates are important nutrients in rivers, used by plants and wildlife to build proteins and photosynthesize. However, in large amounts, these nutrients have detrimental effects on water quality and ecosystem health.

High nutrient levels promote the overgrowth of algae, stimulating the harmful process of eutrophication. In this process, vast algal blooms emerge which thrive in the high-nutrient conditions. By using up all the available oxygen and blocking out sunlight, algal blooms choke the other flora and fauna in the river and produce toxins. Consequently, these nutrients can be a threat to entire river ecosystems.

## WHY IS IT IMPORTANT TO TEST FOR THEM?

Phosphate and nitrate are found in agricultural fertiliser, animal waste, and sewage. Fertiliser run-off and leaking sewage pipes mean that dangerously high nutrient levels are an increasing occurrence across British rivers and waterways.

Identifying the presence of high phosphate and nitrate levels is an essential start to preventing their catastrophic effects on rivers, allowing us to locate sources of pollution.

## WHAT DIFFERENT TESTING METHODS ARE THERE?

Groups or individuals that are looking to do consistent reliable testing, without guidance, but at a lower price, can purchase their own test kits. It's easy to learn, affordable, and can be conducted on-site at a river bank along your local river.

### Hanna phosphate checkers

The Hanna phosphate checker is a portable device that employs light technology to assess phosphate levels in river water. To use it, you fill its inner removable tube with river water and add a powdered reactive agent. This sample is then inserted into the pocket checker and left for three minutes. After three minutes, the gadget displays a number on the screen, telling you the phosphate level in your water supply.



You can purchase a Hanna Phosphate Checker [here](#) for £86.40. For guidance on how to use it, you can watch [this video made by the Friends of the Upper Wye](#), who clearly explain the testing process.

### Hach test strips

Phosphate and nitrate test strips are thin papers used to measure these substances in river water and are cheap to buy. We recommend using Hach nitrate test strips. They cost £35.60 for two boxes, which should last a year.

To perform the test, first collect water from the river using a beaker and then briefly dip the strip's pads in the water sample. Following instructions on the test packet, wait for a short time for colour changes in the strip. Compare the final colour to the test chart to identify the nutrient level in the water.

You can find more information about the Hanna checker and test strips through the [Angling Trust's Water Monitoring Network page](#). Friends of the Upper Wye have also created [a video to explain how to use the test strips](#).



### What else will I need?

There are a few other bits of basic kit which come in handy when taking water quality samples:

- ✔ **Turbidity Tube**
- ✔ **Syringe**
- ✔ **Safety gear (gloves and safety glasses)**
- ✔ **A vessel for taking water samples**

These can range from homemade to £200 steel beakers. We recommend just cutting open an old milk bottle, and attaching it to a bamboo stick.

You can often find these tests bundled in kits, such as the **Freshwater Explorer Testkit** from WaterRangers. You can also **purchase test equipment individually**. Local Rivers Trusts and established citizen scientist groups offer similar kits to people in the local area, such as the **Water Quality Kit from the Westcountry Rivers Trust**.

## TESTING NETWORKS AND MEMBERSHIPS

Alternatively, larger groups who want to do consistent testing with access to guidance, support and testing equipment might want to consider becoming a member of **Earthwatch's freshwater watch**.

The membership typically ranges from £400-£900. It includes access to their nationwide database, and a testing kit for checking nutrient levels. For guidance on how to use the testing kit, watch this video.



Photo credits: Earthwatch

Anglers who want to get involved in testing water quality should consider becoming a member of the Angling Trust, to join their **Water Quality Monitoring Network** and get access to discounted test kits and their database. If you are an angler, membership to Angling Trust costs £26 per year and their kit is reduced to £209. Alternatively, smaller groups could get in touch with their local angling club, who may support your involvement in testing a local river. To find your local angling club check their **map**.

## WHAT LEVELS OF PHOSPHATE AND NITRATES SHOULD BE IN MY RIVER?

Healthy standards of phosphate and nitrate levels vary on a case by case basis, based on factors like altitude, alkalinity, and river type. These standards are calculated by the Environment Agency (EA) and Natural Resources Wales and depend upon the specific characteristics of each site.

For phosphates (P-PO<sub>4</sub>), the maximum concentration for ecologically healthy rivers in the UK is generally accepted to be 0.101 mg/L.

For nitrates (N-NO<sub>3</sub>), the maximum concentration for ecologically health rivers in the UK is generally accepted to be 1.0 mg/L

Exceeding these levels may indicate some form of contamination and raise concerns about water quality.

Given the degree of variation, it can be difficult to put a precise number on the level of nitrates and phosphates that indicate a healthy river. It is important to keep testing, and as you identify patterns in your testing, a more comprehensive understanding of the river will emerge. Defra's Nitrate and phosphate indicator sheet, and the Water Quality Monitoring Network Annual Report of the Angling trust are useful references for comparing your findings to.