A clear solution for farmers
ENGLAND CATCHMENT SENSITIVE FARMING DELIVERY INITIATIVE

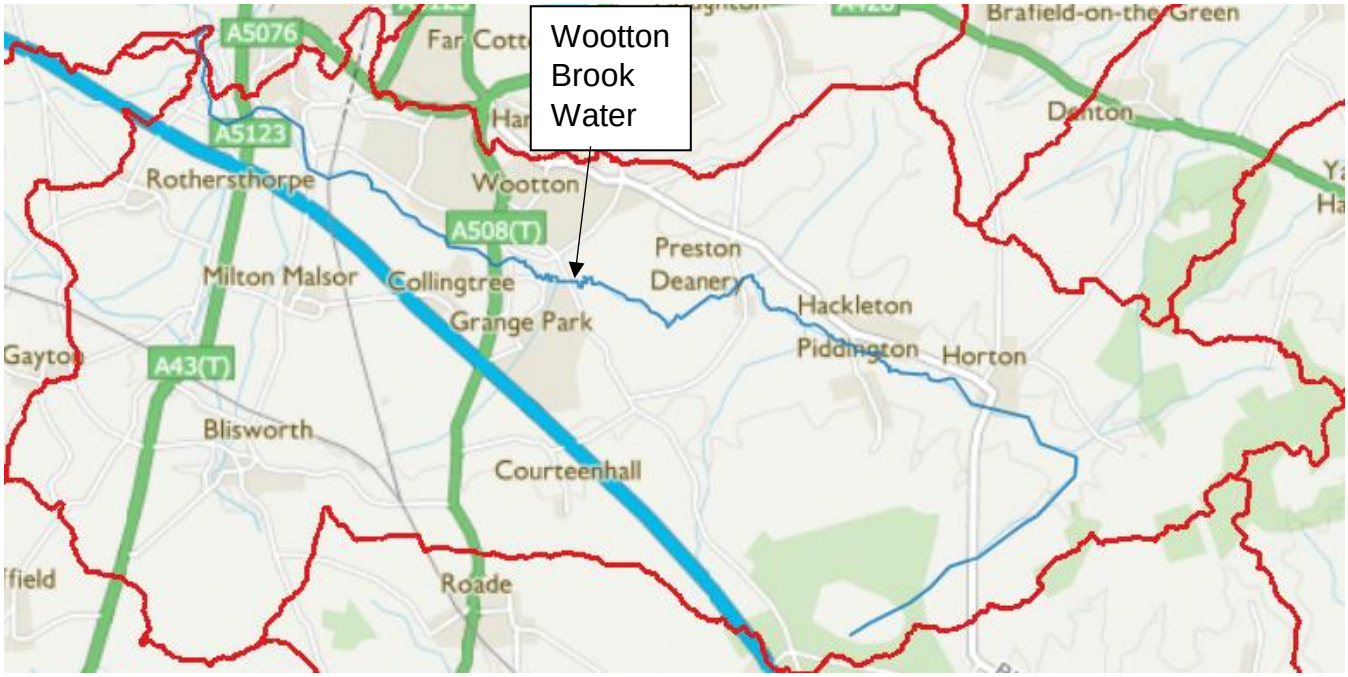
Nene Catchment Partnership - Your Water Catchment

River Nene

Wootton Brook

GB105032045550

The Wootton Brook is a tributary of the upper end of the Nene and is displayed on the map shown below. This bulletin provides a summary of the available water quality data for the catchment, and some of the key environmental features and issues.



The catchment

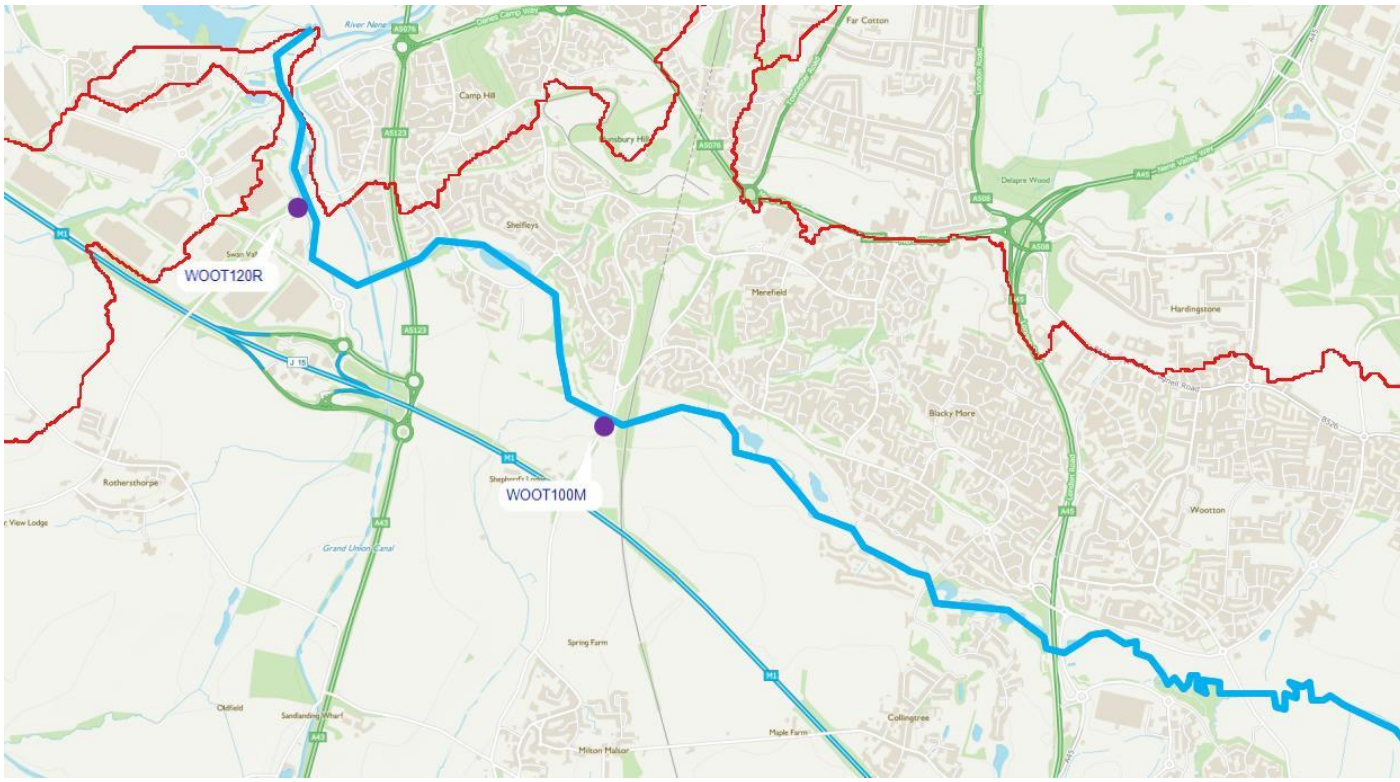
This bulletin focuses on the Wootton Brook, its WFD status and how Catchment Sensitive Farming (CSF) can help maintain and improve the water quality within the catchment.

The Wootton Brook is located to the north of the village of Milton Malsor in north Northamptonshire. It runs west from Grange Park and joins up with the Nene.

The Wootton Brook flows through predominantly residential housing and rural areas until it reaches the Nene where is mainly urban in its surroundings.

Current WFD Status

The Wootton Brook is currently classified as "**moderate**" in its status by the **Water Framework Directive (WFD).** The WFD requires that all waterbodies meet Good Ecological Status/Potential by 2027, and the Nene Catchment Partnership is working with the Environment Agency to achieve this. The Environment Agency has two permanent sampling points, (WOOT120R and WOOT100M), that are relevant to the Wootton Brook. There is monitoring data for this catchment dating back from 1981 up until 2019. The sampling points are located at Banbury lane and Towcester Road. The Map below shows locations of the Environment Agency monitoring points for this catchment.

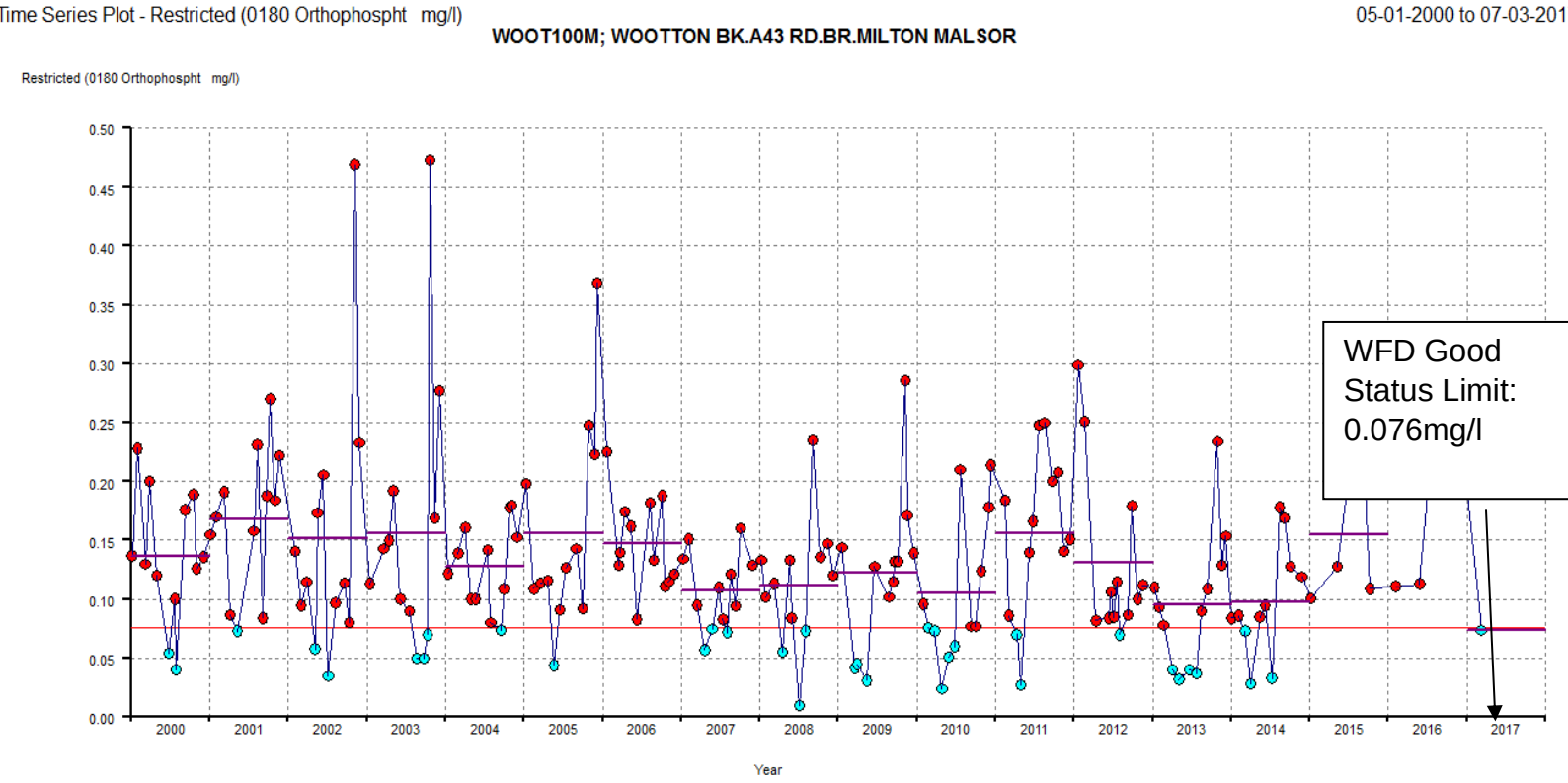


Phosphates

Phosphate is the most common failing element nationally under WFD. Phosphate pollution may originate from point sources, such as sewage treatment works (STWs) and septic tanks, or from diffuse sources. By diffuse sources we mean from a range of activities and scattered sources that individually may have no effect on the water environment, but added together when they enter a water body can have a significant effect on the water quality. All

catchments are different, but as a general rule it is thought that, in rural catchments, agriculture inputs about 35% of phosphate into the water and STWs about 60%.

The WFD target for 'good status' in this catchment for phosphate is 0.076mg/l. The graph below shows the annual average phosphate levels in purple and the WFD target is the red line. The red dots represents data that fails the good status limit.



Between 2015 and 2017, the annual average was 0.160mg/l, which would be classified as 'moderate' under the WFD. This indicates that there is still some effort to be had to get this catchment up to a WFD status of "Good".

The overall 'moderate' classification of this catchment relates to microscopic plants present in the waterbody called Phytobenthos. These plants are good indicators of nutrient enrichment and other pollution. As a plant nutrient, the elevated phosphate levels in the catchment are directly linked to the levels of Phytobenthos.

A study by the Environment Agency in 2011 suggested that discharges from Sewage Treatments Works are the main source of phosphates in the catchment. The impact of diffuse pollution was not measured, but should not be ruled out.

As this catchment is predominantly rural, there is potential for phosphates to enter the catchment from agricultural run-off containing phosphate bound to sediments.

Approximately 95% of the agricultural land in the catchment is in either an Entry or Higher Level Environmental Stewardship Scheme. These schemes are designed to protect the environment from the impacts of agriculture, such as sediment loss. Buffer strips are an example of the mitigation techniques used in such schemes to minimise nutrient loss into surface waters from overland run off.

Impacts of phosphates

Phosphate losses from agriculture may enter the water in the following ways:

- Manures or fertilisers direct from overspreading or from leaks and spills or washed off the field surface
- Water and wind erosion of soil carrying phosphate attached to clay and organic matter
- There can be significant leaching of dissolved phosphate through the actual soil profile when levels reach P index 4 and above
- Soil sediments and manures, containing phosphate, reaching field drains. This is increased in cracked or recently fissured soils (e.g. land drainage, deep subsoiling or mole draining)

Excessive nutrients in the watercourse damage the environment by upsetting its natural balance. It encourages more aggressive feeding plant and animal species that are more likely to take over a water body, thriving at the expense of other species. This reduces the biodiversity of the watercourse.

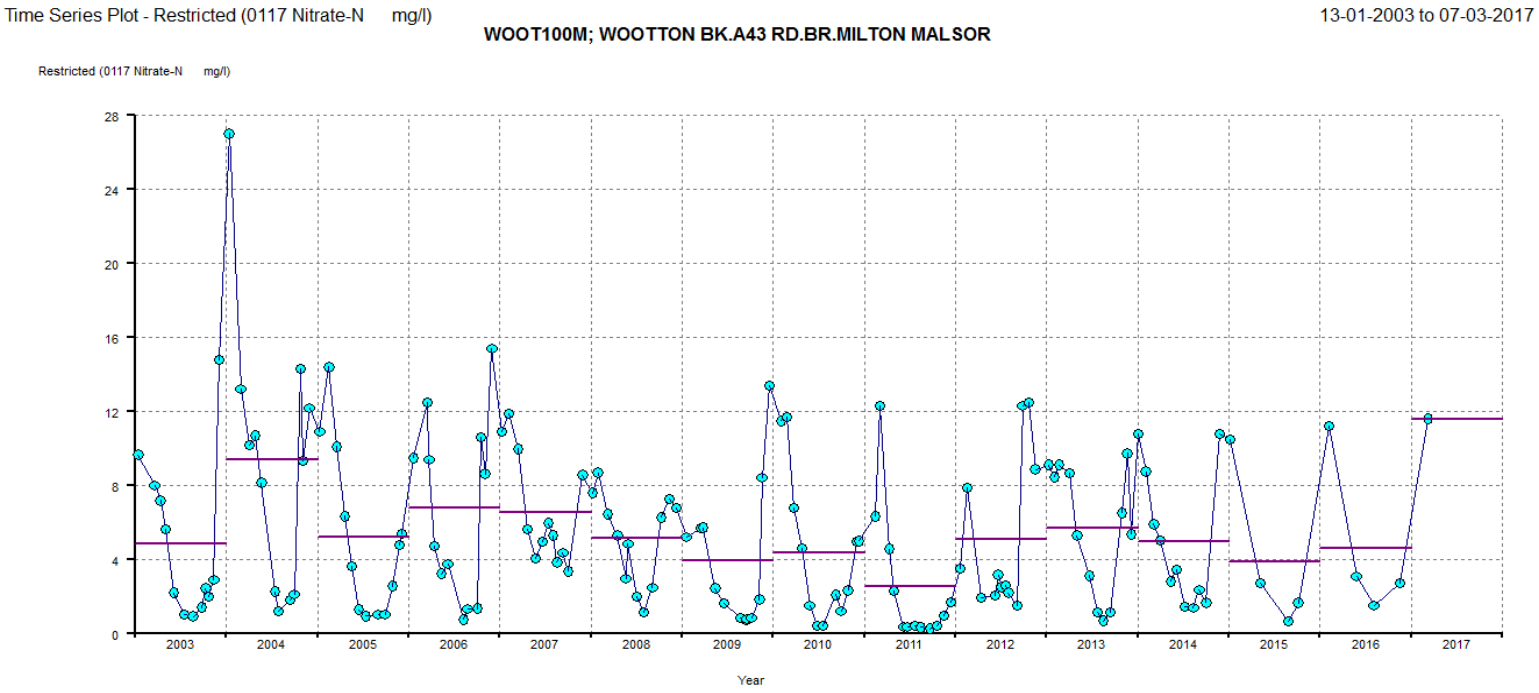
Sediment itself also affects the habitat of rivers by smothering riffles used by fish to spawn and changing river morphology. Managing and reducing sediment runoff can help to prevent damage to the environment and maximise the levels of phosphates retained in soil for crop growth.

Nitrates

The catchment of the Wootton Brook, along with most of England, is in a Nitrate Vulnerable Zone (NVZ). Assessments have shown that this catchment is at risk of nitrate pollution from agriculture.

Nitrate pollution problems occur when too much chemical fertiliser is applied to the land. The excess runs off and can find its way into drinking water sources, rivers and lakes. Some experts believe that high levels of nitrate in drinking water may pose a threat to health. In rivers, streams, ponds and lakes, too much nitrate can create a 'pea soup' effect. The water becomes clogged with fast-growing plant life like algae and weeds. This is a major problem especially in some areas of England such as East Anglia. In problem areas, some farmers voluntarily control their use of nitrogen.

The WFD limit for nitrates in water is 50mg/l. The graph below shows that levels of nitrates in the Wootton Brook are year on year below this limit.



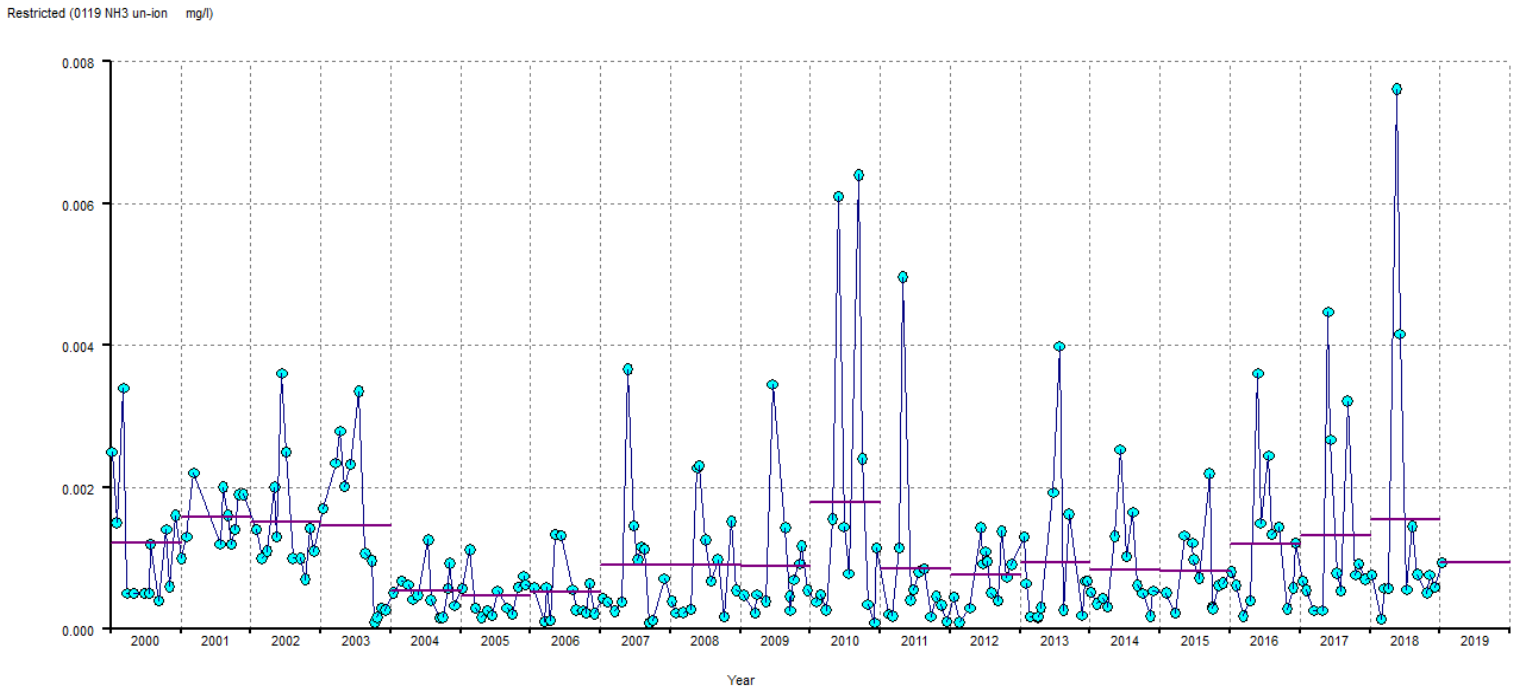
Ammonia

Ammonia is highly soluble in water and very toxic to aquatic organisms. Low concentrations of ammonia naturally occur in soil and are essential for plant nutrition. However, excessive use of fertilisers can result in leaching to watercourses. Sewage is another key source of ammonia in water.

The WFD limit for ammonia in waterbodies is 0.6mg/. The graph below shows that levels in Wootton Brook are consistently below this threshold. The catchment is therefore currently in 'Good' status in relation to ammonia levels. As the catchment is predominantly in a rural area, good farming practices are essential in order to maintain these low levels of ammonia.

Time Series Plot - Restricted (0119 NH3 un-ion mg/l) 05-01-2000 to 11-01-2019

WOOT120R; WOOTTON BK.ROTHERSTHORPE RD.BR.

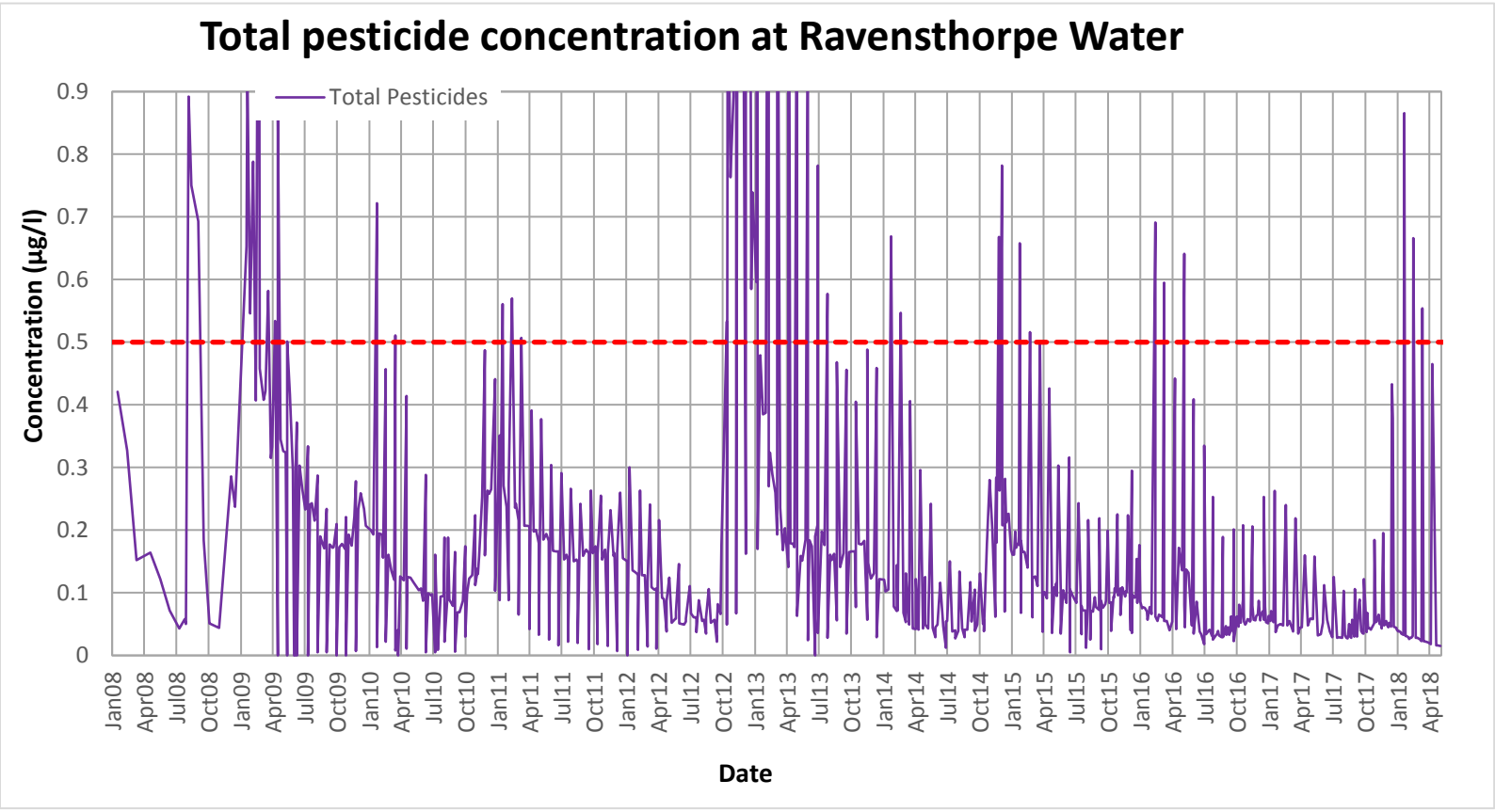


Metaldehyde and Total Pesticide Data

The drinking water limit for metaldehyde is 0.1µg/l. Metaldehyde is the most widely used pesticide for slug control. Pellets applied to crops on land can enter drains and watercourses during application or via run-off caused by heavy rain or prolonged rainfall events. A single slug pellet could contaminate 1000 litres of water to above the drinking water limit (this could be up to 23 miles of a small brook), so careful use is vital if we are to stop this valuable pesticide being banned.

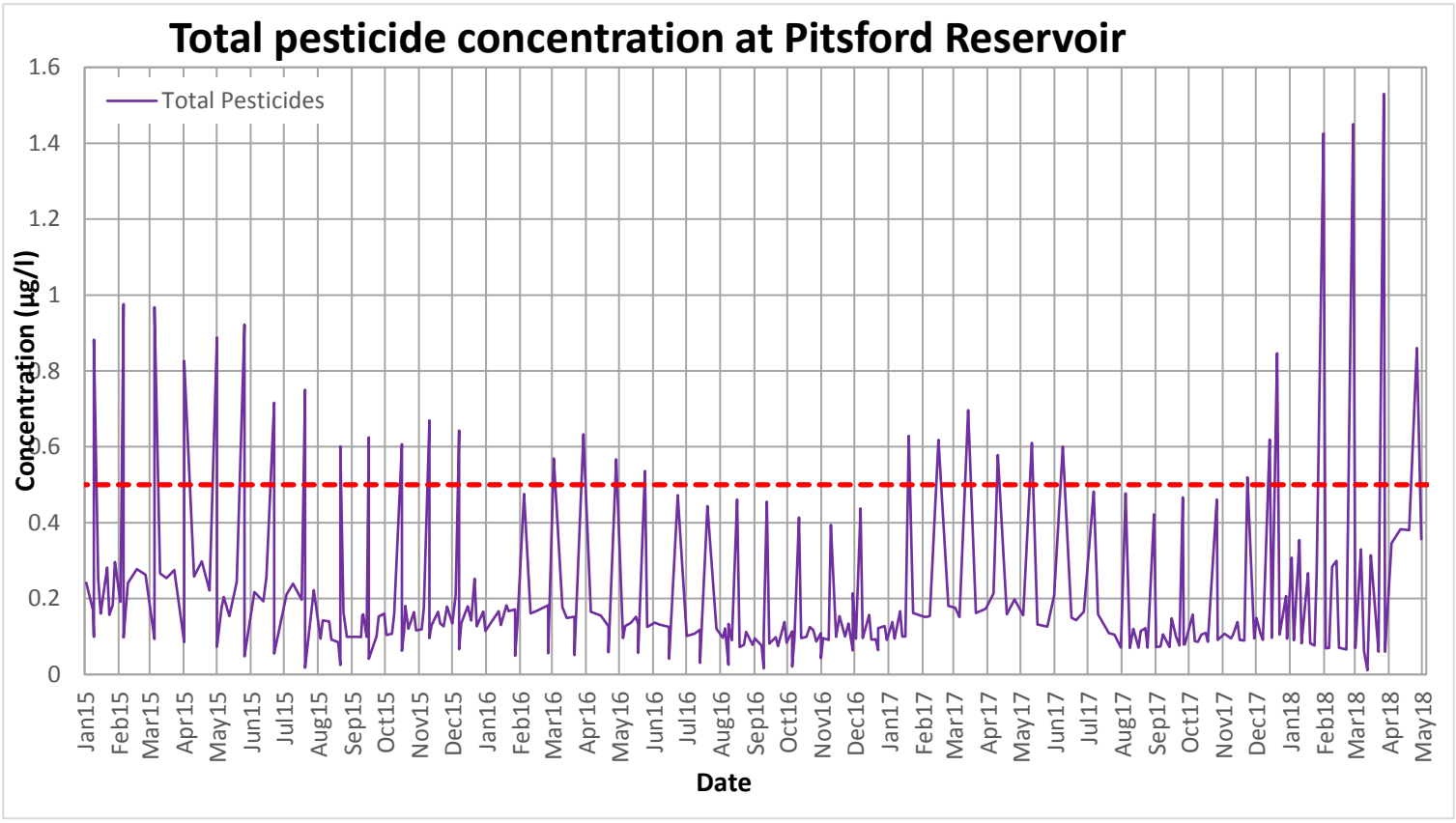
The Metaldehyde Stewardship Group (MSG) has launched a campaign called 'Get Pelletwise' to disseminate best practice advice to farmers and agronomists. Guidelines include leaving a 6-metre buffer around watercourses, maximum dosage rates and advise against application when heavy rain is forecast. The use of alternative products such as Sluxx, Ferric Phosphate and Methiocarb can also help reduce levels of metaldehyde reaching watercourses. Following these best practice guidelines not only helps to prevent contamination of watercourses but ensures efficient usage of this pesticide which minimises financial losses through loss of product.

The graphs below show the total pesticide levels for the Wootton Brook catchment Reservoirs. The presence of pesticides in these reservoirs highlights the need to implement good agricultural practices in all river catchments.



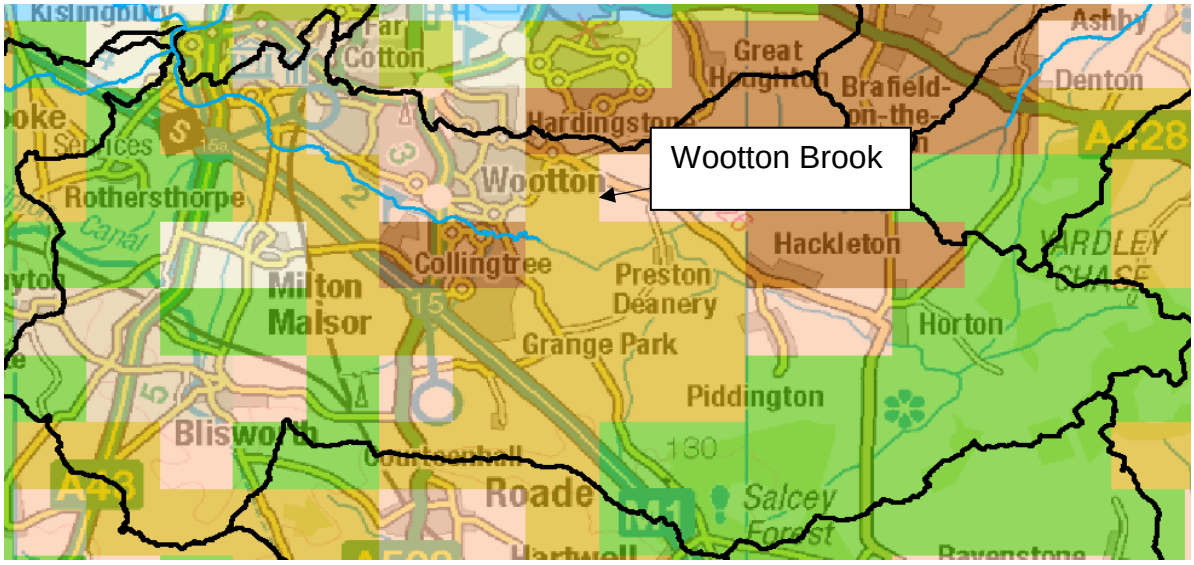
Raw water total pesticide concentrations in the Ravensthorpe Reservoir from 2008 – 2018. The 0.5 µg/l Drinking Water Directive standard is shown by the red dashed line. Source: Anglian Water

Raw water total pesticide concentrations in the Pitsford Reservoir from 2015 – 2018. The 0.5 µg/l Drinking Water Directive standard is shown by the red dashed line. Source: Anglian Water.



Soils

The soil is a farmer's most valuable resource. Soil security is vital if we are to ensure future food production. The map below shows the main soil types (1 km squares) for the catchments.



Colour	Soil Name	Description	Leaching potential
Green	Denchworth	Clay	Low
Yellow	Hanslope	Deep clay	Intermediate
Beige	Banbury	Loam over sandstone	Intermediate
Brown	Ashley	Deep loam to clay	Intermediate

Groundwater

The bedrock beneath the soil is connected and can store water (underground reservoirs known as aquifers). Limestone generally holds water the best and is therefore classed as a major aquifer, ironstone and sandstone are minor aquifers and mudstone has no aquifer.

The predominant geology for the Wootton Brook Catchment is a mix of limestone (Blisworth limestone formation) at the bottom of the catchment and Mudstone (Whitby mudstone formation) at the top end of the catchment. There are pockets of Ironstone (Northampton sand formation), Siltstone and Mudstone (Dyrham formation) and Limestone scattered throughout the catchment.

Catchment Sensitive Farming (CSF)

This catchment is in a CSF area under the Nene and Ise Catchment Partnership. CSF aims to reduce diffuse pollution from agriculture. This means farmers in this catchment have access

to free advice, workshops and training events to assist with soil, nutrient and pesticide management, as well as priority access to funding through the CSF Capital Grant Scheme.

To find out more contact your Catchment Sensitive Farming officer, Peter Brown, on Tel: 07342 080983 Email peter.brown@naturalengland.org.uk or go to https://www.gov.uk/government/organisations/natural-england

Campaign for the Farmed Environment (CFE)

The priority in Northamptonshire is surface water protection. The ELS options that contribute towards this are:

- Buffer strips – to slow, filter and trap pollutants (soil, nutrients and pesticides) before they enter the watercourse
- Cover crops - to reduce leaching of nutrients

Field corners – to reduce overland flow and erosion of soil

To find out about free events or to get more information, contact your local CFE Advisor Lesley Sharpe (Lesley.sharpe@live.co.uk or 07707 220121).

Metaldehyde Stewardship Group (MSG)

For more information on the MSG's campaign 'Get Pelletwise' please visit their website:

http://www.getpelletwise.co.uk/

Or for general enquiries they can also be contacted on: Tel. 0845 177 0117

In addition to best practice guidelines for farmers, the website offers advice on issues such as dose rates and machinery settings.

Helpful Links to find what's in your catchment

Listed below are some links to information about protected drinking water zones, nitrate vulnerable zones, aquifer locations and much more.

https://environment-agency.cloud.esriuk.com/farmers/

https://magic.defra.gov.uk/MagicMap.aspx and check for layers.

http://www.environment-agency.gov.uk/homeandleisure/37793.aspx
https://magic.defra.gov.uk/MagicMap.aspx

What can you do next?

If you would like to collect some of your own water quality data, arrange a free Catchment Sensitive Farming visit, or simply to discuss the issues further then please contact the Nene and Welland Catchment Partnership team (see CSF section for details).