

Wharnccliffe dam pond water sample summary

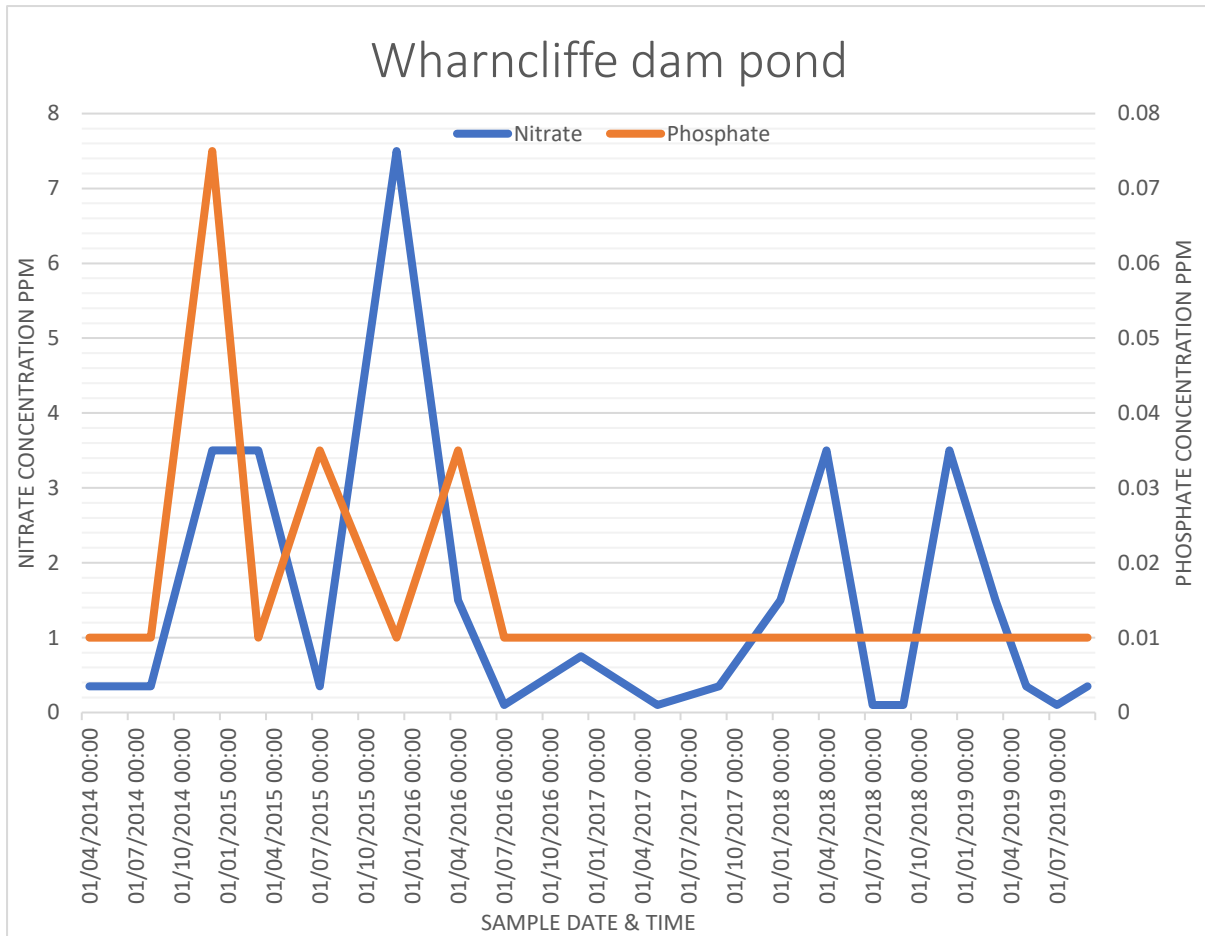


Chart showing Nitrate (blue) and Phosphate (red) concentrations in Wharnccliffe dam pond over a five year period

Water sampling at Wharnccliffe dam pond was started in 2014 as part of the Freshwater Watch citizen science project. Originally part of a global HSBC Water programme (running 2012-2017) this was a collaboration with Earthwatch Institute who then took over the project in 2018.

Water samples were tested for Nitrate-N and Phosphate-P nutrients. High levels of both these nutrients can cause eutrophication in water bodies and they are pervasive pollutants in freshwater ecosystems globally. The analysis was done with easy to use kits which provide an in-field colourimetric reaction for unfiltered water samples which are compared to six-point colour charts (one for Nitrate and a different one for Phosphate) to indicate the nutrient level range.

The data for Wharnccliffe dam pond shows that over the five-year period that samples were analysed it has a 'good' or a 'very good' ecological status. Nutrient concentrations and turbidity are generally low, and there is no evidence of algal blooms or sediment loads. These values are expected to vary throughout the year as a result of weather patterns and changes in land use.

It has long been known that Nitrate and Phosphate levels can vary seasonally, often reaching lowest levels in late summer when these nutrients have been removed from the waterbody and built into

aquatic macrophyte and algal biomass, then climbing again in winter as biomass dies back and decays, releasing nutrients back into the water.

The Wharncliffe dam pond Nitrate peaks /troughs seem to reflect this natural cycle however this has not been seen as clearly with Phosphate levels which have been consistently low since July 2016.

In addition, while taking and analysing the samples a range of aquatic insects (including water boatmen and dragonflies), newts, snails, floating and emerging plants and low litter levels have been observed which correlate with the good ecological status shown by the nutrient levels.

Results from the Freshwater Watch project in the greater London area suggest that small waterbodies (ponds and small lakes) with a larger proportion of semi-natural land cover are less nutrient polluted than streams and rivers. In large urban areas they can act as a potential refuge for freshwater biodiversity and maintaining high quality land cover around standing waters and lakes could be an important part of this.

References:

Finding clean water habitats in urban landscapes: professional researcher vs. citizen science approaches. Elaine McGoff et al; Science of the Total Environment 581-582 (2017) 105-116

Freshwater Watch 2016 Field report - Waterbodies of the UK – Elaine McGoff