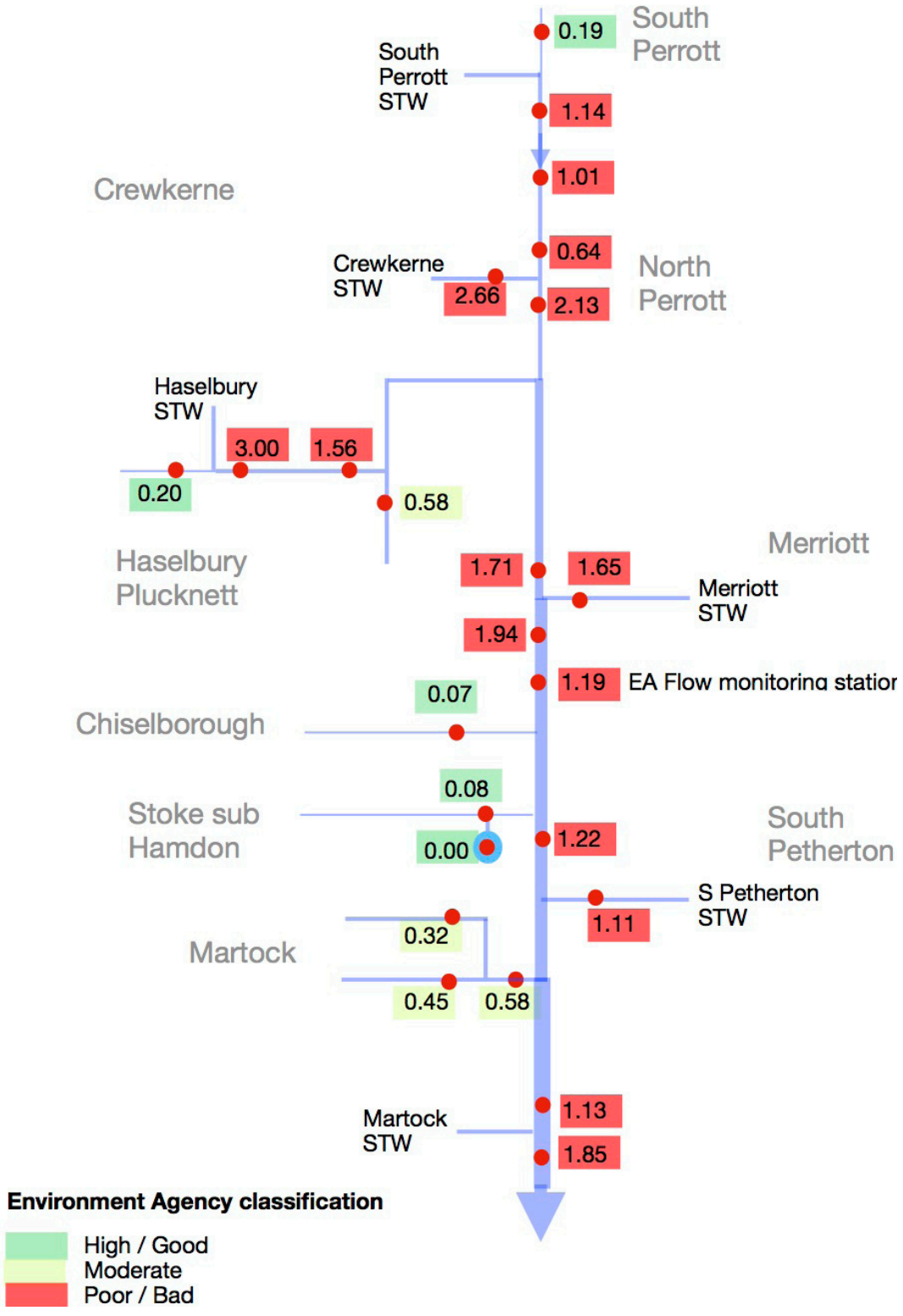
Ash and Martock Nature - Phosphate Survey

Report 6

Parrett midsummer snapshot, June23

We have had a period of dry weather and the Parrett flow, measured by the Environment Agency at Chiselborough has reached a usual summer low of around 0.4 m^3/s. A survey was carried out on June 21/22 of the whole river from South Perrott to Gawbridge near Martock where it begins to enter the Levels between artificially raised banks. The results are shown (in mg/l) in this schematic diagram of the Upper Parrett. They are colour coded based on the Environment Agency classification



The samples were taken, access permitting, up and downstream of significant confluences. The flow rate was low, about 0.3m3/s at the EA station at Chiselborough bridge. Most of the flow was generated sewage treatment plant effluent. The picture is very similar to that of the survey carried out in the summer of 2022.

The values shown for phosphate concentration are mg/litre (or ppm) phosphate (PO_4, not P). The table below shows the Environment Agency categories for the West Sedgemoor Parrett. Note that the diagram shows phosphate concentrations and not elemental phosphorus concentrations which is now the national academic standard. We have not adopted this standard yet as our US-made colorimeters are calibrated in phosphate units.

EA Category	**Phosphate concentration (mg/l, PO_4). Used in this report.**	**Elemental phosphorus concentration (mg/l, P). Used by EA**
High	< 0.15	< 0.05
Good	0.15 - 0.27	0.05 - 0.09
Moderate	0.28 - 0.66	0.10 - 0.22
Poor	0.67 - 3.33	0.23 - 1.11
Bad	> 3.33	> 1.11

Conclusions

1. The main source of phosphate, by far, is Sewage Treatment Plants (STWs), none of which, in the Parrett catchment, have phosphate removal stages.
2. In between injections of phosphate by STWs, the concentration in the river gradually falls, suggesting routine absorption by river plants and sediment.
3. There is some evidence of agricultural phosphate in streams such as Broad Brook, at Frog Lane in Haselbury, and the streams through Martock, but these are classified as moderate.
4. There is no evidence of significant agricultural point source phosphate (this has been seen in the past from a farm near Haselbury Plucknett).
5. A caveat. The test does not reveal organic phosphate–phosphate chemically bound to organic compounds–which we know exists but cannot detect or assess.

Phosphate flow through the Chiselborough EA Station

The EA station at Chiselborough - roughly in the centre of the diagram - collects real-time data of the flow rate[1]. Measuring the concentration at the station allows the calculation of the phosphate flow rate there; it is currently about **40kg/day**.

This seems to be a baseline value below which the river does not fall and, as such, probably represents the input from the Parrett STWs as this must be assumed to be fairly constant through the seasons and be independent of weather conditions.

The river is being sampled for phosphate weekly at the EA station and the concentration of phosphate varies little over time. This means that the phosphate flow rate mirrors the river flow rate and varies by an order of magnitude according to the weather. The source of the phosphate in the sediment is debatable but this survey suggests that at least some, and probably most, is additional phosphate from STWs. This issue will be looked at in greater depth in Report 7.

Andrew Clegg
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1 http://environment.data.gov.uk/hydrology/explore