

**River Chet Condition Update Including Water Level Monitoring**  
Report by Senior Waterways and Recreation Officer

**Summary:** This report provides members with an update on the condition of the true left bank of the River Chet and the results of water level monitoring that the Broads Authority has been carrying out since May 2016. The report also outlines the latest position regarding the proposed removal of the navigation channel markers that were installed between Chet Mouth and Hardley Wherry Staithe after flood defence works were completed on the banks of the river.

**1 Introduction**

- 1.1 Members will recall that at the meeting of the Navigation Committee on the 8<sup>th</sup> of September 2016 a report was presented on the condition of the true left bank of the River Chet and a number of other issues regarding the River Chet including the management of the Wherryman's Way, the hydrology of the River and the fact that 37 channel markers are positioned in the river between Hardley Wherry Staithe and Chet Mouth.
- 1.2 This report gives members an update on the position regarding these matters.

**2 The Wherryman's Way Footpath on the True Left Bank of River Chet at Hardley Flood**

- 2.1 As indicated in the report considered by members at the Navigation Committee on the 8<sup>th</sup> of September the County Council has closed the Wherryman's Way at Hardley Flood under a Traffic Regulation Order (TRO) rather than extinguishing the public footpath on the bank. Having adopted this approach the County Council is now seeking to commission hydraulic modelling to assess the likely impacts of a range of potential future scenarios for the future management of the bank.
- 2.2 The Broads Authority has provided a brief for the hydraulic modelling that is required and Broadland Environmental Services Ltd (BESL) has been asked to provide a quotation for the costs of the modelling work. Once the quotation is received the County Council has undertaken to convene a meeting of the public authorities with an interest in the Chet to discuss the funding of the study.
- 2.3 Aside from assessing the feasibility of reopening the footpath the study is also required so the public authorities can have a full understanding of the potential effects of various management scenarios for the bank on water levels, flows and velocities in the river and Hardley Flood and importantly to

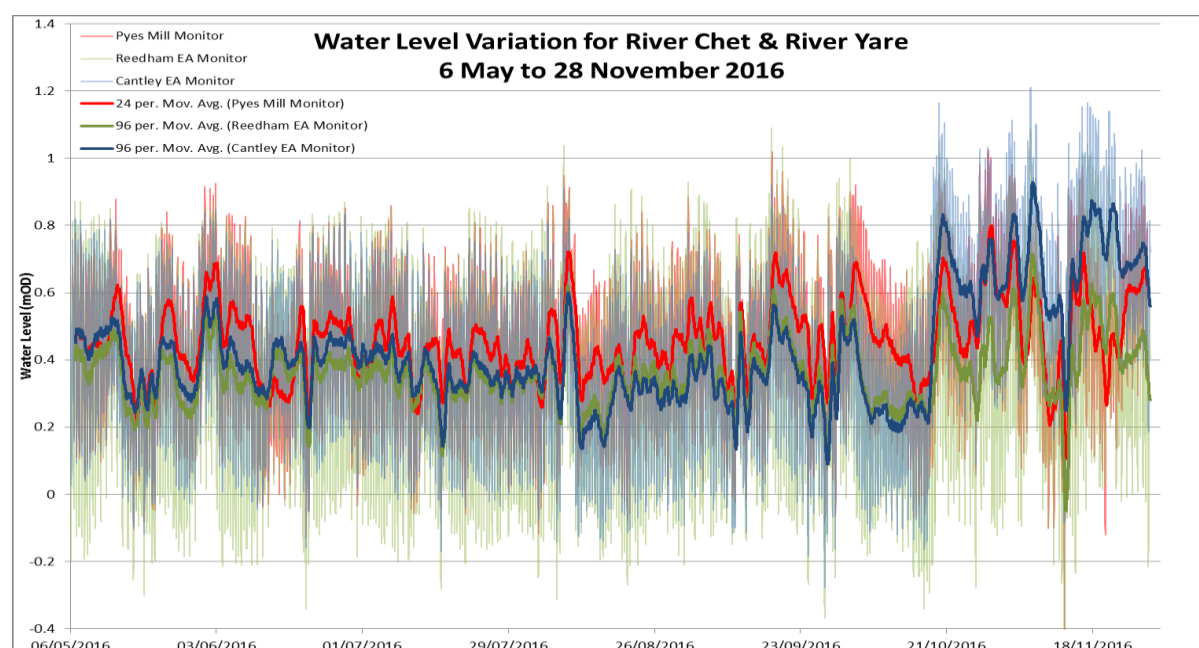
assess the likelihood of adverse impacts on the Hardley Flood SSSI, hydrology and navigation occurring in the future.

- 2.4 In the meantime the Broads Authority has carried out the first of two seasons of programmed tree and scrub clearance work on the bank which was jointly funded by Norfolk County Council. This work removed trees at risk of collapsing and creating new weak points on the bank and cleared scrub on the front face of the bank to encourage reed growth. An additional benefit of the work is that it has cleared sections of the bank that require strengthening. This will allow the Authority to reuse sediment dredged from the river in operations programmed to take place over the next three years to bulk up the bank at low and narrow sections.

### 3 Water Level Monitoring Data

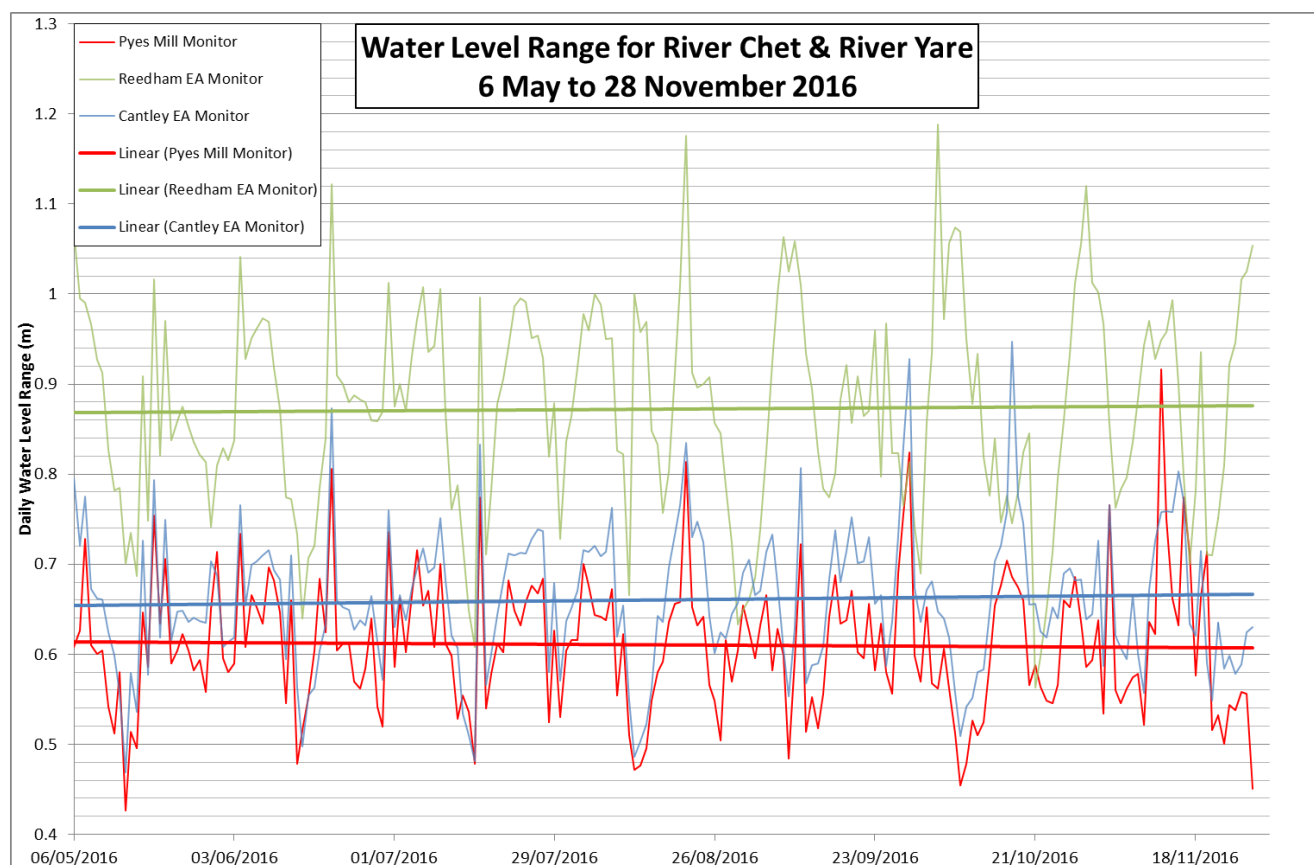
- 3.1 Members will recall that officers had been presented with anecdotal evidence from local businesses that the deterioration of the bank was having an adverse impact on tidal flow and water levels upstream of Hardley Flood. The Authority has therefore been monitoring water levels on the Chet at Pye's Mill between 6<sup>th</sup> May 2016 and 28<sup>th</sup> November 2016. Water levels have been recorded using a Solist Levellogger and the data has been compared to Environment Agency water level data from monitors at Reedham and Cantley on the River Yare.
- 3.2 It is clear from the data that water levels at Loddon are following a typical tidal cycle of highs and lows. All the monitoring locations show a broadly similar pattern of water level variation. The daily average water levels at Cantley and Reedham are very similar (typically within 50mm) while at Pye's Mill the daily average water level is often slightly higher. Figure 1 shows the water level variation graph with a bold trend line for each site.

Figure 1



3.3 The monitoring has also compared tidal range at Pye's Mill, Reedham and Cantley. From the data it is clear that tidal range at Reedham is greatest which is to be expected as it is the monitoring site closest to the sea. Tidal variation at Cantley is similar to that on the Chet at Pye's Mill although as indicated in paragraph 3.2 above the average water level at Pye's Mill is often slightly higher. The daily range at Pye's Mill is typically about 50mm smaller than that at Cantley. From analysis of the data it is clear that the pattern of change in tidal range at Cantley and Pye's Mill was a close match throughout the majority of the monitoring period. The range at Reedham was also very similar to that at Cantley and Pye's Mill between May and October but after October the range did not trend so closely. This is likely to be due to a calibration issue with the Reedham monitor. Figure 2 shows a comparison of the tidal range data from the three monitors used.

Figure 2



3.4 From the analysis of the data we can conclude that the tidal range and water levels in the Chet respond to tidal influence in a broadly similar manner to the sites monitored on the River Yare and officers do not therefore currently have concerns about water levels upstream of Hardley Flood.

## **4 Channel Marker Posts**

- 4.1 At the meeting of the Navigation Committee on the 8<sup>th</sup> of September members supported the removal of the steel channel marker posts that were installed to mark the channel after the completion of flood defence works on the River Chet. Since then officers have been in discussion with the Environment Agency and BESL regarding the removal of the posts and the costs of the necessary work.
- 4.2 At a recent meeting it has been agreed that the Environment Agency will contribute 50% of the costs of the work. At the moment the exact costs are unknown as the methodology for the removal of the posts has not been decided on. The Authority is therefore proposing to carry out a test removal in summer 2017 when it will have dredging equipment near the mouth of the River Chet. This will determine whether the operation can be carried out from the bank or whether floating plant and additional specialist equipment will be required. The main works have been programmed for the period between November 2017 and January 2018 to minimise impacts on navigation. On completion of the works the Broads Authority will invoice the Environment Agency for 50% of the costs.

## **5 Conclusions**

- 5.1 Good progress has been made on each of the issues outlined in this report. The approach advocated by the Authority for the Wherryman's Way has been accepted by the County Council and officers are now working with the County Council in partnership on tree works and to procure the study required to inform an options appraisal for the future management of the bank. As regards current navigation management the tree clearance works already carried out and future dredging operations will also benefit navigation by maintaining the required Sediment Management Strategy Waterway Specification depths. Additionally the ability to side cast dredged sediment will assist in future bank works. Finally officers have had a positive meeting with BESL regarding the removal of the channel marker posts and have received some helpful advice regarding the methodology for the proposed works.

Background paper:	None
Report author:	Adrian Clarke
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Broads Plan Objectives:	TR1/ TR3/ NA4
Appendices:	None