



On 27th November, two groups of members visited the rebuilt Foss Barrier. One group met on the riverside footpath by the Novotel for a talk, and the other, suitably equipped with safety boots and hi-vis, was given a tour round the installation. Both were guided by Mark Fuller of the Environment Agency.

Everyone who was living in York at the time will remember the floods of Boxing Day 2015 when the Foss attained its highest ever level, flooding hundreds of houses along its lower reaches.

This was due to the pumps and their electrical supply, which were behind sealed flood doors, being flooded via a failed underground electrical duct. This meant that the whole building had to be evacuated and the barrier raised to prevent the Foss from reaching even more dangerously high levels.

Not only was the Ouse thus able to back up the Foss, the traditional reason for floods in York, which the barrier was built to prevent, but also, a heavy local storm over the upper reaches of the Foss meant that even more water cascaded down it.

The eight pumps originally installed when the barrier was built in the 1980s were able to transfer $30\text{m}^3 \text{sec}^{-1}$ (=30 tons per second) from the Foss into the Ouse, but on that fateful day, almost $40\text{m}^3 \text{sec}^{-1}$ came rushing down, meaning that the pumps would have been unable to keep up, even if they had been able to keep running. Those pumps have been replaced by units capable of handling $50\text{m}^3 \text{sec}^{-1}$, ramping up to speed controllably, making them less liable to harm fish or other wildlife. They are protected from damage by storm driven debris by a long trash screen which is automatically cleaned by a pair of grabs (yet more redundancy) and which, during the recent high river levels, (around $17 \text{m}^3 \text{sec}^{-1}$ for comparison) filled

three skips with anything from trees to fishing platforms and anything else which floats.

Once the sequence has been authorised by the operator, the barrier is automatically lowered by a (duplicated) electric motor, taking around eight minutes to close fully. This action can be controlled locally.

A positive barrier



An enthusiastic group visited the rebuilt Foss Barrier. Photos by Michael Reakes.



Mechanical grabs catch debris and remove it from stormy waters

An extra level has been added to the control building, meaning that all the electrical and control equipment is out of reach of any

future floods. Back-ups abound, with all the control systems duplicated, and several layers of redundancy built in too. Sensors in the Foss basin measure water levels and are used to initiate the closure of the barrier once the pumps have ramped up. None

of the control systems are connected externally, not even the monitoring devices, to avoid any chance of hacking or interference. There is always a potential for terrorist action.

The pumps are powered via a buried high tension cable, with transformers in adjacent buildings. Finally, there are two 5MW standby diesel generators kept warm ready to start instantly, with a two day supply of fuel (filtered in case of any contamination whilst stored), and even an underground pipeline allowing refuelling in case of a lengthy flood.

The site is manned constantly when there is an alert, so that the automatic systems can be closely monitored, and

any necessary action taken to alleviate problems that might occur. The staff of ten rotate during these periods, all being trained to the high standards needed, should something go wrong.

Thank you to Mark Fuller and Jon Clark for their time, and for explaining how the barrier system works, and patiently answering all our questions.

Mike Gray

Did you know that the River Foss Society is on Facebook too?



A start to Spring

FEBRUARY

Thur 22 February 7.00 pm Pint 'n a Chat. Mason's Arms, next to Castle Mills Basin. All welcome, just turn up.

MARCH

Thur 28 March 7.00 pm Pint 'n a Chat. Mason's Arms, next to Castle Mills Basin. All welcome, just turn up.

APRIL

Sat 6 April 9.00 am Riverside Litter Pick. Meet at footbridge on Foss Islands Road. Please let Barry Thomas know if you are coming. Contact: Barry Thomas.

Sat 6 April 10.00 am Walk Huntington to Strensall (4 miles). Meet at All Saints Church car park. Return by foot or by bus. Refreshments at the Ship. Please let Derek Chivers know if you are coming. Contact: Derek Chivers.

Wed 17 April 7.00 pm AGM preceded by a talk by Monika Smieja, Project Officer River Restoration. 'The Foss Green Corridor'. Contact: Michael Alexander.

CONTACTS

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The River Foss Society is taking part in York's first City Nature Challenge, a global event, started in 2016 involving Los Angeles and San Francisco. It aims to motivate "people around the world to find and document wildlife in their own cities".

There is a global website (<https://www.citynaturechallenge.org/>) as well as the City of York Challenge website (yorkcitynaturechal.wix-site.com). The York team is led by one of our biological monitoring volunteers, John Terenzini.

We are looking for anyone who has an interest in the biology of the Foss – birds, moths, butterflies, other invertebrates, wild plants, trees, lichen, mosses, fungi, mammals, etc – who could offer some time over the four days to either lead a group looking for plants/animals in your special area of interest, or as part of a 'multi-species' team looking for whatever can be found.

It could be a walk along your favourite stretch of the river, in woodland alongside the river, in one of the river's nature reserves – it's up to you. We will have our gazebo at sites along the river where we can explain to the public what's going on and encourage them to take part so you might want to help with that.

There is no need to identify everything, that's where the iNaturalist App comes in, photos (or bird songs) are uploaded to that via phone or camera. We just want leaders who have an interest, would be happy to encourage people to join in, and would be willing to help us add to

York's overall count in the challenge whilst encouraging people's interest in the Foss, and perhaps even getting them to join the Society as they've had such a good time and learnt a lot!

Mike Gray

York's First City Nature Challenge 26th-29th April

Scientific Monitoring

Biological Monitoring of the river started in October 2022 using our trained citizen scientist volunteers and we expect it to continue well into the future. We take industry-standard kick samples, currently at 14 sites on the river with one on a tributary. The macroinvertebrates in each sample are sorted, identified and then biological indices are calculated using the presence and abundance of the animals found to assess the biological health of the river at



Kick sampling in the Foss. Photo by Sarah Watson.

these sites. Samples must be taken in spring and autumn, any taken between these times are a bonus. All results are forwarded to our contacts at the Environment Agency (EA) on an annual basis, unless a site shows significant deterioration when the EA will be informed immediately, and to other interested local environmental organisations if they request a copy.

Barbara Hilton

Don't forget our website:

www.riverfossociety.co.uk

Flood Alleviation

On 18 October, at our Open meeting, we were pleased to welcome Richard Lever of the Environment Agency, who brought us up to date on the progress of the Strensall Flood Alleviation Scheme.

This scheme was devised in response to the Boxing Day 2015 floods following which £43m was allocated to flood reduction around York. Much was spent on hard defences around the city centre, and the Foss barrier pumps were updated from 30-50m³/sec, and its electrics protected, but some 400 homes further up the Foss remained vulnerable.

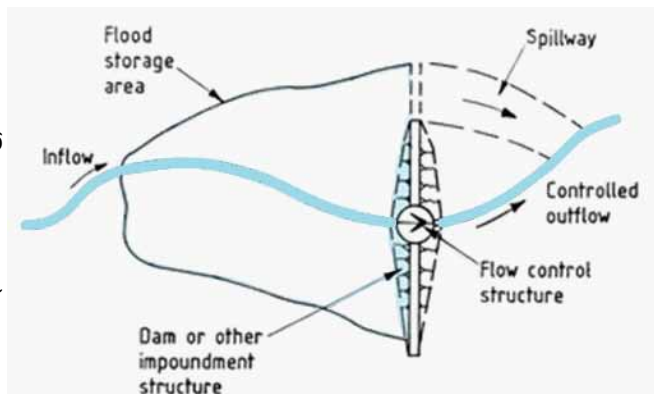
The barrier prevents the Ouse backing up the Foss only as far as the bottom of Huntington Road, above which some homes would still be vulnerable to an event similar to 2015, so a holding area was proposed as close to York as possible, to reduce the peak flow of water. The site chosen was just upstream from Strensall.

Surveys were undertaken including the suitability of the land for such a structure, and what wildlife it supported and how it could be protected. Planning permission was granted in 2019 conditional on several "mitigations" and environmental guarantees. The river was to be reprofiled introducing more curves, two ponds were to be created and stocked with suitable vegetation, (being private land there will be no public access, though one should be visible from Centurion Way). Reeds will help filter out sediment, three trees have been planted for each removed, and broken ground has been returned to agriculture.

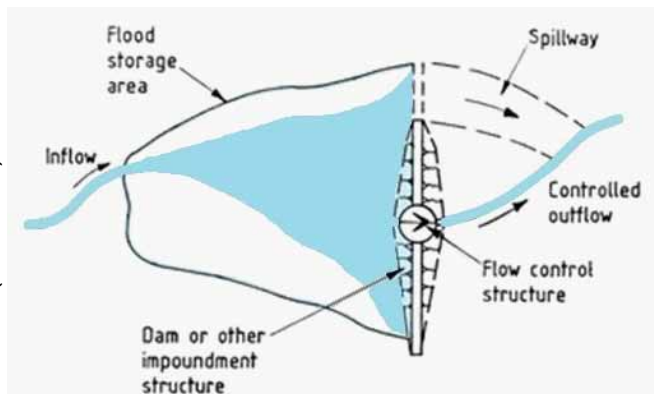
The holding area, which is mostly low lying, is surrounded by a bund built of clay excavated on-site, and meeting permanent reservoir standards, was compacted and allowed to green over. The 500m overspill section is protected by a honeycomb of concrete to resist erosion, and has also greened over.

A short concrete dam has been built with the river flowing through it in a pipe ending in a 1.9m diameter steel plate which throttles the flow to about 10 m³/sec. This can be changed if the throughput needs to be altered. When the flow exceeds 10 m³/

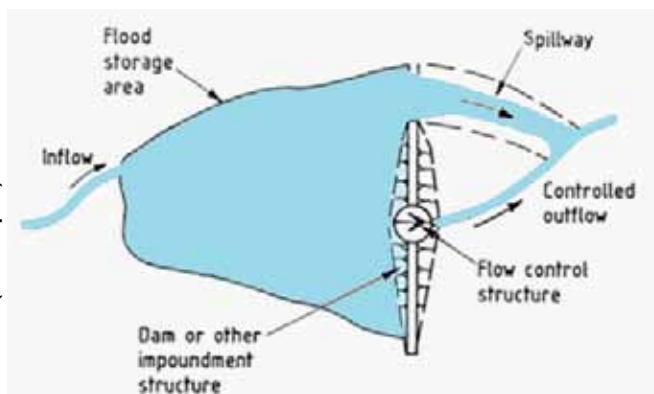
Typical weather
(free flowing)



Very wet weather
(throttled)



Extremely wet weather
(overspill)



How the structure works. From the Environment Agency.

sec water will build up in the flood area and be held back until the flow reduces, allowing the flood area to drain. There is an overspill to the river should the holding area be full – estimated as a 1 in 300 year chance.

Several weeks were lost due to wet weather last year, otherwise it would be ready by now. A five year maintenance and snagging contract will be put in place – no decisions seem to have been made after that point, though there will be flow monitoring probes and there are access roads to the dam for maintenance.

Mike Gray

Louie Johnson-Tod is a student at Durham University entering his final year. He joined the RFS during his last summer vacation and made known his love of history and his wish to get involved in that of the RFS. His timing was impeccable, being the society's 50th anniversary, and the result of this wish is his detailed history of the society, which is now available to read on the website. He talked to sev-

A History of the Society

eral members who have been part of the RFS since the beginning, and then trawled through the available material to come up with a unique view of our history.

No history can be complete, though this is very comprehensive, so should you have any archives or knowledge that could add to Louie's story, please let me know.

Mike Gray

The Environment Agency scheme being installed at Strensall is now nearing completion, having been delayed through heavy rainfall making ground work extremely difficult. The photograph (right) taken on December 14th 2023 shows the main structure which will contain the flood water control device. The remaining work is the finishing of the construction of the flood banks, and when the water level drops, the fitting of the orifice plate within its concrete housing will control the output of the flood water. Matting has also been installed at the top of the flood banks to consolidate the banks and reduce erosion.

An important environment



The newly constructed flood barrier



One of the two new wildlife lakes, already well populated

Further upstream, approximately a quarter of a mile from the footbridge over the Foss, the Environment Agency are installing two large lakes for the benefit of wildlife. One of the lakes is close to

and can be viewed from the Foss Walk public footpath to Sheriff Hutton. Already the nearest lake contains several species of birds including approximately 200 greylag geese, four mute swans, six cormorants and several species of duck. The installation of this wildlife lake will be an added attraction to walkers on this section of the Foss Walk. The other lake is further away from the footpath but can be viewed with binoculars, but at the moment there is no footpath or public access to this furthest lake.

From the Foss footbridge going north, running alongside the public footpath, a temporary road for construction vehicles has been installed; access to this road is possible but it is extremely muddy in places and walking boots or wellies are recommended.

John Millett

The final litter pick for 2023 took place on Saturday 14 October. Eleven members met at the starting point on Foss Islands Road, only to be told that the CYC boat, Foxy, would not start. Without the boat we could not work on the water, so we were all committed to litter picking along the river banks and adjacent areas upstream to the Blue Bridge and the junction with the River Ouse.

Dry Picking

As always, the most heavily littered areas were around Castle Mills Bridge, St George's Field and The Castle car park. We found a bike which had been left against a hedge in St George's field and was not in a usable condition. The brakes were totally ineffective and in need of replacement. We will pass this bike to a person who maintains and repairs bicycles and then hands them over to people in need of a bike.

Barry Thomas



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