

## Reducing Flood Risk: stream improvements and water storage



Photo by Rebecca Walters.

**This case study describes how The Granary Hotel and the Fawsley Estate near Daventry, Northamptonshire, undertook work to improve the flow of a stream running close to the hotel, creating space to store water and reducing flood risk to protect the business.**

### About The Granary Hotel

In 2006 the Trustees of the Fawsley Estate decided to convert the 17th century farm buildings into ten ensuite bedrooms, a conference facility with dining room, kitchen and hotel reception – all located within the former cowsheds, stables and corn storage, hence the name “Granary Hotel”. The conversion took nine months and the business opened in mid 2007.

### The Problem

At the time of the conversion and the opening of the business, it was not realised that the stream on the south side of the property (flowing west to east) was prone to considerable flooding at times of heavy rain, particularly in winter. The water drained off the meadows to the west of the property - approximately 300 acres sloped into the valley for a distance of over a mile. Where the stream ran through a narrow gorge, it did not flood land, however when it arrived at the flat area it could not drain, and land surrounding the property was liable flood up to and around the newly converted buildings.

The cause of the flooding was the single 24 inch diameter pipe beneath a poorly built farm access bridge. When the water came out of the pipe under the bridge, it flowed for 30 yards into a culvert that took the water underground for a distance and then eastwards through another narrow gorge to the Dingle Wood and the Fawsley Lakes.



### Impacts on the business

From the business point of view it created an extremely difficult situation. Access to the car park and parking generally was virtually impossible during flood conditions. The damage to the walls and foundations of the building on the south-west corner, and the risk of dampness showing up in bedrooms and therefore making them un-lettable, were real concerns.

The potential for rapid losses was therefore a significant threat to the business, which the landlords were keen to rectify immediately.



Flooding at The Granary Hotel.

The former flood area is at the corner of the building in the left-hand foreground.

Photo by Rebecca Walters.



## Solving the problem

The Estate provided its own staff and machinery to solve the problem. They first dug out a small “storage” lake to the west of the bridge and adjacent to the car park. This lake is approximately 50 yards in length and up to 8 yards wide. At the east end of the lake a large tree trunk was laid across the width of the stream, creating a waterfall before the stream goes under the bridge. This has the effect of deepening the water up-stream of the tree trunk by 3 feet and enables the water to “back up” the valley or gorge at times of heavy rain, instead of flooding the adjacent area.

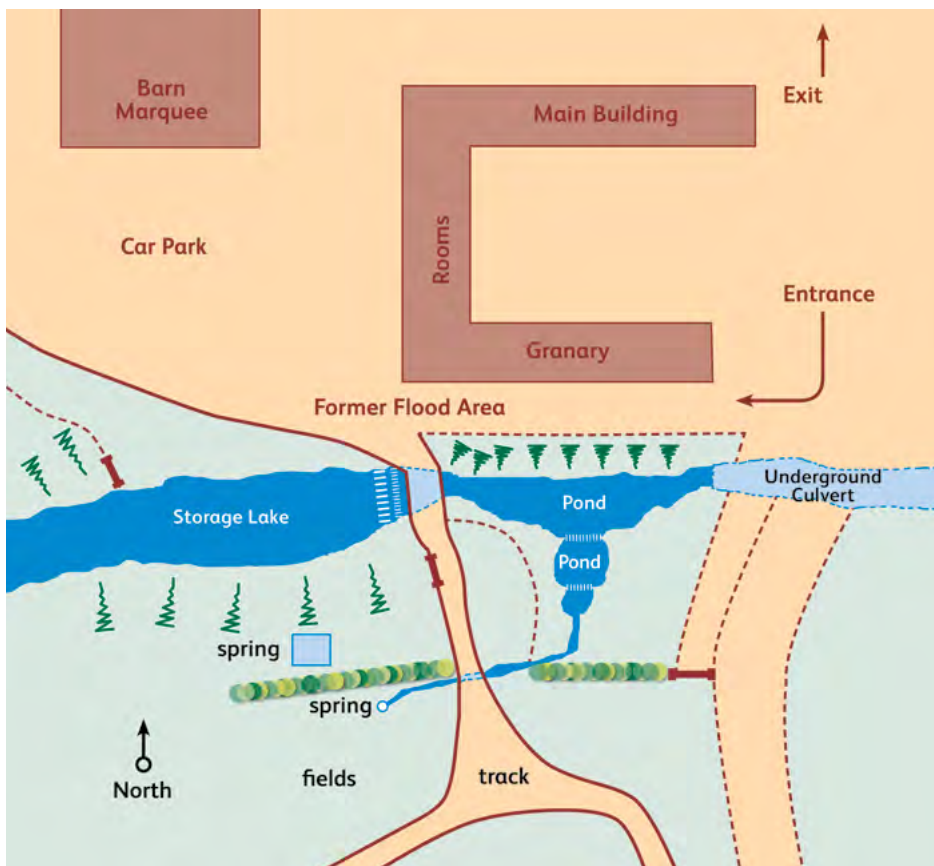
Next, they completely removed the track over the bridge and then the single pipe was replaced by two concrete pipes of the same dimension. They supported the pipes on concrete and constructed a concrete block wall at either side to the level of the finished track, and finally filled the track area with graded road stone and small top dressing similar to the grey stone farm track.

On the east side of the bridge the estate contractor created an attractive pond to protect the culvert with a water storage area. This was further enhanced by a two level pond entering the stream from the south. The reason for this was that a tiny spring in the next field had created a small water

run along the hedgerow and needed guiding into the major stream. These ponds could become an attractive feature in the future, with water plants such as watercress. Already, reeds are spreading in the lake and birds such as moorhens and mallard ducks are nesting in the centre of the water.



Work underway.



This diagram shows the hotel buildings in relation to the stream, and the location of the former flood area. It shows the features created to store water, namely the storage lake and the ponds. The stream flows from west to east.



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**Conclusion**

The work has undoubtedly been successful. During the winter of 2013-14, the wettest winter since records began, no problems occurred. The main stream worked as designed, with water backing up the valley as anticipated. The storage ponds are also working well and will improve the appearance and biodiversity of the area when they become established.

The business is now much less likely to flood, protecting it from disruption, cancellation of bookings and loss of revenue.

**A large tree trunk deepens the water up-stream, and allows the water to “back up” the valley at times of heavy rain**

Photo by Rebecca Walters.

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**Further Information**

**Weathering the Storm** – a guide to saving and making money in a changing climate:

**[www.climate-em.org.uk/resources/item/weathering-the-storm-a-business-guide-to-climate-change-adaptation](http://www.climate-em.org.uk/resources/item/weathering-the-storm-a-business-guide-to-climate-change-adaptation)**

Check your **flood risk** on the Environment Agency website, and sign up for **flood warnings**:

**[www.gov.uk/prepare-for-a-flood](http://www.gov.uk/prepare-for-a-flood)**

Prepare a **flood plan** for your business:

**[www.gov.uk/government/publications/preparing-your-business-for-flooding](http://www.gov.uk/government/publications/preparing-your-business-for-flooding)**

The **Business Resilience Health Check** is an online tool which you can use to create a bespoke action plan for your business: **[www.businessresiliencehealthcheck.co.uk](http://www.businessresiliencehealthcheck.co.uk)**

**Climate UK** is a national network of climate change partnerships, supporting businesses to prepare for climate change: **[www.climateuk.net](http://www.climateuk.net)**

One of a series of case studies about building business resilience to severe weather, developed as part of the Business Resilience in a Changing Climate (BRiCC) project, in partnership with the Environment Agency. Other case studies can be viewed at the web address below.

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[www.climate-em.org.uk/projects/building-business-resilience](http://www.climate-em.org.uk/projects/building-business-resilience)