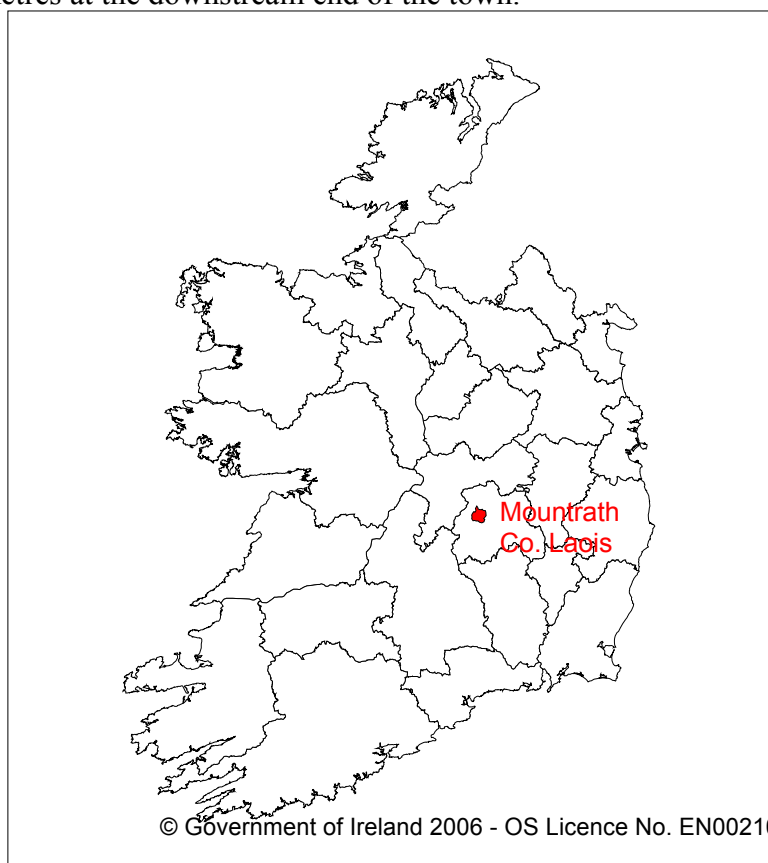


Flooding on the Whitehorse River, Mountrath, Co. Laois

Location

Mountrath is located in County Laois, in the centre of Ireland, just to the south of the Slieve Bloom mountains. The Whitehorse River, also known as the Mountrath River rises in the Slieve Bloom mountains and flows into the Nore south of Mountrath. The catchment area is approximately 42.8 square kilometres upstream of the town and 48 square kilometres at the downstream end of the town.



Map 1: Location of Mountrath.

Laois County Council has requested that OPW investigate the cause of flooding that occurred in Mountrath on 31st March 2008.

Environmental designation

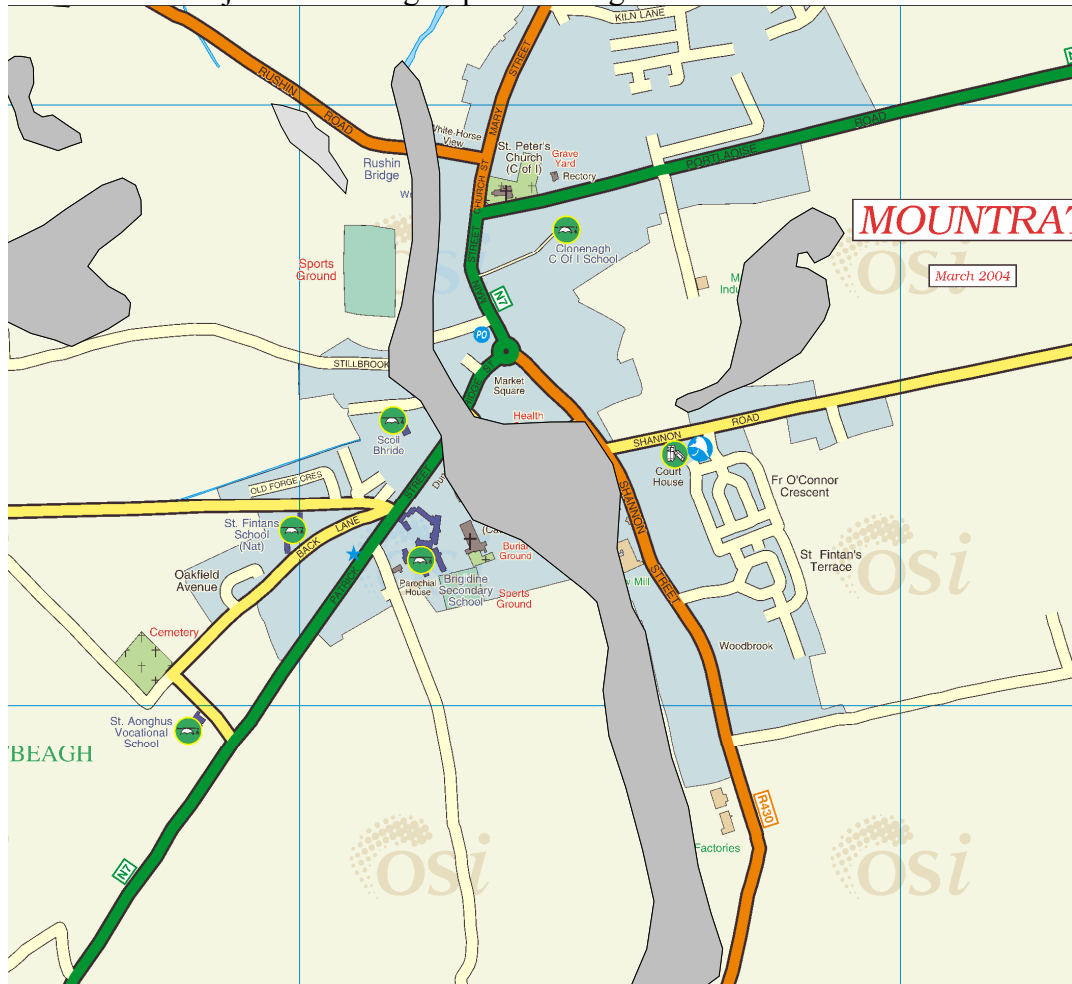
The Whitehorse River is designated under the Habitats Directive as part of the River Barrow and River Nore Special Area of Conservation, which includes most of the rivers in these catchments and has a wide variety of conservation aspects. The site code of this SAC is 2162. Of particular note is the unique population of freshwater pearl mussels located near Durrow, downstream of Mountrath. There may also be other conservation aspects of relevance in the Mountrath area.

Historic information

The following information has been collated from the Flood Maps website:

Shannon Road, Mountrath – the Mountrath River overflows its banks after very heavy rainfall. (Flood Id = 2660)

Under More mapped information, the valuation map was cross referenced with the extents of Mountrath. This map forms part of a dataset prepared by the Office of Public Works identifying land that might benefit from the implementation of (Major) Arterial Drainage Schemes (under the Arterial Drainage Act 1945) and indicating areas of land subject to flooding or poor drainage.



Map 2: Benefiting land in Mountrath, from www.floodmaps.ie.

Description of flood events

On 31st March 2008, a number of houses on Patrick Street, Mountrath were flooded early in the morning. Reports in local newspapers indicate that six houses were flooded. It is reported that flood waters reached a depth of up to approximately 600mm in these houses, which are all located on the right bank of the river upstream of the bridge over the N8. A flood envelope provided by Laois County Council indicates that two or three houses on the road beside the river upstream of the N8 bridge and four houses on Patrick Street were flooded. The river is indicated to be out of bank over most of its length through the town.

Sources and Mechanisms of flooding

Flooding on 31st March 2008

The flooding that occurred on 31st March appears to have been localised to an area on the right bank of the Whitehorse River and between Patrick Street and the GAA grounds.



Figure 1: The area that flooded. The river is behind the stone wall.

Water level information provided by Laois County Council does not show any major changes in water level, and it appears that the river flowed at or just above bank full. The area where the flood occurred is low lying. There are two possible entry points for flood water to the area, at a fenced section of bank beside some stepping stones, and along the river bank through the GAA grounds. There is also a small stream that enters the Whitehorse River at this point from the west.



Figure 2: Possible entry points for flood water. The stream enters the river in the stone culvert.

There is not enough information available at present to identify whether water followed one or both paths from the Whitehorse River or entered from the small stream.

There is no clear exit point from the area that flooded, and it would appear that flood water escaped through the towns surface water system and also back into the river at the points where it entered. The fact that the surface water gullies were well maintained would have reduced the duration of flooding experienced. While the river was high, however, flood levels would have remained high in this area. It would appear that flood water entered the houses on Patrick Street either through the rear gardens or by flowing along a low paved area and onto the footpath. The road appears to be higher than the paths in this area.



Figure 3: Rear of houses on Patrick Street.



Figure 4: View along Patrick Street and of paved area beside houses.

A sewerage pipe crosses underneath the N8 road bridge on a steel beam. This could form a control for flood water.

Magnitude of event on 31st March 2008

There is no hydrometric recorder in Mountrath, nor a rain gauge in the immediate catchment. The adjacent Delour catchment has an automatic gauge at Annagh, operated by Laois County Council. There are OPW hydrometric gauges on the Nore at Borris-in-Ossory and Kilbrickin, upstream and downstream of the confluences of the Delour and Whitehorse Rivers. There is also a gauge on the Nore at Derryduff, between these two confluences, which is operated by Laois County Council. The records for Kilbrickin gauge showed a strong peak at 08:15 on the 31st March 2008, and the estimated return period, using the Weibull formula is 2.94 years. The Borris-in-Ossory gauge had a smaller peak at 03:30 and a calculated return period of 2.12 years. The Delour River had a strong peak at 02:00 with an estimated return period in the region of 6 to 8 years. The peak levels at Kilbrickin show a strong correlation with the peaks on the Delour. This would appear to indicate that a significant contribution to floods in the Nore at Kilbrickin is made by the Delour River. The main flows in the Whitehorse Rivers originate close to the Delour catchment, and are likely to be driven by the same rainfall events.

Met Eireann have major weather stations at Birr and Kilkenny. Birr recorded 20mm of rain on the 30th May, 2008, while Kilkenny recorded 24mm. The monthly weather summary for March reported that rainfall was quite high toward the end of the month. These rainfall amounts do not represent extreme events.

It may be concluded that the event causing the flooding in Mountrath had a return period in excess of 3 years, and possibly as high as 8 years. This would not be considered a major event.

Issues Identified and Options

Issues identified

1. The photographic survey of the Whitehorse River, together with the long-section provided by Laois County Council based on trash marks do not identify any single constriction leading to increased flood levels.
2. The bridges and weirs in the town do not appear to have interfered significantly with flow. The weirs all drowned out and the bridges all had extra capacity in them.
3. The sewer pipe under the main road bridge did not appear to cause an increase in water level based on the information available, however it does pose a risk of blockage in a flood.
4. The main sewer pipe feeding the waste water treatment plant appears to form a constriction. The presence of cobbles in the bed at this location indicates that the river loses energy here.
5. There are indications that the channel capacity has decreased significantly over a long period of time through accumulation and naturalisation of silt and possibly also through encroachment. The conveyance capacity is also significantly reduced at a number of locations by trees growing in the river bed and occupying more than half of the cross section.
6. There has been some significant encroachment on the flood plain at a number of locations within the environs of Mountrath. The individual encroachments may not have had any significant impacts, but in combination the reduction in conveyance capacity would be a concern, especially for larger flood events.
7. The area that flooded on 31st March 2008 forms a small, enclosed basin that is lower than surrounding areas and does not have a direct outlet.
8. A small stream enters the river at this point, through a small stone box culvert. This stream may overflow and flow down a road into the area that flooded on this occasion.

Options

In general reducing the risk of flooding from rivers may be managed by increasing the capacity of rivers and other watercourses to transport water, or by preventing water from entering vulnerable areas with walls or embankments. There are also a number of non-structural measures that may be implemented in suitable situations, however these are not applicable in this case due to the fast onset of flooding.

Flood Risk Assessment and Management Study

The OPW are currently carrying out a national preliminary flood risk assessment under the EU Floods Directive. This will identify areas at significant risk of flooding, for which further studies will be carried out on a catchment basis to identify the actual level of risk and appropriate management and mitigation measures required. The flood record from Mountrath will form part of the assessment of the Nore catchment.

Pre-feasibility Study

Initial indications from the hydrometric record indicate a relatively low return period for the flood event experienced in Mountrath in March 2008. This suggests that interim measures should be considered to mitigate the existing risk, as it will be some time before the catchment level flood risk assessment study is completed. As an alternative, resources might be provided to the local authority to expedite a pre-feasibility study for Mountrath, in line with the specifications developed for similar studies. The extent of the benefiting land envelope through Mountrath would appear to justify this option, as additional flood mechanisms may be present which were not activated during the recent flood.

Interim measures

The flood event of the 31st March might have been prevented from entering the properties affected by enhancing the conveyance of the existing channel and / or by erecting a flood defence embankment at the entrance to the GAA grounds.

Protection of vulnerable areas

The Patrick Street area might be protected from flooding by increasing the ground level at the points where water can enter at the entrance to the GAA grounds and from the small stream to the rear. A sump could also be installed at a convenient location to facilitate pumping. The small stream that enters the Whitehorse River at the entrance to the GAA could potentially flood into this area, with an increased residual risk. Detailed analysis of the risk of floods from this small stream would be required to fully evaluate this option.

Vegetation management

The conveyance of the channel through Mountrath might be increased by management of vegetation in the channel through Mountrath to a point downstream of the wastewater treatment plant involving removing or significantly trimming back trees growing in the channel as these cause a large reduction in conveyance. This work would require screening under Article 6 of the Habitats Directive. If a significant effect on a conservation objective of the SAC were identified, an assessment of all available flood mitigation options and a full appropriate assessment would be required.

Channel maintenance

The conveyance of the channel through Mountrath might be increased by maintenance of the channel through Mountrath to remove accumulations of silt and obstructions on the flood plain close to the river bank. The levels provided by Laois County Council as the flood profile for the river do not identify any specific reaches where specific benefit would be derived from this channel maintenance with the exception of the area immediately upstream of the main road bridge. The

maintenance of this river would require screening for an appropriate assessment under Article 6 of the Habitats Directive. If a priority habitat is affected, more stringent requirements arise.

These interim measures would mitigate flood events of the magnitude of the recent event, however there would still be a significant risk if a larger event occurred. The measures would not substantially increase the risk of flooding, and this would have to be clearly explained in any public consultation process.

Flood Maps

This report and the information provided by Laois County Council will be submitted to the Flood Maps website in September.