

Broadford Priority Area for Action

Desk Study

(AFA0030)



Upstream of Scott's Bridge, February 2019

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Table of Contents

| | |
|--|----|
| Acknowledgements..... | 4 |
| Summary | 4 |
| 1 Background | 5 |
| 2 Receptor information..... | 8 |
| 2.1 Overview table | 9 |
| 2.2 Hydrochemistry..... | 10 |
| 2.3 Additional Information..... | 12 |
| 3 Significant pressures | 11 |
| 3.1 Initial EPA characterisation | 11 |
| 3.2 Conclusion on the Significant Pressures: | 11 |
| 4 Pathways information (diffuse pollution) | 12 |
| 5 Interim conclusions on the PAA..... | 13 |
| 6 Workplan..... | 13 |
| 6.1 EPA further characterisation actions | 13 |
| 6.2 Local Catchment Assessment..... | 14 |
| 7 Review of possible mitigation options..... | 15 |
| 8 Communications | 15 |
| Appendices..... | 16 |

List of Figures

| | |
|---|----|
| 1-1: Broadford Priority Area for Action Ecological Status (2010-2015) | 7 |
| 1-2: Broadford Priority Area for Action WFD Risk Map | 7 |
| 2-3: Biological monitoring results for Scotts Bridge, Broadford_010 | 11 |
| 2-4: Biological monitoring results at U/S confluence with Broadford. | 11 |
| 2-5: Q assessment on Broadford 10 (January 2017) | 12 |

List of Tables

| | |
|--|----|
| 1-1: Background information on the Broadford PAA | 6 |
| 1-2: Summary table of the waterbody in the Broadford PAA | 8 |
| 1-3 Monitoring point locations in the Priority Area for Action | 8 |
| 2-2-1: Receptor information for Broadford PAA | 9 |
| 3.1: Initial EPA characterisation | 12 |
| 6-1: EPA further characterisation actions | 14 |

Acknowledgements

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Data attribution

The following data sources were consulted in the preparation of this report:

Catchment boundaries, waterbodies and areas for action: EPA (2018)

Bedrock Unit: GSI (2008)

Aquifer Category: GSI (2015)

Groundwater body: EPA Catchments Unit (2018)

Soils & Subsoils Maps: Teagasc-EPA (2015)

IFS Soils: EPA (2006)

Susceptibility and Pollution Impact Potential Maps: EPA (2018)

WFD waterbody status: EPA (2018)

Pollution Impact Potential Maps: EPA (2016)

Date of completion of this desk study

Document conclusions are based on data collated on or before **30th April 2019**

Summary

The Upper Broadford River is locally named the Glenomra River. The eastern tributaries rise in two mountain ranges Glenvagalliagh and Lackareagh. This river flows into the Broadford river downstream which flows into Doon Lake. The Ahaclare River flows from Doon Lake to the Owenogarney River. This river system eventually flows into the Shannon Estuary at Bunratty. The area around the Broadford River is very scenic and includes the East Clare Way. This catchment is at “Poor status” under the EU Water Framework Directive and has been prioritised for further action.

The Broadford River contains three EPA waterbodies:

- Broadford_010
- Broadford_020
- Broadford_030

However, only the Broadford_010 has been designated as a PAA. The Broadford_20 has consistently been at High status and the Broadford_30 is at Good status.

The Broadford_010 is at “Poor status” under the EU Water Framework Directive and has been prioritised for further action.

Macroinvertebrates are driving the Poor Status in this catchment.

The soils and geology in this area indicate potential for nitrogen, ammonia and phosphorus loss. However, concentrations of these nutrients are low at the catchment outlet.

In January 2017, Clare County Council hired a consultant to carry out biological assessment at two sites upstream of the EPA WFD monitoring point. Results indicated unpolluted conditions at both sites assessed (Q4 and Q 4/5). This confirms that the water quality impact on Broadford_010 is confined to a 1km stretch upstream of Scotts Bridge. This area should form the main focus of the field walks/assessments. The soils in this focus area are mainly well-drained with some peat. The land use is mainly Agriculture and Woodland. As nutrients are low, the field assessment should focus on sediment and hydromorphology.

The LA Waters Team for the Southwest Region will undertake local catchment assessments in the Broadford PAA to identify the significant source/s of pollutants here, undertaking stream walks and assessing water quality to narrow the focus for further action. We will work with the relevant bodies to try to develop suitable measures to break the pathways for pollutant transfer to the river.

EPA characterisation information from the WFD App lists hydromorphology as the significant pressure in this waterbody.

Recommended Actions:

Undertake a stream walk upstream of WFD operational monitoring point at Scotts’ Bridge. Note sources of sediment from land drainage. Note siltation level and type. Where possible, undertake SSIS upstream and downstream of any point sources. Establish if land drainage is contributing to siltation at Scotts’ Bridge. Assess during wet conditions when sediment is mobilised.

1 Background

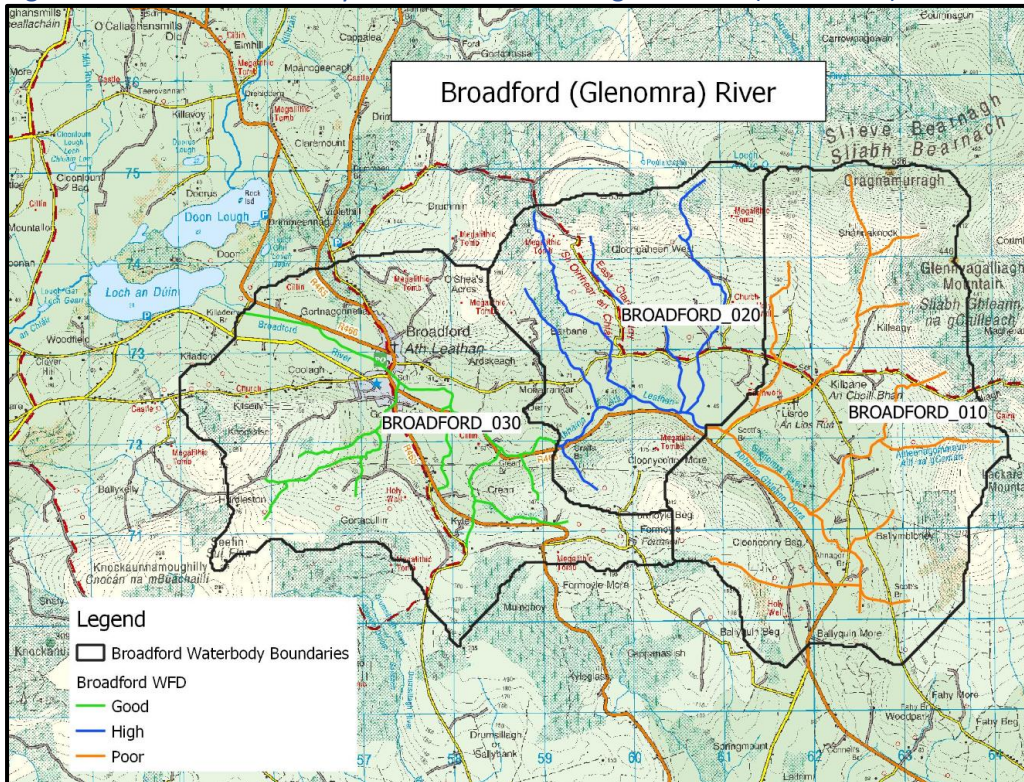
Table 1-1: Background information on the Broadford PAA

| Priority Area for Action | Catchment Number | Catchment Name | Sub catchment | Region | Local Authority |
|--------------------------|------------------|-----------------------|--------------------------|-----------|-----------------|
| Broadford | 27 | Shannon Estuary North | 27_13 Owenogarney_SC_010 | Southwest | Clare |

| Priority Area for Action | No. of At Risk WBs | No. of Review WBs | No. of dRBMP Prioritised WBs | No of WBs for Status Improvement: | | |
|--------------------------|--------------------|-------------------|------------------------------|-----------------------------------|------|-------------|
| | | | | 2021 | 2027 | Beyond 2027 |
| Broadford | 1 | 0 | 1 | 0 | 1 | 0 |

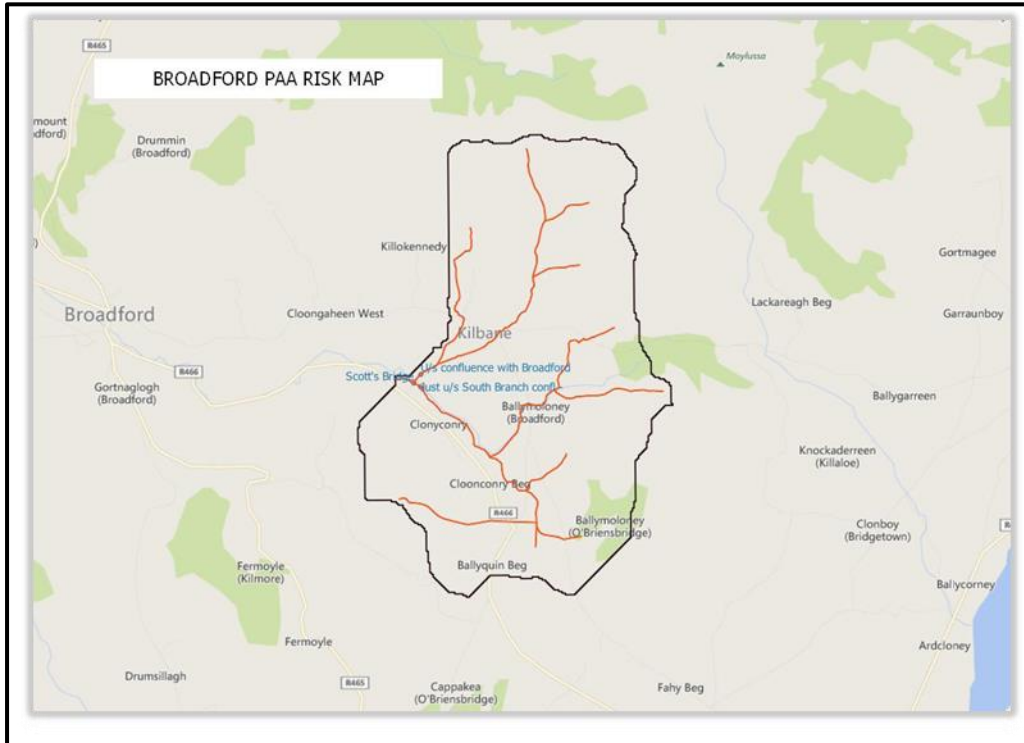
| | |
|-----------------------------|---|
| Reason for selection | <ul style="list-style-type: none"> • Building on existing work completed by Clare County Council. • Manageable area: Q-scores previously collected by Clare County Council on inputting tributaries will narrow the scope of work. • One deteriorated waterbody. |
|-----------------------------|---|

Figure 1.1: Broadford Priority Area for Action Ecological Status (2010-2015).



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Figure 1.2: Broadford Priority Area for Action WFD Risk Map



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Table 1-2: Summary table of the waterbody in the Broadford PAA (local river names in parentheses)

| Water body Code | Water body Name | Risk | Objective | Ecological Status | | | Pressures | | |
|----------------------------------|-----------------------------|----------------|-----------|-------------------|------|------|------------------|----------------|------------|
| | | | | 2009 | 2012 | 2015 | Category | Subcategory | Sig? (Y/N) |
| IE_SH_27B020300 (RS27B020500) | Broadford_010 (Glenomra) | <i>At Risk</i> | Good | Moderate | Poor | Poor | Hydro-morphology | Channelisation | Y |

Source: EPA WFD app

Table 1.3: Monitoring point locations in the Priority Area for Action

| Waterbody | Monitoring Point Code | Name | Type | Comments |
|---------------|-----------------------|-------------------------------|---------------|--------------------------------|
| Broadford_010 | RS27B020500 | Scotts Bridge | Operational | Includes Q and chemistry data. |
| | RS27K050300 | U/s confluence with Broadford | Investigative | Q only. |

2 Receptor information

2.1 Receptor Overview

Table 2-2-1: Receptor information for Broadford PAA

| | Figures Tables | Broadford_010 | | Broadford_020 | Broadford_030 | |
|---|--|-------------------------------|---|-----------------------------------|--------------------------------------|-----|
| Risk Category | | <i>At Risk</i> | | <i>Not At Risk</i> | <i>Not At Risk</i> | |
| Biological Status 2010-2015 trends in Q values 2010-2015 Q value data Fish status (where rel) | 1.2 | RS27B020500 Scotts Bridge | RS27K050300 u/s confluence with Broadford | RS27B020600 Near Graffa Bridge | RS27B020800 Bridge u/s Doon Lough | |
| | Y | Poor (High status in 2014) | High | High | Good | |
| Hydrochemistry Data | | | | | | |
| Ortho-P (mg/l P) | Baseline | 0.007 | No data | No data | 0.008 | |
| | indicative quality | High | No data | No data | High | |
| | Trends - significant? | No | No data | No data | No | |
| | Dist to threshold | Far | No data | No data | Far | |
| NH4-N (mg/l N) | Baseline | 0.038 | No data | No data | 0.021 | |
| | indicative quality | High | No data | No data | High | |
| | Trends - significant? | No | No data | No data | No | |
| | Dist to threshold | Far | No data | No data | Far | |
| TON (mg/l N) | Baseline | 0.985 | No data | No data | 1.072 | |
| | indicative quality | Good | No data | No data | Good | |
| | Trends - significant? | No | No data | No data | No | |
| | Dist to threshold | Far | No data | No data | Far | |
| Supporting Conditions Chemical conditions? Oxygenation Conditions Acidification Conditions | | Pass | | Good | Pass | |
| | Hydromorphology | | | | | |
| | RHAT score Evidence of Arterial drainage | | N/A | N/A | N/A | N/A |

| | Figures Tables | Broadford_010 | | Broadford_020 | Broadford_030 |
|---|----------------|---|-------------|---------------|---------------|
| Monitoring Point Code | | RS27B020500 | RS27K050300 | RS27B020600 | RS27B020800 |
| Ecological Status (2010–2015) | | Poor | | High | Good |
| Trends (2010-2015) | | Fluctuating | | Stable | Stable |
| Protected Areas | | No | | No | No |
| WFD Objective | | Good | | Good | Good |
| EPA biologist notes (if any) | | <ul style="list-style-type: none"> •Inverts driving status, fish status good. •Monitoring point at Scott's Bridge was High status until 1996, then dropped and fluctuates between Bad, Poor and Moderate. •Siltation Heavy & Loose | N/A | N/A | N/A |
| Significant issue/impact for receptor (e.g. PO ₄) | | Macroinvertebrates | N/A | N/A | N/A |

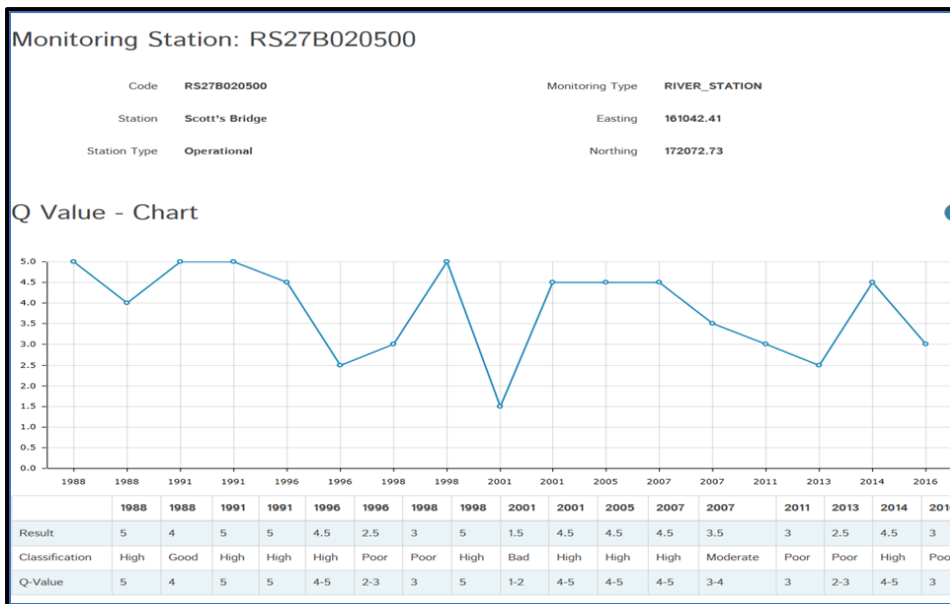


Figure 2.3: Biological monitoring results for Scotts' Bridge, Bradford_010

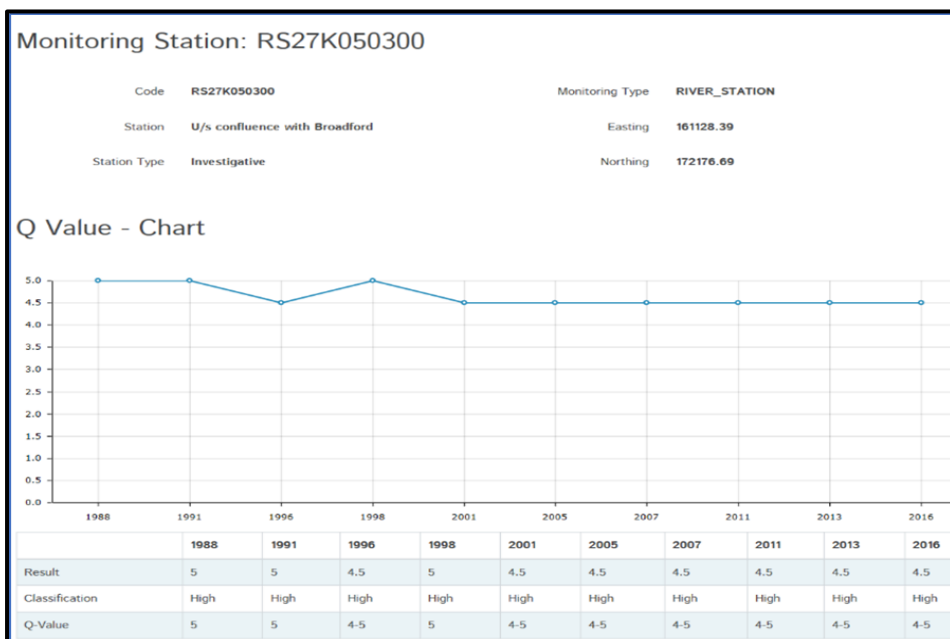


Figure 2.4: Biological monitoring results at U/S confluence with Bradford.

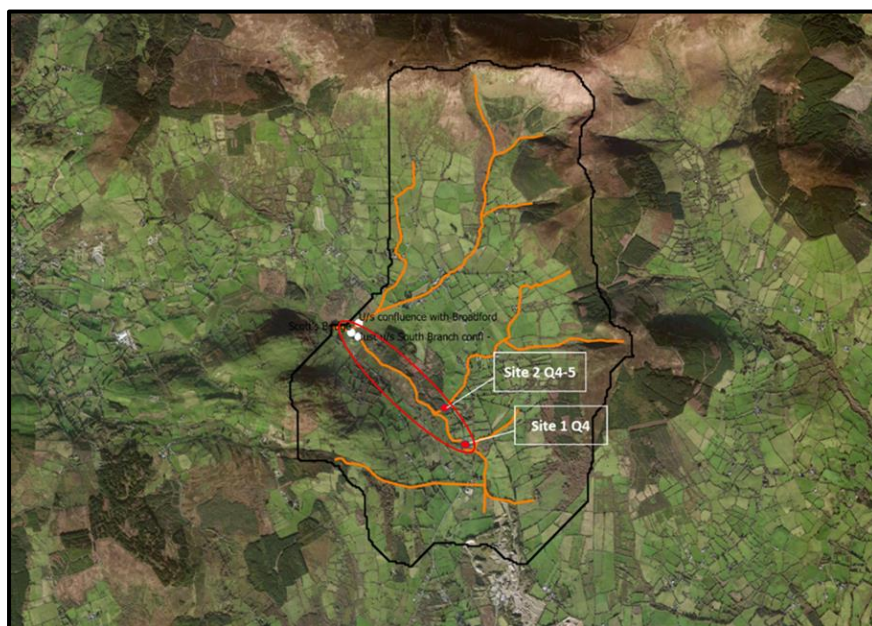
2.2 Hydrochemistry

The WFD operational station at Scott's Bridge is monitored for nutrients orthophosphate, ammonia and total oxidised nitrogen. Results are consistently below the relevant Good Status environmental quality standards, indicating that nutrients are not the significant issue in this waterbody.

2.3 Additional Information

In January 2017, Clare County Council hired a consultant (Conservation Services) to carry out biological assessment at two sites upstream of the EPA WFD monitoring point at Scotts Bridge. Results indicated unpolluted conditions at both sites assessed (Q4 and Q 4/5) (see figure 2.5). This information indicates either that the significant pressure/s driving status on Broadford 10 are located within a 1km stretch upstream of Scott's Bridge (shown as a red oval in the map below) or that sediment deposition has occurred along this stretch.

Figure 2.5: Q assessment on Broadford 10 (January 2017)



3 Significant pressures

3.1 Initial EPA characterisation

Table 3-1: Initial EPA characterisation

| Water body Name | Id | Category | Sub Category | Name | Significant? | Pressure & Impact details |
|----------------------|------------|------------------|----------------|------|--------------|---------------------------|
| Broadford_010 | WBP0002043 | Hydro-morphology | Channelisation | N/A | Yes | Invertebrates |

3.2 Conclusion on the Significant Pressures:

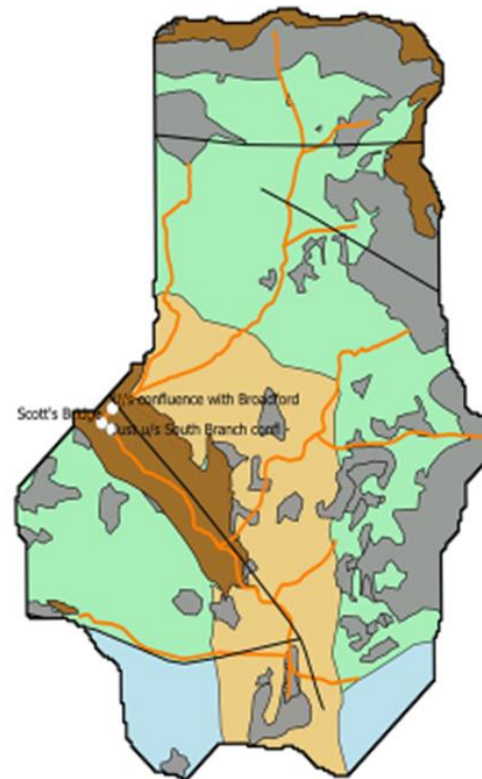
Overall, the Broadford PAA is At Risk due to the following:

Deterioration in biological status at Scott's Bridge on Broadford_010 (deteriorated from High in 2014 to Poor in 2016). Land use and soil type indicate that the significant issue is sediment. The significant pressure is hydromorphology - channelisation: evidence of deepening and straightening.

4 Pathways information (diffuse pollution)

4.1 Conceptual Model Development

- Compartment 1**
Peat
Pathway: Overland flow of P and NH₃
- Compartment 2**
Poorly drained soil
Pathway: Overland flow of P
- Compartment 3**
Well drained soil
Poor Aquifer bedrock which is generally unproductive except for local zones.
Pathway: Shallow GW flow of N, likely P attenuation
- Compartment 4**
Well drained soil
Locally important aquifer moderately productive only in local areas
Pathway: Shallow GW flow of N, likely P attenuation
- Compartment 5**
Well drained soil
Locally Important Sand and Gravel Aquifer
Pathway: Shallow GW flow of N (Aquifer thickness 5-15m), likely P attenuation
- Fault Line:** likely enhanced GW flow



In terms of sediment sources, compartment 1 (peat) and possibly compartment 2 (poorly draining soils) are the primary focus for assessment. The impacted stretch of Broadford 10 flows mainly through compartment 1. The lands upstream of this stretch appear to be mainly well drained soils and would not be expected to be a source of sediment.

5 Interim conclusions on the PAA

The Upper Broadford River is locally named the Glenomra River. The eastern tributaries rise in two mountain ranges Glenvagalliagh and Lackareagh. This river flows into the Broadford river downstream which flows into Doon Lake.

Broadford_010

- *At Risk*
- Poor WDF Status (driven by macroinvertebrates only)
- Hydrochemistry is not the significant issue. Ortho-P and Ammonia are high indicative quality and TON is good indicative quality.
- Information from the WFD App indicates that sediment may be impacting on the biological status.
- The significant pressure is Hydromorphology

6 Workplan

6.1 EPA further characterisation actions

| Waterbody Name | Action | Description |
|----------------|---|---|
| Broadford_010 | IA5 Multiple Sources in defined rural area (1km) or waterbody or rural town | Walk along stretch of the Broadford_010 river water body between stations RS27B020300 and RS27B020500. Note point sources of sediment from land drainage. Note siltation and compete SSRS upstream and downstream of any point sources. Establish if land drainage is contributing to siltation at RS27B020500. |

Additional information requirements:

- Drainage works records to be requested from Clare County Council.
 - Determine whether the quarry discharge is within the PAA. If so, this may broaden the scope of the local catchment assessment.
-

6.2 Local Catchment Assessment

Field investigations to be undertaken at location outlined in yellow below as shown in figure 6.1.

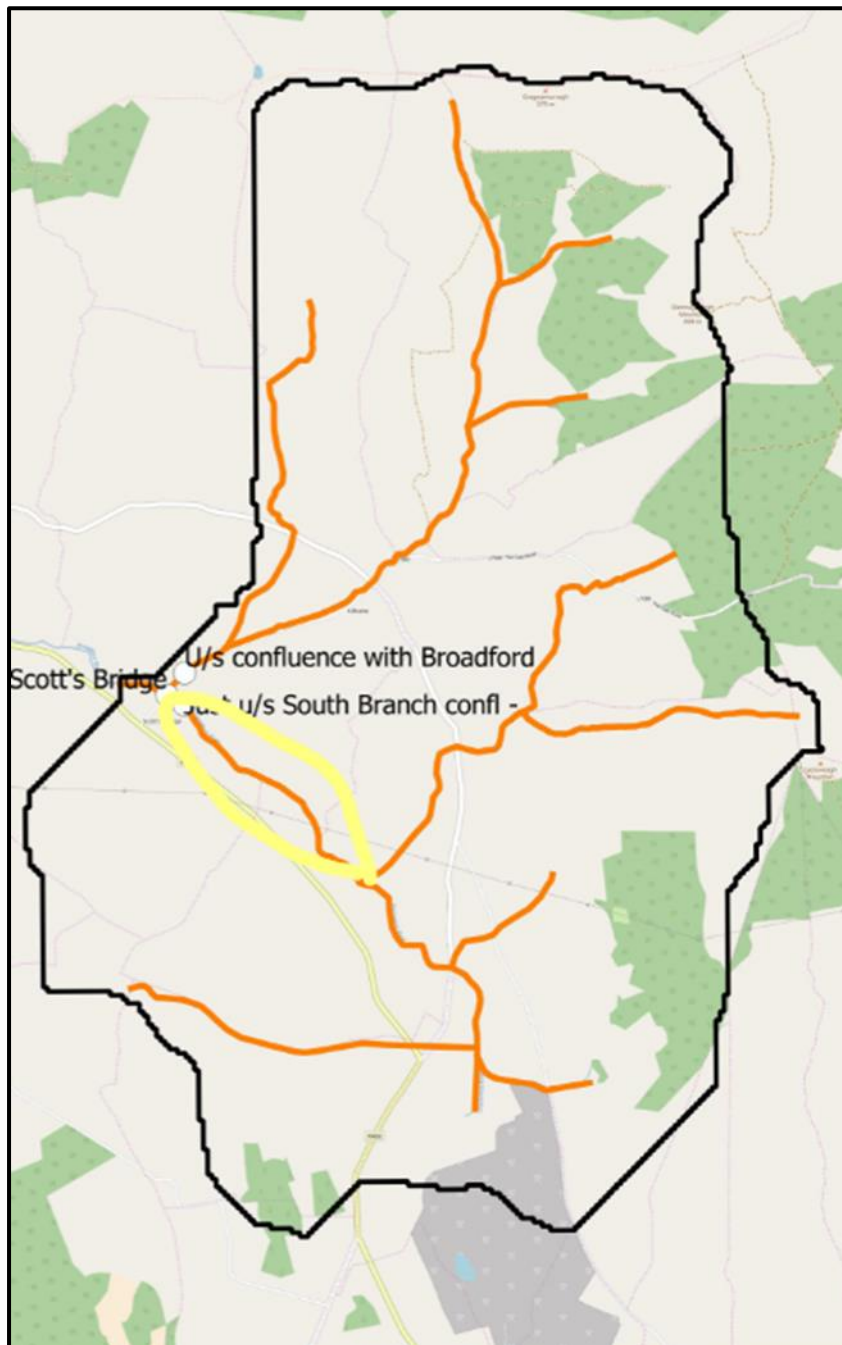


Figure 6.1 Area of focus for field investigation

If the quarry discharges within the PAA, undertake SSIS upstream and downstream of the discharge site and assess stream bed sediment to determine whether this facility is a potential significant pressure on the waterbody.

7 Review of possible mitigation options

Nutrients are not the significant issue in Broadford_010. Source control, pathway interception and mobilisation control are mitigation options that may be considered where sediment is a significant issue.

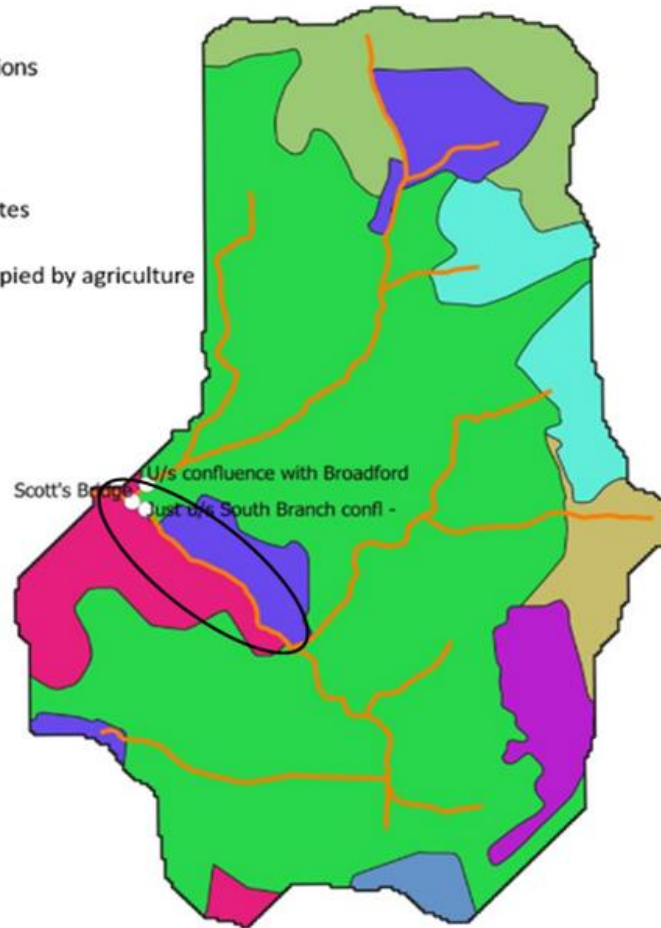
8 Communications

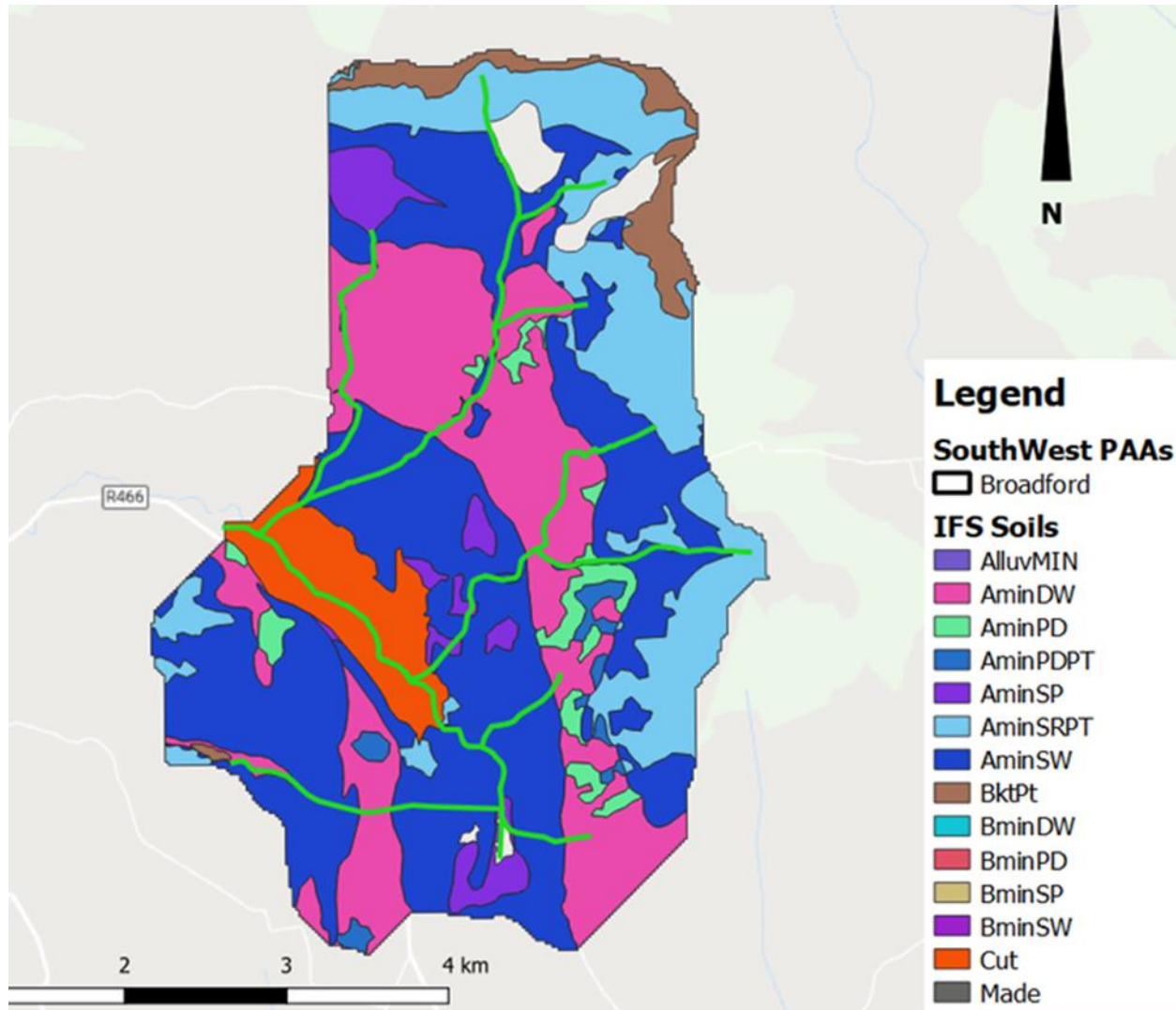
A public meeting was held in Kilbane on the 14th November 2018. There was a good attendance, ca. 25 people in addition to LAWPRO and ASSAP staff. There was a high level of engagement at the meeting with many issues arising. The main concerns at the meeting included: flooding, wastewater treatment and maintenance of the river.

Appendices

Legend

- broadford monitoring stations
- river
- Poor
- broadford corine
- 131 Mineral extraction sites
- 231 Pastures
- 243 Land principally occupied by agriculture
- 311 Broad leaved forest
- 312 Coniferous forest
- 322 Moors and heathland
- 324 Woodland shrub
- 412 Peat bogs

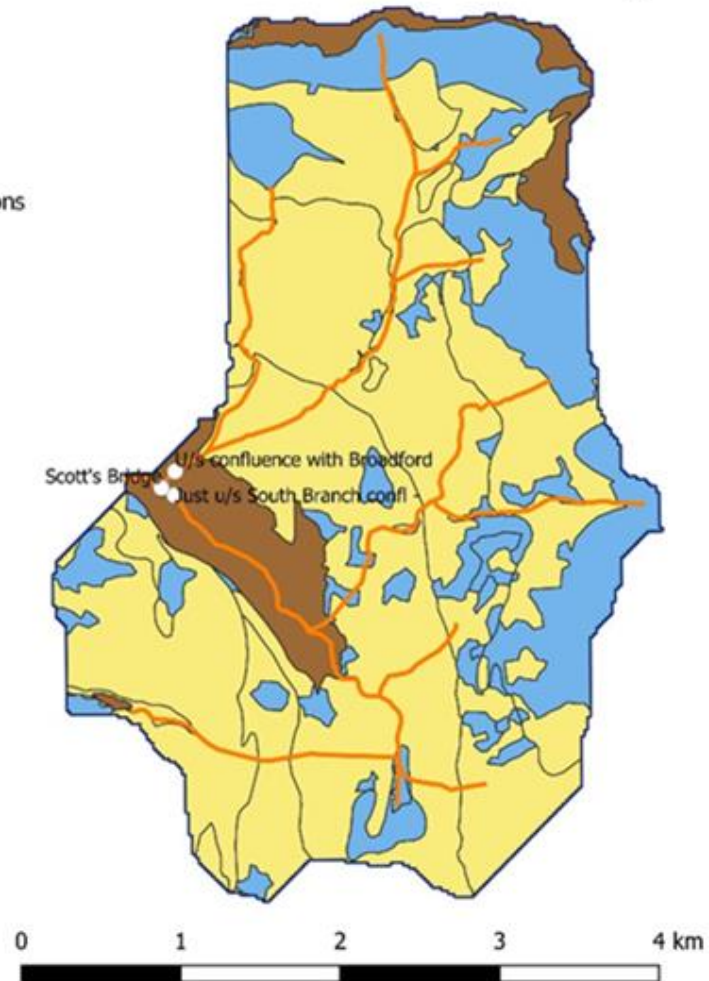




Broadford soils drainage

Legend

- broadford monitoring stations
- river
- Poor
- broadford wet dry
- Peat
- Poorly Drained
- Well Drained



Broadford bedrock aquifer map

Legend

○ broadford monitoring stations

river

— Poor

—

bedrock aquifer

■ Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones

■ Locally Important Sand/Gravel Aquifer

■ Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones



Broadford groundwater vulnerability

Legend

○ broadford monitoring stations

▭ WFD_AreasForAction

river

— Poor

VULNERABILITY

■ X

■ E

■ H

■ M

Scott's Bridge
U/s confluence with Broadford
Just u/s South Branch confl -

