

**Desk Top Assessment**  
**Clooneigh**  
**Priority Area for Action**  
**(AFA0053)**

**Version F01**

**7<sup>th</sup> November 2019**

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**Western Region**



### Acknowledgements

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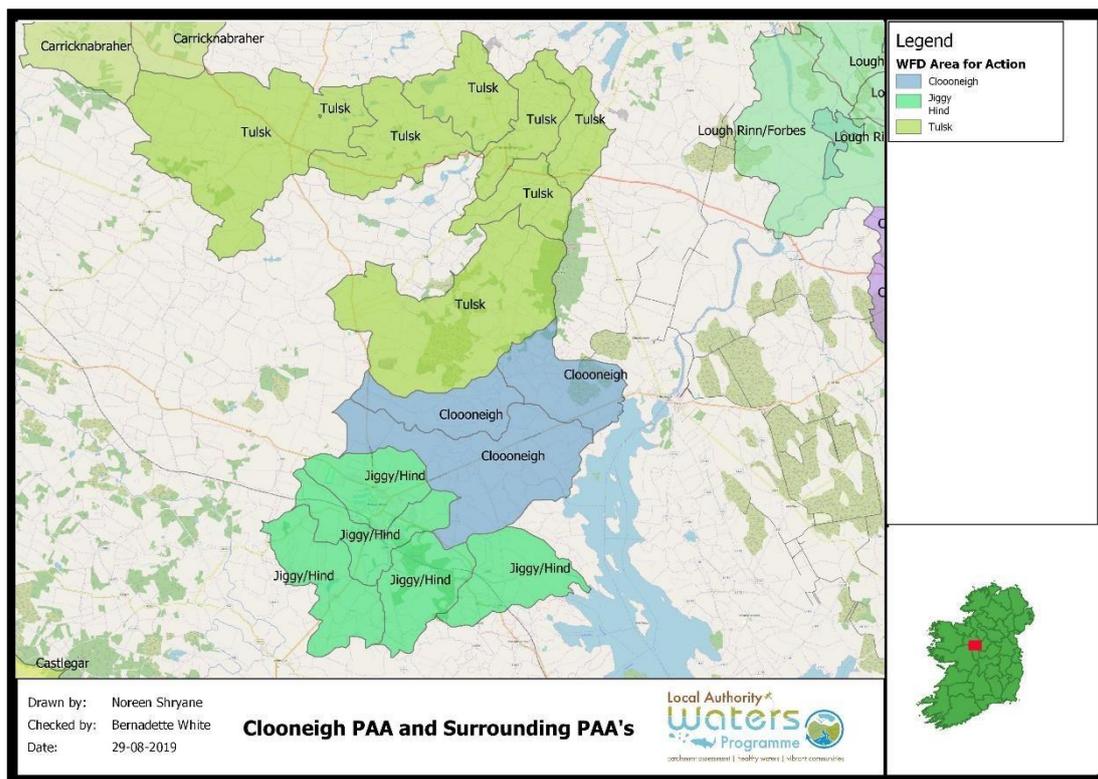
Appendix A - Protected Areas Within the PAA

# 1 Introduction

## 1.1 Background to the PAA

Clooneigh Priority Area for Action (PAA) is located north-east of Roscommon town. It covers the areas between Roscommon town and Lanesborough and includes the waterbodies Clooneigh\_010, Clooneigh\_020 and Keelcurragh\_010. The PAA is bordered to the north by Tusk PAA and to the south by the Jiggy/Hind PAA (**Figure 1**). All river waterbodies in the PAA flow into Lough Ree. Both Clooneigh\_010 and Clooneigh\_020 are *At Risk* while Keelcurragh\_010 is *At Review*. There are a number of European sites (SACs and SPAs) in the vicinity of the PAA, with Corbo Bog SAC (**002349**) entirely inside the PAA and Lough Ree SAC (**000440**) and SPA (**004064**) overlapping the PAA (**Figure 13**).

Agriculture was identified as the significant pressure on the Clooneigh\_010 and Clooneigh\_020 while Anthropogenic pressures were identified on the Keelcurragh\_010 at initial characterisation stage by the EPA.



**Figure 1** Clooneigh PAA and the Surrounding PAA's

A catchment assessment workshop was held in Castlebar on 26<sup>th</sup> to 28<sup>th</sup> April 2017. It was attended by representatives of local authorities (Mayo, Galway, Roscommon, Leitrim, Sligo), LAWCO, Irish Water, IFI, Forest Service, Coillte, NPWS, Teagasc, GSI, DAFM, Marine Institute and EPA. Based on the draft River Basin Management Plan priorities, a set of agreed principles and the local priorities of the workshop attendees, 34 areas were recommended for action in the Western Region, of which Clooneigh PAA was one. Clooneigh PAA was selected, for the following reasons:

- Manageable area to focus measures;
- Two potential 'quick wins';
- Two deteriorated water bodies and
- Headwaters flowing into Lough Ree.

**Table 1** summaries the risk classification, environmental objectives, ecological status, significant pressures (and sub-category) and local catchment assessment (LCA) action proposed. **Figure 2** and **Figure 3** illustrate the risk classification and status classification for the PAA. The LCA assigned to these waterbodies based on initial characterisation undertaken by the EPA is:

**Clooneigh\_010: IA7 Multiple Sources in Multiple Areas:** this stream is approximately 2km in length and it needs to be walked. It is a significant river for Inland Fisheries Ireland and is important for Lough Ree. It currently is at Moderate status with no chemistry data available. Pollution Potential impact maps show the potential critical source areas for agricultural diffuse nutrients in water bodies and their catchments. These maps rank the relative risk areas for diffuse phosphorus to surface water and diffuse nitrogen to surface and groundwater. The PIP maps indicate agriculture is unlikely so would indicate that this is point source or something has happened. Soils are free draining and mixed with some wet soils. There are some intensive farms and a slaughtering facility.

**Clooneigh\_020: IA7 Multiple Sources in Multiple Areas:** It is a significant river for Inland Fisheries Ireland and is important for Lough Ree. The farming enterprises are mixed in the catchment. There are two section 4s in the water body (Roxboro National School and Kiltewan Inn). Soils in the catchment appear to be free draining however this section was badly flooded in 2009.

**Keelcurragh\_010: IA3 Determination of Water Quality (unassigned waterbody):** The catchment is dominated by peat and poorly drained soils. Water quality sampling will be required to assign risk.

## 1.2 Information Sources Consulted

Several information sources were consulted during the preparation of the desk study for the Clooneigh PAA including:

- WFD web application – EPA characterisation data
- LAWPRO/ Roscommon County Council (MCC) workshop on 6<sup>th</sup> of November 2018 in Roscommon.
- LAWPRO/ASSAP meeting on 18<sup>th</sup> October 2018 in RCC, Roscommon.
- Satellite Imagery for analysing land use- <https://www.planet.com>
- [Google earth for time lapse aerial imagery](#)

**Table 1** Summary of waterbodies in the PAA

WB Name	WB Code	WB_Type	Risk	Status obj.	Ecological Status			Biological Status	Pressure Category	Pressure Subcategory	Significant Pressure	LCA Action
					2009	2012	2015	2017				
Clooneigh_010	IE_SH_26C060030	River	At Risk	Good	Good	Good	Moderate	Moderate	Agriculture	Agriculture	Yes	IA1 IA7
Clooneigh_020	IE_SH_26C060200	River	At Risk	Good	Good	Poor	Moderate	Poor	Agriculture	Agriculture	Yes	IA1 IA7
Keelcurragh_010	IE_SH_26K670950	River	Review	Good	Unassigned	Unassigned	Unassigned	Unassigned	Anthropogenic	Unknown	Yes	IA3

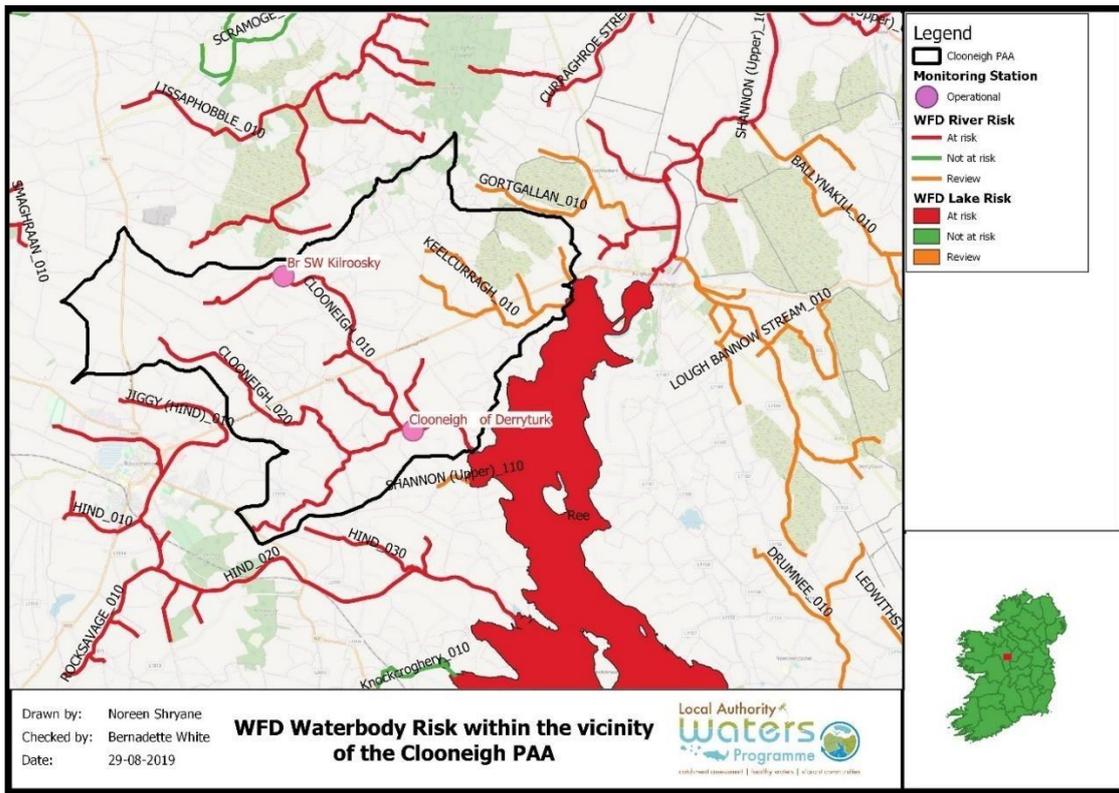


Figure 2 River and Lake Risk in the vicinity of the PAA

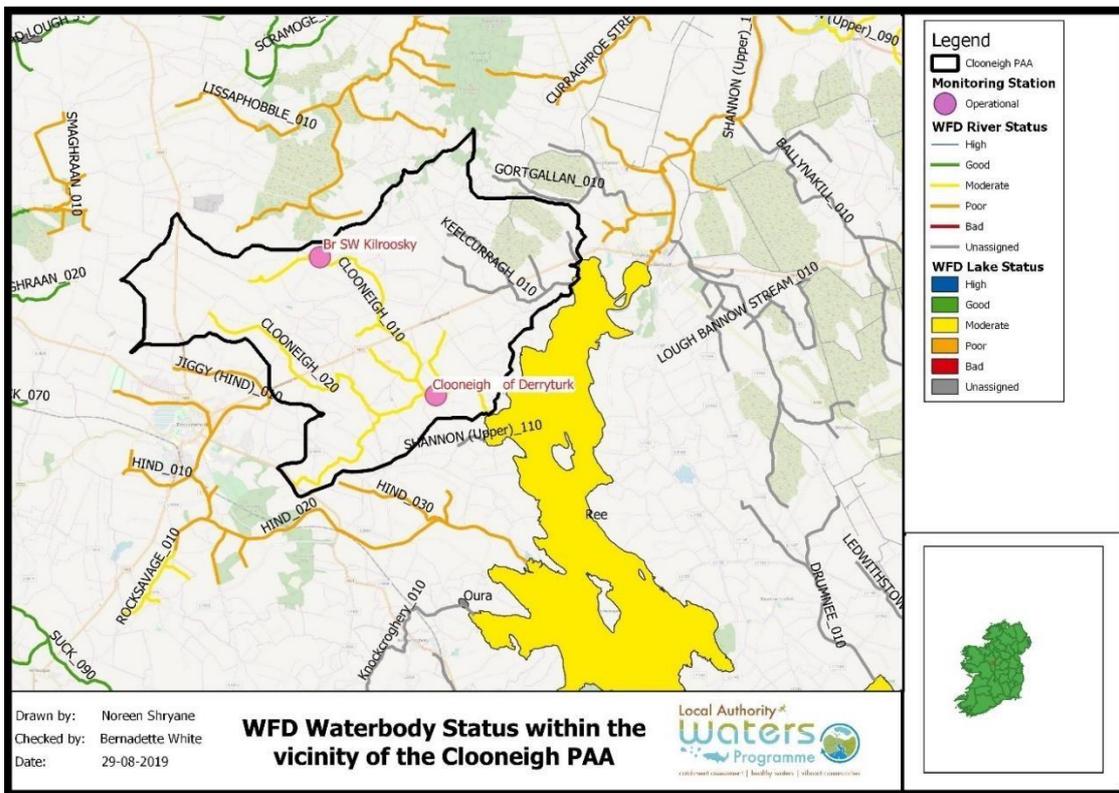


Figure 3 River and Lake Status in the vicinity of the PAA

## 2 Receptor information and assessment

### 2.1 Context and Setting

The Clooneigh\_010 rises in Derrane and the Clooneigh\_020 rises in Roxboro both in the West of the subcatchment and flow South-East into Lough Ree. The Keelcurragh\_010 river is not hydrologically linked to the other two rivers, but it also flows into Lough Ree.

There are 2 waterbodies in the PAA identified as *At Risk* (Clooneigh\_010 and Clooneigh\_020) and 1 waterbody (Keelcurragh\_010) identified as *Review* (**Figure 2** and **Figure 3**). There is little data available on the water quality of the Keelcurragh\_010 river water body as it is unassigned and not monitored by the EPA.

Clooneigh\_010 has one WFD operational monitoring point (BR SW Kilrooskey) which recently dropped from good to moderate status in 2015 and has stayed at moderate status in 2017 (**Table 1**). Whereas Clooneigh\_020 dropped from good to poor status in 2012 and recovered to moderate status in 2015 and fell to poor status again in 2017 (**Table 2**).

There is one operational monitoring point in Clooneigh\_020 (Clooneigh of Derryturk). There is currently no chemistry data for this monitoring point.

## 2.2 Receptor Information tables

**Table 2:** Outline of available monitoring and characterisation data for the waterbodies in the PAA

Waterbody		Clooneigh_010	Clooneigh_020	Keelcurragh_010
Risk Category		At risk	At risk	At Review
Monitoring station		Br SW Kilroosky	Clooneigh of Derryturk	Unassigned
Monitoring station type		Operational	Operational	
<b>Biological Status</b>				
Q values	2009	4		
	2010			
	2011	4	3	
	2012			
	2013			
	2014	3-4	3-4	
	2015			
	2016			
	2017	3-4	3	
<b>Water chemistry</b>				
Monitoring station		Br SW Kilroosky	Clooneigh of Derryturk	Unassigned
PO4+	2010	There is no chemical data available for this point	There is no chemical data available for this point	There is no chemical data available for this point
<b>Hydromorphology</b>				
HYMO RHAT Score		No data	No data	No data

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Waterbody	Clooneigh_010	Clooneigh_020	Keelcurragh_010
Evidence of Drainage (OPW scheme, drainage district or other)	No Evidence	No Evidence	No Evidence
Comments			
Conceptual model required (Y/N)	Y	Y	Y
<b>Ecological Status (2013 – 2015)</b>	Moderate	Poor	Unassigned
EPA Biologist comments	<p>2015: Ecological conditions were found to be unsatisfactory at both sites in September 2014 in this Lough Ree tributary. A decline in condition was noted at station 0030 "Clooneigh_010" while station 0200 "Clooneigh_020" improved slightly.</p> <p>2017: Ecological conditions were found to be unsatisfactory at both sites in September 2017 in this Lough Ree tributary. A decline in condition was noted at station 0200 to poor while station 0200 remained at moderate ecological condition.</p>		
Protected Areas	Corbo Bog SAC, Lough Ree SAC and Lough Ree is nutrient sensitive	Corbo Bog SAC, Lough Ree SAC and Lough Ree is nutrient sensitive	Corbo Bog SAC, Lough Ree SAC and Lough Ree is nutrient sensitive
WFD Objective	Good	Good	Good
Suspected Significant issue	Nutrient pollution <sup>1*</sup>	Ammonia and Sediment	Ammonia and Sediment

<sup>1</sup> Based on information available during the deskstudy

\*Specific nutrient is unknown as there is no monitoring data available.

### 3 Significant Pressures

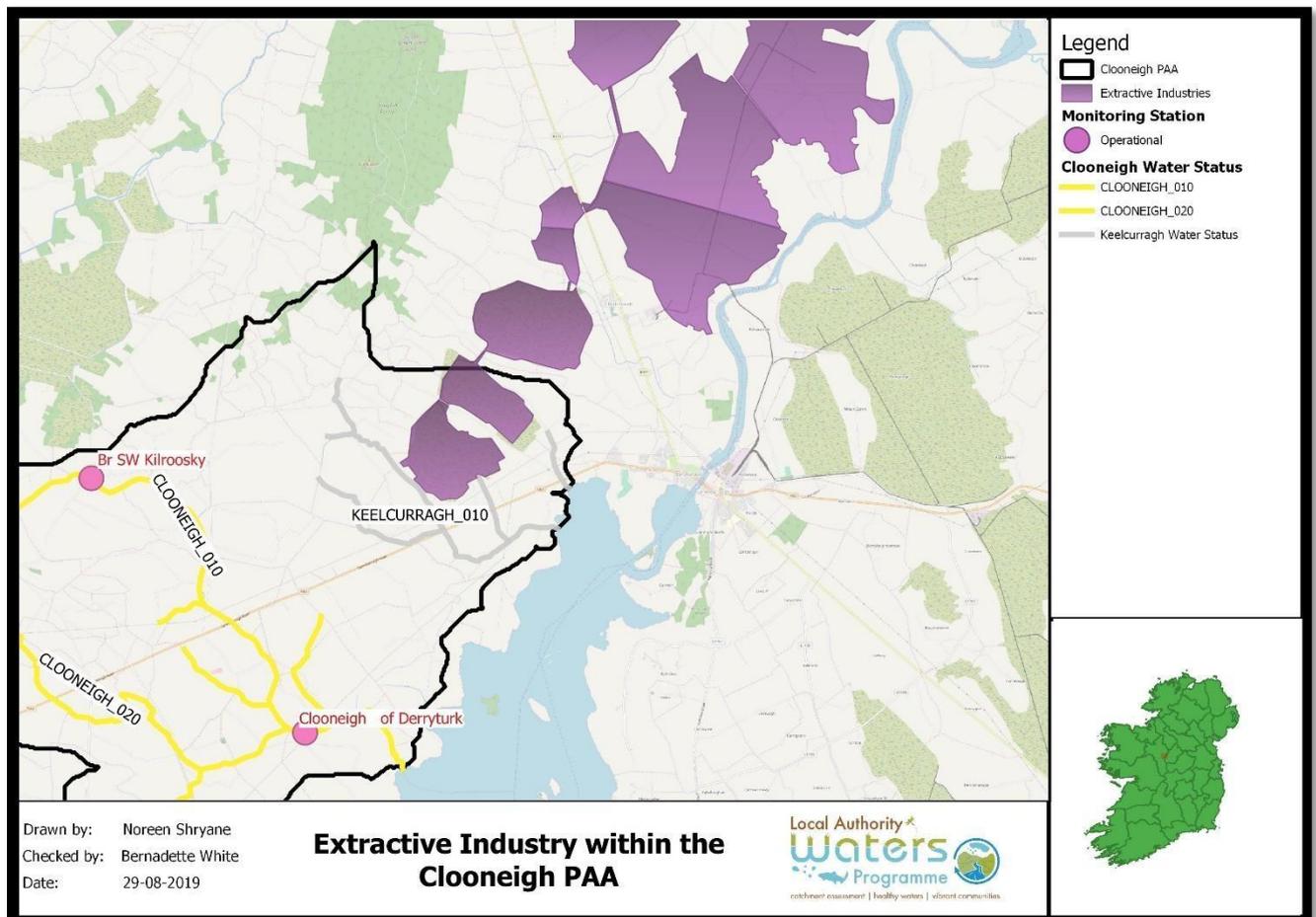
#### 3.1 Keelcurragh\_010

This river waterbody is unmonitored.

**Significant Pressure (Source: Initial characterisation in the WFD APP):** Anthropogenic Pressures

**Significant issue:** Unknown.

**Relevant pathways:** Though the significant issue(s) are not known, we do know that the waterbody is wholly contained in the poorly drained compartment. If the water quality in the waterbody is less than good, we can be confident that the pathway will be overland flow. The significant issues if present are therefore potentially phosphate, sediment and ammonia. There is a large area of peat extraction in this waterbody which is evident from aerial photography and which has been harvested industrially (**Figure 4**). The name of the extractive industry is Moher Bog (Part 2 of 3 Mid-Section) and Moher Bog (Part 3 of 3 South Section).



**Figure 4** Industrial peat extraction

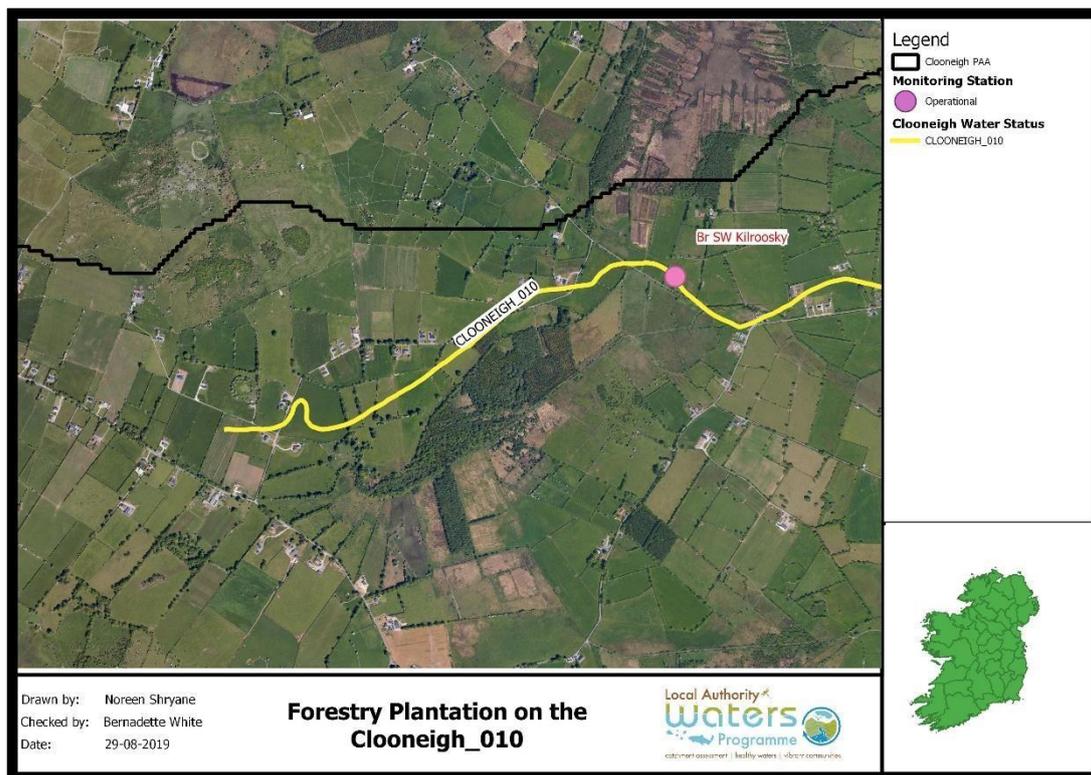
### 3.2 Clooneigh\_010

**Significant Pressure (Source: Initial characterisation in the WFD APP):** Agriculture.

**Significant issue:** Unknown.

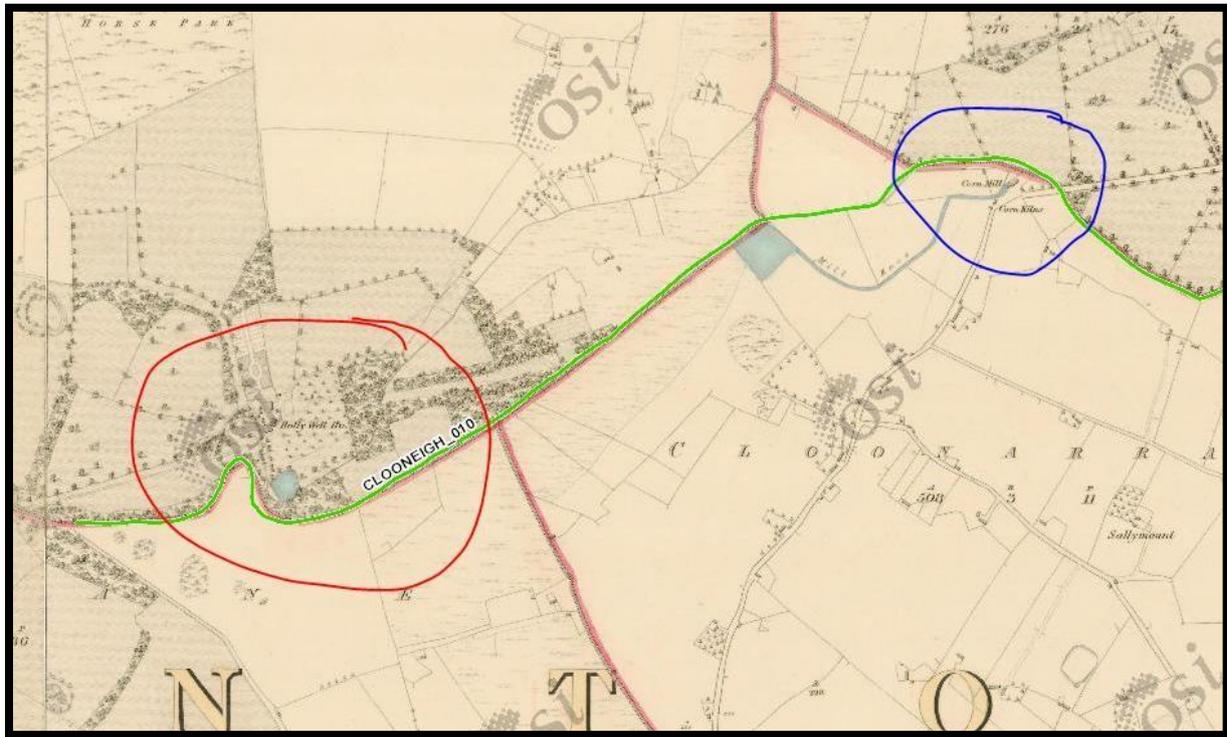
**Relevant pathways:** Sub soils within the waterbody are poorly drained where we expect overland flows to be dominant. However, the upper reaches of the waterbody are on the well-drained soils and there is a conduit karst area in this area of this waterbody. It may be that the waterbody rises from a spring that is feed from the well-drained section of the PAA. In which case the pathway would be ground water in the well-drained compartments.

There is an area of private forestry in the upper reaches of the waterbody which may be a pressure dependent upon activities in that plantation (**Figure 5**). However, the forest looks sparse and it contains 4.3ha Norway Spruce, 2.72ha of mature other broadleaves, 2.66ha of mixed mature forest (1998), 3,67ha of Sitka spruce and 2.76ha of Norway and Sitka spruce combined.



**Figure 5** Forestry in Clooneigh\_010

A review of historical six-inch mapping reveals a manor house (red) was located near the source of the Clooneigh\_010 and a corn mill and mill race (blue) was located downstream. There may be residual hydromorphology impacts from these features which may be seen during fieldwork, and these may also explain the straightness of the stream channel. This is less likely to be a significant pressure due to the recent acute drop in status.



**Figure 6** Historic features in Clooneigh\_010

### 3.3 Clooneigh\_020

**Significant Pressure (Source: Initial characterisation in the WFD APP):** Agriculture.

**Significant issue:** Unknown.

**Relevant pathways:** Clooneigh\_020 is at the bottom of the catchment, water reaching the monitoring point has passed through both the well-drained and poorly drained areas of the catchment. Pollutants could reach this point by either overland flow in the poorly drained areas or ground water flow in the karst well drained areas.

Clooneigh\_020 contains a large linear length of river that passes through several compartments and land uses. There are large areas of peat extraction along the southern boundary of the PAA along with approximately 62ha of private forestry. The initial characterisation undertaken by the EPA identified agriculture as the only significant pressure, however it is likely that the peat extraction is also having a significant impact due to the extent in the southern half of the PAA.

**Table 3** below outlines the pressures and their associated impacts from the Eden App.

**Table 3** Pressures and Impacts Table from the Eden App

Pressure Category Name	Pressure Category Name	Waterbody Name	Impact Assessment
Agriculture	Agriculture	CLOONEIGH_020	<p>The land-use in the catchment is predominantly high productivity pasture on grey-brown podzolic soils. The Source Load Apportionment Model (SLAMv204) indicates that pasture is likely responsible for 72% of the phosphate load and surface water phosphate PIP is high (rank 1 and 2) in the lower reaches of the sub basin.</p> <p>During the regional workshop, recent issues due to silage effluent in the river were reported.</p>
Agriculture	Agriculture	CLOONEIGH_010	<p>The land-use in the catchment is predominantly high productivity pasture on grey-brown podzolic soils. SLAMv204 indicates that pasture is likely responsible for 84% of the phosphate load and surface water phosphate PIP is high.</p> <p>During the local authority and regional workshops, it was reported that there are some intensive farms in the area.</p> <p>Priority river for IFI.</p>
Anthropogenic Pressures	Anthropogenic Pressures	KEELCURRAGH_010	<p>The assessment of the pressures in this water body cannot be undertaken until the completion of an Investigative Assessment.</p>

## 4 Pathway Information and analysis

### 4.1 Overview of Pathways in the PAA

Both drainage density and flashiness are low in the catchment. The eastern half of the catchment is covered by wet soils, a mixture of peat, peaty gleys and gleys, while the western half is dry, well-drained limestone till with some sandstone and shale till. There are also some small scattered areas where there is calcareous bedrock at the surface. Subsoils are mostly a combination of sandstone and shale till with peat in the east, and limestone till with some undifferentiated lake sediments and small amount of peat to the west, again with some areas of calcareous bedrock at the surface.

Subsoil permeability for the vast majority of the sub-catchment is moderate, with some low permeability over the gley soils and shallow areas (< 3m to bedrock) mostly to the east where there was some calcareous bedrock at the surface. There is regionally important karst (conduit) aquifer in the east and west, split by a band of locally important, moderately productive aquifer (LI) down the centre. Groundwater recharge is moderately high in the west where the Rkc aquifer aligns with the exposed calcareous bedrock. This area also ranges from high to extreme for groundwater vulnerability, while central areas range from low to moderate and the east rises back to high again over the Rkc aquifer. There are two EPA Groundwater Zones of Contribution that cross the sub-catchment boundary, Rockfield Springs at the western border and Ballyleague at the eastern border.

Potential pathways again split the sub-catchment into two halves. There is high near surface phosphate susceptibility in the east where the soils are wet and overland flow is the pathway. To the west (and to a lesser extent) there is moderate sub surface nitrate susceptibility which rises to very high for a small proportion that aligns with the exposed calcareous bedrock and the areas of higher groundwater vulnerability and recharge.

**Table 4** presents the pathways conceptual model for the PAA.

## 4.2 Pathways Conceptual Model

**Table 4** Main pathways identified within each compartment in the Clooneigh PAA

		<b>Compartment 1 (Regional conduit)</b>		<b>Compartment 2 (locally productive in local zones)</b>	
		<b>Poorly drained</b>	<b>Well drained</b>	<b>Poorly drained</b>	<b>Well drained</b>
<b>Pathway Info</b>	<b>Direct (e.g. pipe)</b>				
	<b>Aquifer</b>	Regionally important (Ri) conduit karst		Locally important (Li)	
	<b>Topography</b>	Peat and poorly drained, wet	Well drained	Peat and poorly drained, wet	Well drained
	<b>Soil</b>	Moderate permeability subsoil and overlain by poorly drained gley soil	Moderate permeability subsoil overlain by well-drained soil	Low permeability subsoil	Moderate permeability subsoil and overlain by well-drained soil
	<b>Subsoil</b>				
	<b>Subsoil K</b>	Mostly moderate with some low areas	Moderate with some <3m DTB	Moderate to low	Moderate
	<b>Rock Unit</b>	Pure bedded limestone <b>(Figure 10)</b>		Dinantian Upper Impure Limestones <b>(Figure 10)</b>	
	<b>Groundwater vulnerability</b>	Large areas of high with some areas medium <b>(Figure 11 Groundwater Vulnerability within the PAA)</b>	Extreme with some X extreme <b>(Figure 11 Groundwater Vulnerability within the PAA)</b>	Mixed, moderate and low common some areas of high <b>(Figure 11 Groundwater Vulnerability within the PAA)</b>	Moderate and high <b>(Figure 11 Groundwater Vulnerability within the PAA)</b>
	<b>PO4 Susceptibility</b>				
	<b>NO3 susceptibility</b>				
	<b>PO4 PIP</b>	High in many areas <b>(Figure 8)</b>	Low <b>(Figure 8)</b>	High <b>(Figure 8)</b>	Low with some small areas high <b>(Figure 8)</b>
	<b>NO3 PIP</b>	Low	Some high areas mostly moderate	Low	Medium
<b>Flowpaths</b>	Overland near surface flow paths	Subsurface pathways	Overland near surface flow paths	Subsurface pathways	
<b>Location of Monitoring Point</b>	Monitoring point for Clooneigh_010 (Br SW Kilroosky) is at boundary between this compartment and compartment 2. Clooneigh_020 monitoring point (Clooneigh of Derryturk) is within this compartment but is at the lower end of the catchment and is	Monitoring point for Clooneigh_020 is in this compartment but is downstream of all other compartments.			

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	<b>Compartment 1 (Regional conduit)</b>		<b>Compartment 2 (locally productive in local zones)</b>	
	<b>Poorly drained</b>	<b>Well drained</b>	<b>Poorly drained</b>	<b>Well drained</b>
	therefore influenced by all compartments.			
<b>Significant pressures</b>	Agriculture	Agriculture	Agriculture	Agriculture

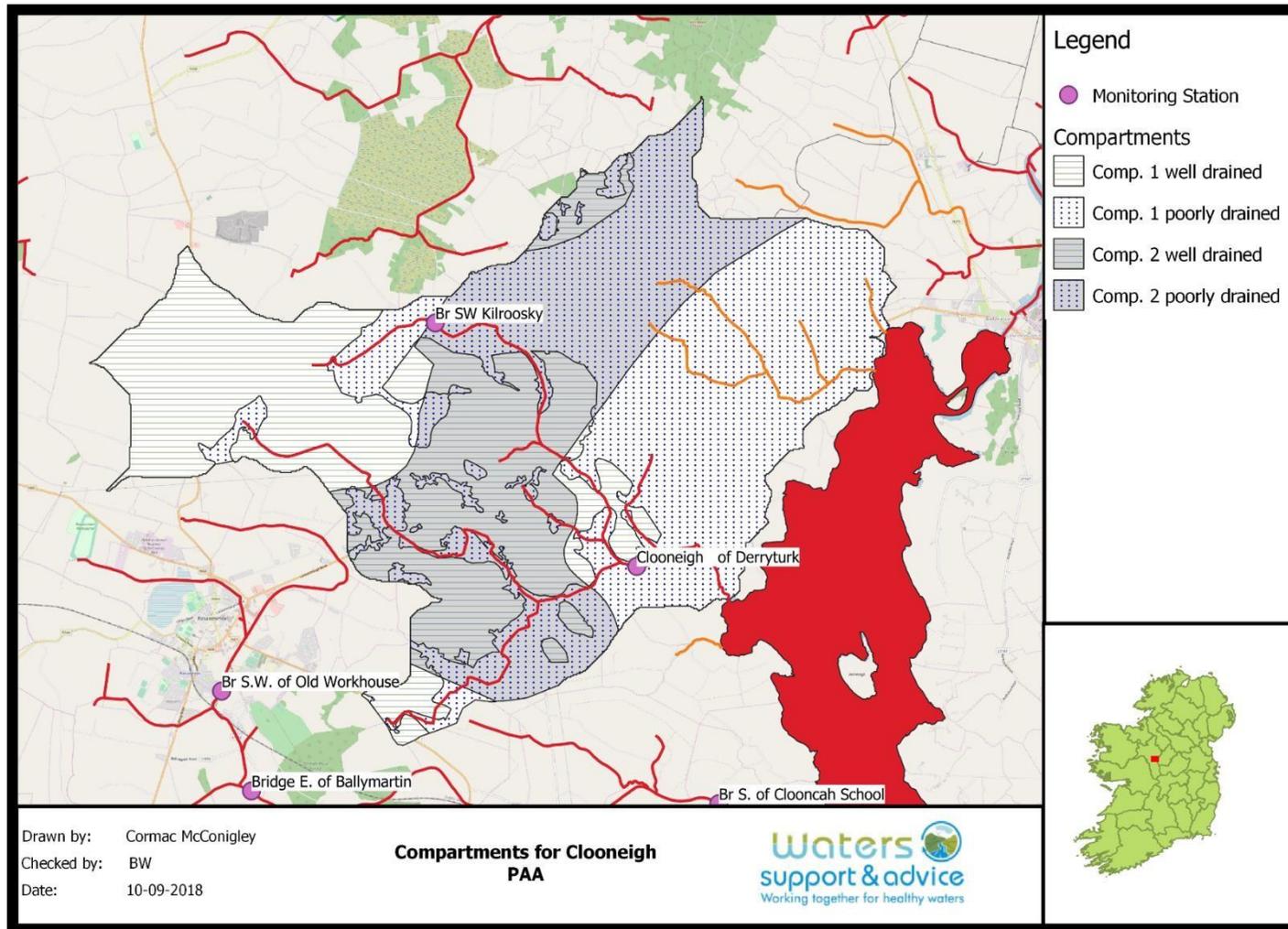


Figure 7 Compartments in the conceptual model

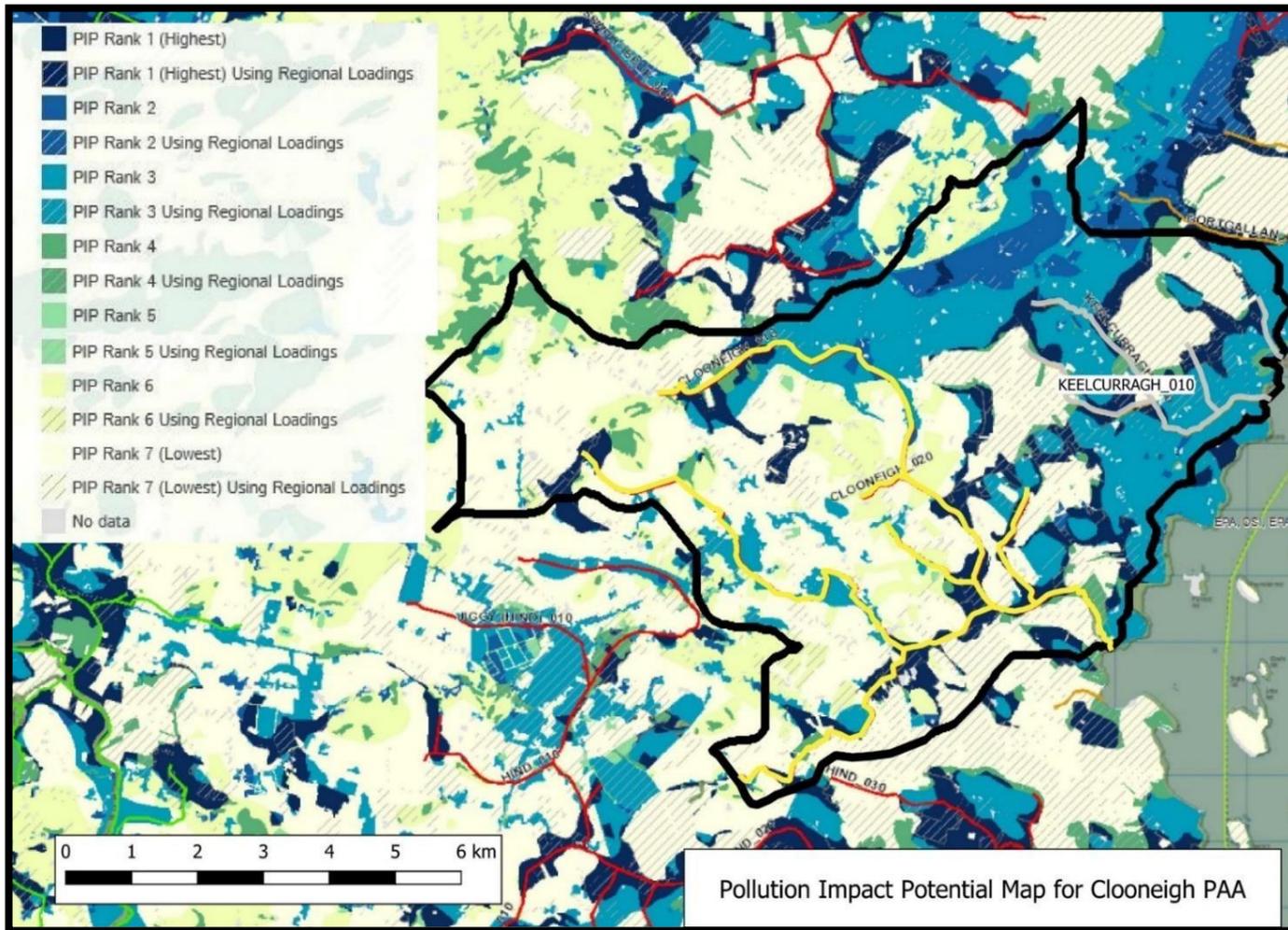


Figure 8 PIP Phosphate to surface water

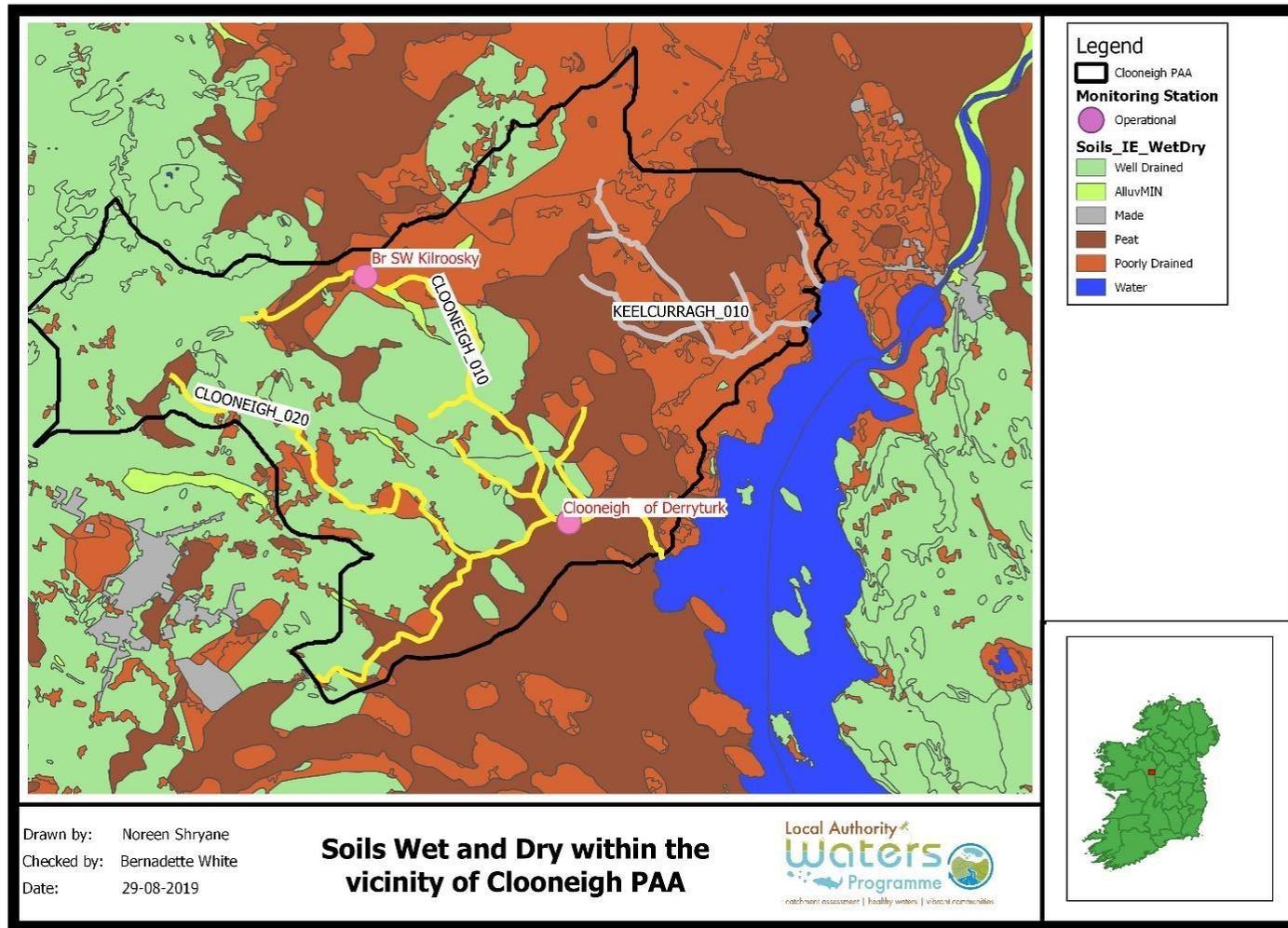


Figure 9 Wet and Dry Soils within the PAA

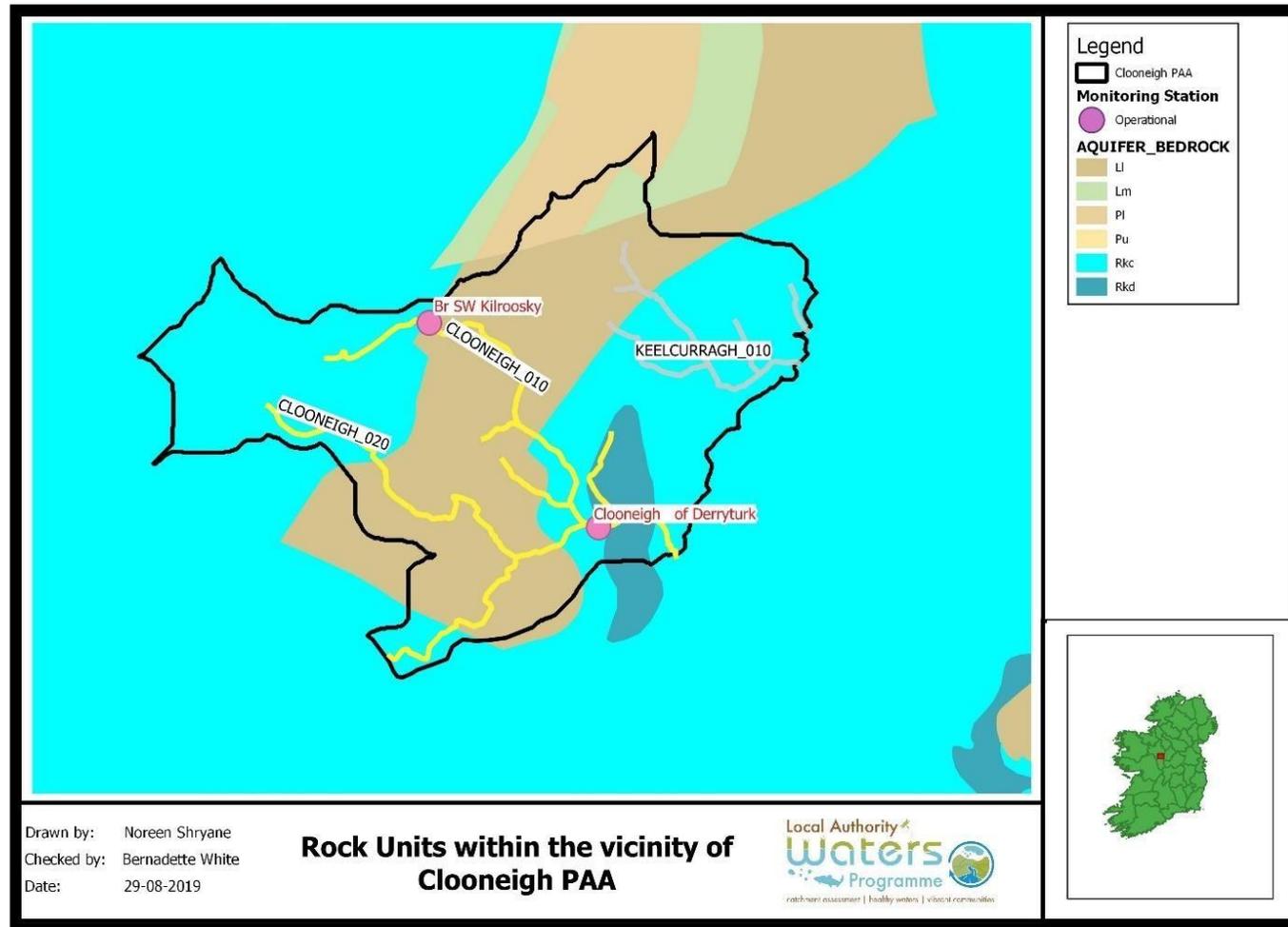


Figure 10 Rock Units within the PAA

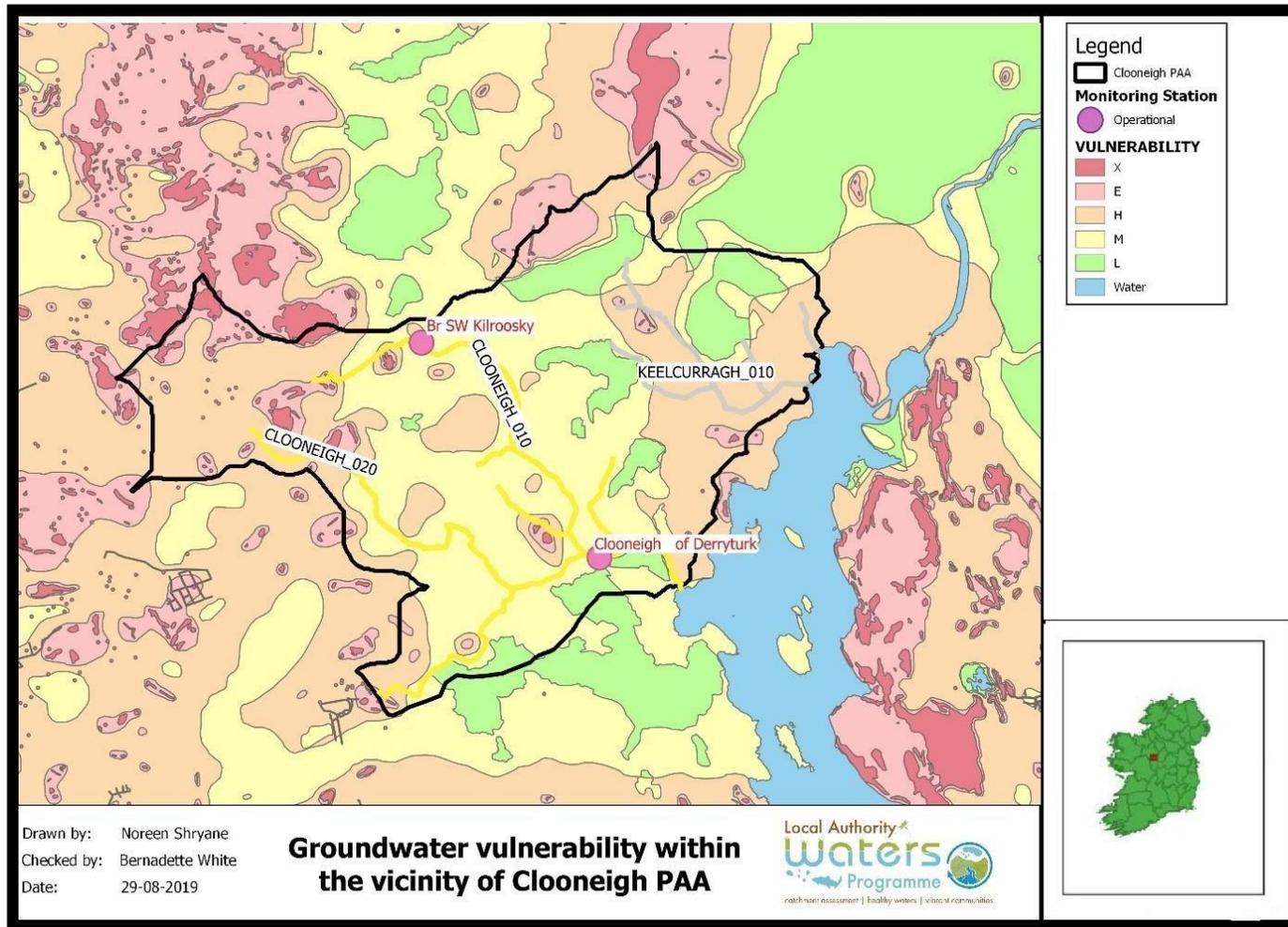


Figure 11 Groundwater Vulnerability within the PAA

## 5 Interim Story of the PAA

The Clooneigh PAA includes the river waterbodies; Clooneigh\_010, Clooneigh\_020 and Keelcurragh\_010. The Clooneigh\_010 and Clooneigh\_020 are both At Risk of not achieving their WFD Objectives and the Keelcurragh\_010 is At Review.

### **Clooneigh\_010**

The Clooneigh\_010 river waterbody is At Risk of failing to meet its WFD objectives and is currently at Moderate ecological status. The significant pressure identified by the EPA during initial characterisation was agriculture. The impact associated with this pressure is nutrient pollution. The land use in the PAA is predominately permanent pasture, peatland extraction and forestry. The majority of the Clooneigh\_010 water body is poorly draining or peat soils, therefore the transport of phosphate will be a risk throughout the PAA with the PIP ranking for P high (**Figure 8**).

### **Clooneigh\_020**

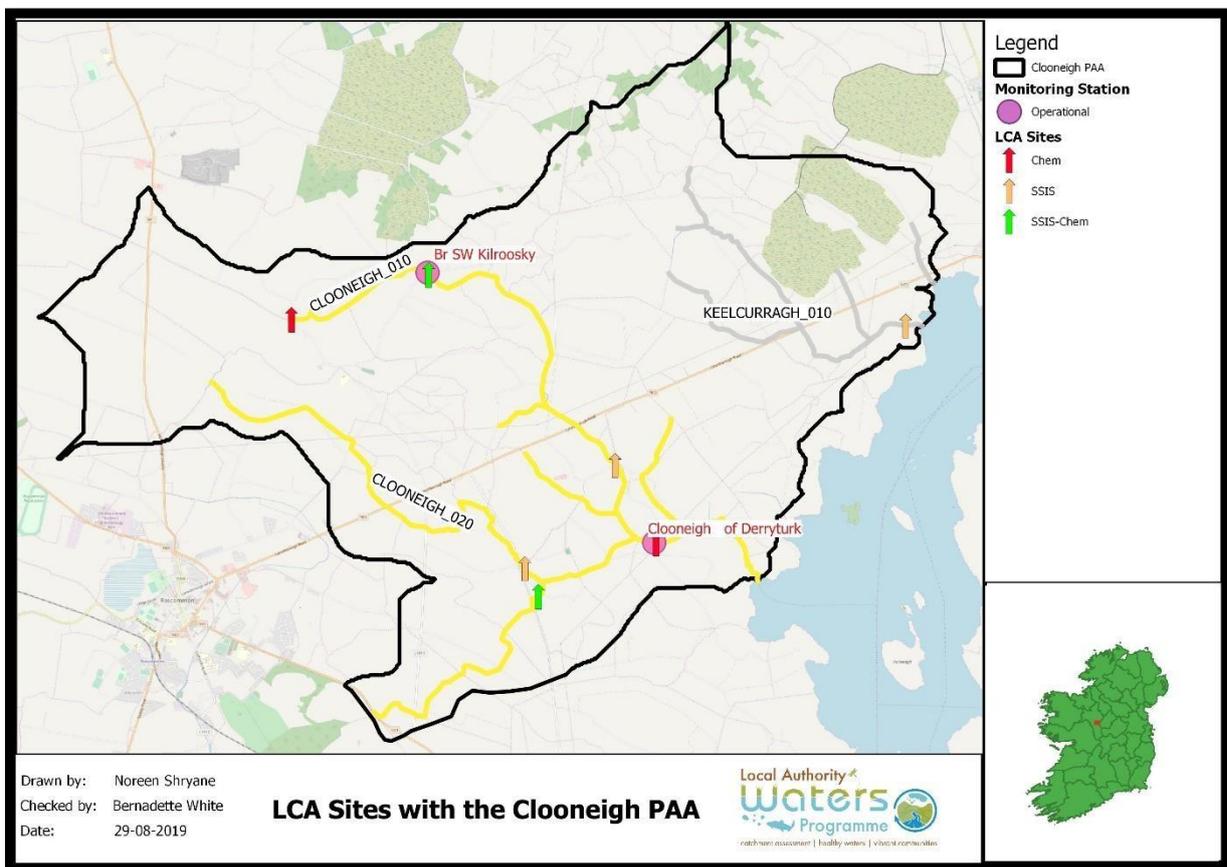
The Clooneigh\_020 river waterbody is *At Risk* of failing to meet its WFD objectives and is currently at Moderate ecological status. The significant pressure identified by the EPA during initial characterisation was agriculture. The impact associated with this pressure is nutrient pollution. The land use in the PAA is predominately permanent pasture, peatland extraction and forestry. There is high near surface phosphate susceptibility in the eastern and southern sections of the waterbody where the soils are wet and overland flow is the pathway. To the west and northern sections (and to a lesser extent) there is moderate sub surface nitrate susceptibility which rises to very high for a small proportion that aligns with the exposed calcareous bedrock and the areas of higher groundwater vulnerability and recharge.

### **Keelcurragh\_010**

The Keelcurragh\_010 is an unassigned river water body, therefore there is no monitoring data available to determine whether this water body is at risk or not at risk. The significant pressure identified by the EPA during initial characterisation was anthropogenic pressures. The significant issue cannot be determined with confidence at this stage without local catchment assessments. The land use in the PAA is predominately permanent pasture, peatland extraction and forestry. The waterbody is wholly contained in the poorly drained compartment. There is high near surface phosphate susceptibility where the soils are wet and overland flow is the pathway. The significant issues if present are therefore potentially phosphate, sediment and ammonia. There is a large area of peat extraction in this waterbody which is evident from aerial photography and which has been harvested industrially.

## 6 Work Plan

**Figure 12** below outlines the work plan for carrying out a local catchment assessment in the Clooneigh PAA. Round 1 of sampling will include chemical monitoring for phosphate, nitrate and ammonia at the EPA monitoring locations and at the source of the Clooneigh\_010 in order to determine if pollutants are carried into the Clooneigh from the ground water in the pure limestone area. A catchment walk of the Clooneigh\_010 is proposed, where PIP rank for phosphate is highest in the water body. Following chemical monitoring rapid assessment should be carried out at the major confluences to narrow down the critical source areas. The LCA in the Keelcurragh will focus on high PIP for phosphate areas also and on drains from peat extraction areas, if the assessment at the chosen SSIS site lowermost in the water body proves to be impacted.



**Figure 12** LCA Sites within the Clooneigh PAA

## 7 Review of Mitigation Options

Potential measures may include:

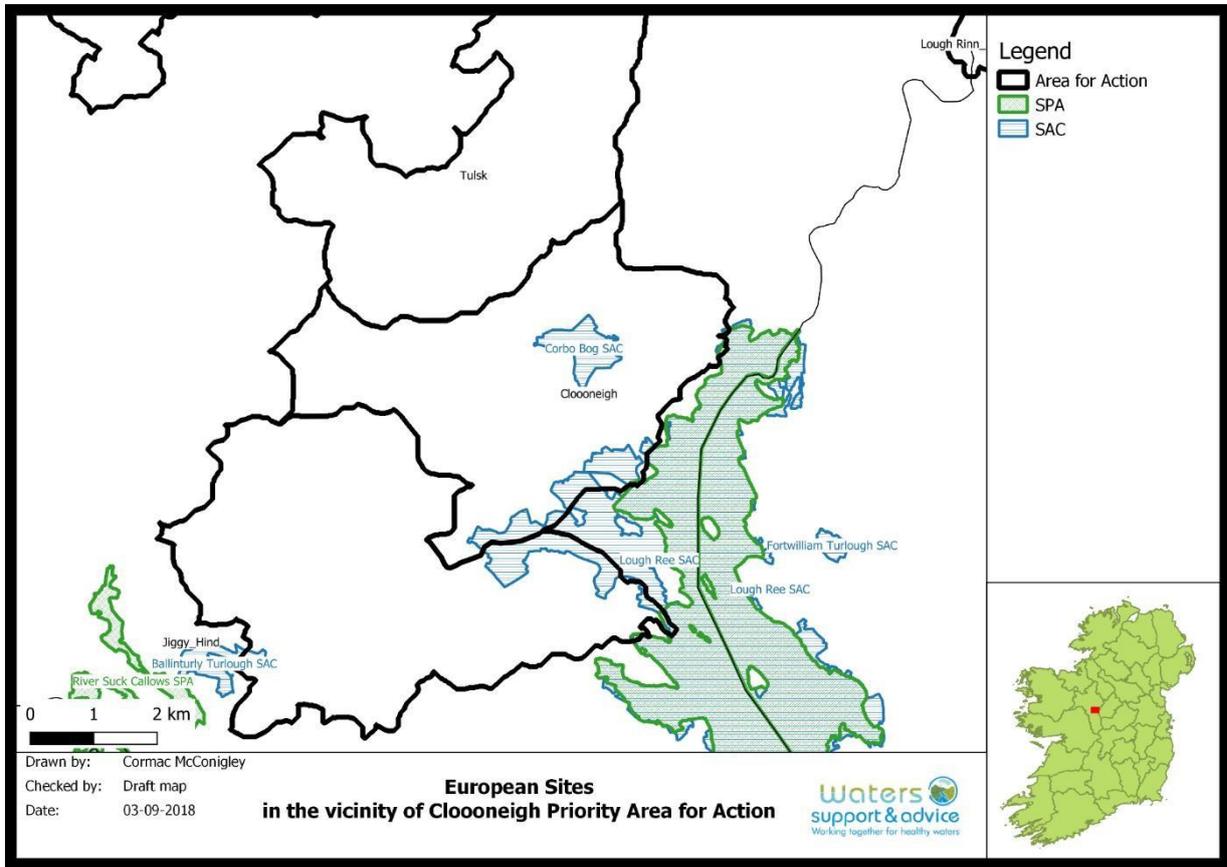
- The main impacts on water quality arising from peat extraction and drainage include the release of ammonium and fine-grained suspended sediments. Silt ponds serving the operational bogs are required to adhere to conditions in the Integrated Pollution Control (IPC) Licence for the protection of surface waters and groundwater. Silt ponds are required to be cleaned as a minimum twice a year, once before ditching and once before harvesting, and more frequently as inspections may dictate. The blockage of drainage channels and rewetting is another mitigation option to prevent losses of ammonium and sediment.
- In the areas of peat and poorly drained soils where phosphate is a potential issue, the following mitigation measures may apply: **1. Implementation of a Nutrient Management Plan** to ensure the right fertiliser is applied at the correct rate, appropriate time and that the land is suitable for application. **2. The establishment of** vegetated and unfertilised **buffer zones** along rivers to intercept and attenuate the phosphate.
- In the Karsified areas of the PAA where there are springs and swallow holes, buffer zones should be adhered to in order to avoid contamination of these features in which the contaminants can travel underground and cover large distances (even Km outside of the PAA).

## 8 Communications

- Community groups are active in the area such as Kiltreevan Tidy Towns Committee. The ideal location for the meeting is Kiltreevan Community Hall.
- An ASSAP farmers meeting is also recommended.

**Date of Completion: 7<sup>th</sup> November 2019**

## Appendix A – Protected Areas Within the PAA



**Figure 13** European sites within the PAA