

## Blackwater Longwood Priority Area for Action: Desk Study Summary

Below, we summarise the desk study findings for the Blackwater Longwood Priority Area for Action (PAA), Co. Kildare. Desk study reports are, as the name suggests, written at our desks. To write these reports, we use information about each of the rivers that we assess. This is a water based assessment at a particular point in time (up to end 2019) to identify the issues and pressures. We get our information from:

- The Environmental Protection Agency (EPA)
- Local Authorities
- Inland Fisheries Ireland
- Irish Water
- The Department of Agriculture, Food and the Marine
- Other public agencies.

The desk study also includes information learned from the public where we hold a community information meeting specific to the catchment. We held a community information meeting on the 9<sup>th</sup> of September 2020 via Zoom.

In our desk studies, we examine a number of things:

- Quality—how the water quality has changed since 2007.
- Importance—for example, if its water is used for drinking water, and if there are any rare plants or animals in it that we need to protect.
- Impacts from human activity—here we focus on impacts that damage water quality such as wastewater treatment, agriculture, forestry, physical changes to the water etc.

We complete desk studies first before starting our field-based assessments or local catchment assessments (LCAs). The accompanying LCA report contains the most up-to-date information on results from these assessments.

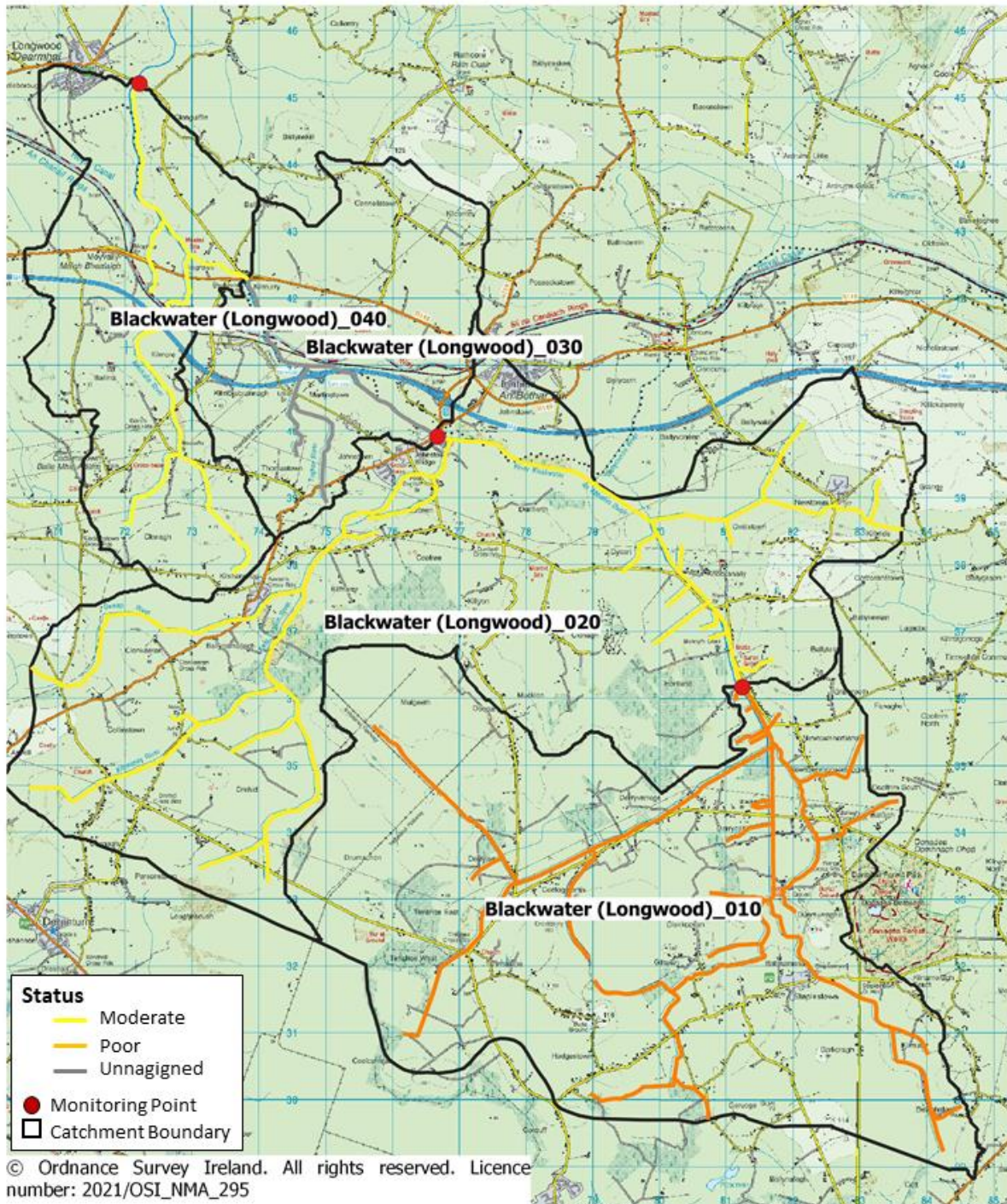
## 1. Background and Location

LAWPRO catchment scientists work in specific catchment areas called Priority Areas for Action (PAAs). A catchment is an area of land around a river, lake, or other body of water. Rainwater that falls in the catchment flows to the river, lake, or coastline. Rainwater that falls within a catchment eventually flows into rivers, lakes, or directly into estuaries or coastal waters bringing with it any contaminants that may be in the landscape.

The Blackwater Longwood Priority Area for Action (PAA), located in north County Kildare. It covers an area of approximately 140 km<sup>2</sup>, with combined main channel length of 102 km. The total land area included in the PAA is based upon the combined catchment areas of each of the PAA rivers and tributaries. A river's catchment is derived from the topography of the landscape, where all water that falls onto that catchment area flows into one river. When the river is large, we split it into smaller, more manageable sections. Each of these river sections has a smaller catchment area with a unique code, which we call waterbodies. At the bottom of these waterbodies, there are monitoring points, which are used to measure the quality of the incoming water.

In the Blackwater Longwood PAA, there are four river waterbodies (Map 1):

- Blackwater (Longwood)\_010 – the river rises south of Staplestown and flows north. The BLACKWATER (LONGWOOD)\_010 waterbody area includes the townlands of Timahoe, Giltown and Clogheraun.
- Blackwater (Longwood)\_020 – the main Blackwater channel continues north-west through the area of the Blackwater (Longwood)\_020 and is joined by a large tributary south of Johnstown.
- Blackwater (Longwood)\_030 – the waterbody area includes Martinstown, Newcastle and Kilmurry. Along this stretch, the main channel is joined by the Togher river.
- Blackwater (Longwood)\_040 – the main channel flows between waterbody Blackwater Bridge and Longwood in the Blackwater (Longwood)\_040. Along its course, it is joined by the Aleckafin River.



**Map 1: Blackwater Longwood PAA, 2013-2018 ecological status, location of monitoring points and waterbody catchment areas.**



**Photo 1: Straightened and deepened section of the Blackwater headwaters (top of BLACKWATER (LONGWOOD)\_010 waterbody.**

## 2. Catchment Description

Each of the rivers in the Blackwater (Longwood) PAA is a valuable asset to the community. For example, the river has a good stock of wild brown trout. Currently, the rivers are not reaching their potential to provide a diverse habit for animals, insects, fish and plants. It is our aim to improve the water quality and biodiversity within the river and its many tributaries.

The geology, soil type and topography within a catchment determines how water moves. In the Blackwater (Longwood) PAA, the catchment is made up of well drained soils with a substantial proportion of peaty soils and areas of peat extraction. There are also poorly draining soils throughout the PAA, mainly located around the margins of the catchment streams. On the poorly draining soils in the PAA, water cannot easily soak into the ground and collects. On the well-drained soils in the PAA, water is able to soak into the ground. From there it travels vertically into the underlying bedrock. The water then moves horizontally through the bedrock and flows upward into the streams in the PAA.

The majority of the land in the PAA is agricultural (permanent pasture) with a mix of both dairy and dry stock enterprises. Scattered throughout the catchment, there are also tillage fields with a variety of crops. The largest urban areas in the PAA are Longwood and Johnstown.

### 3. Water Quality History in the Blackwater (Longwood) PAA

Rivers and lakes are classified into five quality classes (status), with high status being unpolluted and bad status the most polluted.



The Environmental Protection Agency assign status at (approximately) 3-yearly intervals based on the standards set out in European legislation, the Water Framework Directive. Status is based on many different elements that altogether indicate the overall health of the river, for example the ecology recorded in river habitats, the physico-chemical condition of the river (oxygen levels, nutrient concentrations, indicators of organic and chemical pollution etc) and also the physical condition of the river bed and bank or lake shore.

Ecological results for the four Blackwater (Longwood) waterbodies are shown in Table 1. The waterbodies are organised in order of upstream to downstream.

Table 1: Summary of ecological status and deskstudy findings for each PAA waterbody.

Waterbody	2013-2018 Status	Our findings
Blackwater (Longwood)_010	Poor	The Poor ecological status in 2013-2018 is as a result of Poor Invertebrate Status. Invertebrates are insect species and include mayfly, stonefly, caddisfly and various worms and bivalves. They are food for fish and aquatic birds and are vital for healthy rivers. Status in the Blackwater (Longwood)_010 was last Good in 2009. Since then, it has been at Poor status.  Our investigation revealed that nutrient levels (in particular phosphate and ammonium) at this location are a likely contributing factor to status.

Waterbody	2013-2018 Status	Our findings
		<p>In addition, excessive siltation was noted during the EPA's ecological assessment.</p> <p>This part of the river is part of the Boyne Arterial Drainage Scheme. This may have resulted in modification to the natural profile of the river.</p>
Blackwater (Longwood)_020	<b>Moderate</b>	<p>The Moderate ecological status in 2013-2018 is because of Moderate Invertebrate Status. The waterbody deteriorated from Good to Moderate in 2009 and has remained Moderate since.</p> <p>Our investigation revealed that nutrient levels, and in particular nitrogen, have been showing a rising pattern since 2016.</p> <p>This part of the river is part of the Boyne Arterial Drainage Scheme. This may have resulted in modification to the natural profile of the river.</p>
Blackwater (Longwood)_030	<b>Unassigned</b>	<p>The Blackwater (Longwood)_030 has not been characterised by the EPA. LAWPRO will carry out ecological assessments along this section of the river to determine impact.</p>
Blackwater (Longwood)_010	<b>Moderate</b>	<p>The Moderate ecological status in 2013-2018 is because of Moderate Invertebrate Status. This section of the river last achieved Good status in 1990. Since then, it has remained at Moderate. Nutrient levels, particularly phosphate, at this section of the stream were consistently above acceptable levels since 2016.</p> <p>The waterbody is on the Boyne Arterial Drainage Scheme, which may have resulted in modifications to the natural profile of the river.</p>

## 4. Sources of Pollution

Pollutants find their way to rivers by a number of paths:

- They can be piped directly to the river from large sources such as wastewater treatment plants, or small sources such as faulty septic tanks, farmyards, roadside drains etc.

- They can flow across the ground to the river when nutrients which are applied to the land as fertiliser are washed off by rainfall before the crop and soil has absorbed them. This is usually a problem where soils are wetter and poorly draining, particularly during wet weather.
- Groundwater losses occur when pollutants move down through the soil and rock into groundwater and eventually into rivers, lakes, and coastal waters. This usually occurs when too much fertiliser is applied to land, or when the soil isn't ready to absorb the nutrient (e.g., temperatures too cold, incorrect soil pH etc) and is common in free-draining/ light soils.

A summary of ecological status, pressures, and significance in the Blackwater (Longwood) PAA is shown in Table 2.

Table 2: Summary of ecological status, pressures, and significance in the Blackwater (Longwood) PAA.

WB name	Risk	Ecological Status				EPA Characterisation Significant Pressure	Deskstudy Characterisation Significant Issue (2019)	Deskstudy Characterisation Significant Issue (2019)
		2007-2009	2010-2012	2010-2015	2013-2018			
Blackwater (Longwood)_010	At risk	G	P	P	P	Agriculture	Pasture	Nutrients (phosphate, ammonium) & siltation
						Extractive Industry	Peat - Harvesting	
						Hydro-morphology	Channelisation	
Blackwater (Longwood)_020	At risk	M	M	M	M	Agriculture	Pasture	Nitrogen (ammonium and nitrate)
						Hydro-morphology	Channelisation	
						Extractive Industry	Peat - Harvesting	
Blackwater (Longwood)_030	At risk	P	U	U	U	UWW	Enfield Agglomeration PE of 2,001 to 10,000	limited data
						Agriculture	Pasture	
Blackwater (Longwood)_040	At risk	U	M	M	M	Extractive Industry	Peat - Harvesting	Nutrients (nitrogen and phosphate)
						Anthropogenic Pressures	Unknown	

## 5. Engagement

### Community Meeting

On the 9<sup>th</sup> September 2020, we held a community information meeting (via Zoom) to tell the public about our work and to hear about water quality concerns from people living in the area. The attendees raised concerns about water quality and shared the concern of LAWPRO that the river was not as good as it could be.

### Farmers' Meetings

Agricultural Sustainability Support and Advice advisors from Teagasc and the Dairy Co-Ops will hold an information meeting for farmers within the PAA in late 2021. During this meeting, the advisors will give details of the supports available for farmers in this catchment.

## 6. Local Catchment Assessment

The desk study helps us inform our approach for undertaking our own fieldwork or local catchment assessment (LCA). Bearing in mind the potential sources of pollution indicated above our efforts will be centred around the critical source areas nitrate and phosphate loss, point sources such as urban wastewater, characterising the impact of drainage on the river and identifying areas of excessive ammonium and sediment loss from peat extraction.

LCA commenced in summer 2020 and continued into 2021. To date, water chemistry and streamflow analysis has been carried out at over 20 monitoring points throughout the PAA included sampling of three different rainfall conditions. Using this approach we can calculate the nutrient load coming from different stretches and tributaries along the streams. LCA will continue in 2022 and will include biological assessments using the Small Streams Impact Score (macroinvertebrates, macroalgae and macrophytes) plus water quality probes to record dissolved oxygen, stream conductivity, temperature and pH.

Based upon the results of the scientific methods outlined above, we will carry out focused stream walk on the worst affected sections of main channel and incoming tributaries. If agricultural activity is confirmed as a source of pollution, LAWPRO will communicate the LCA findings to the ASSAP advisor for the area who will work closely with farmers, providing them with a free and confidential advice to address the activity.



We will publish a summary of this work, when available.