

Clonshanbo/Lyreen Priority Area for Action: Desk Study Summary

Below, we summarise the desk-top assessment findings for the Clonshanbo/Lyreen Priority Area for Action (PAA). 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 April 2020) to identify the issues and pressures.

We get our information from:

- The Environmental Protection Agency
- Local authorities
- Inland Fisheries Ireland
- Irish Water
- Other public agencies

It also includes information learned from the public at a local community meeting, which was held in Rathcoffey GAA club house, Co. Kildare on the 11th of April 2019.

In our desk study reports, we tell you about a particular river, lake, or coastal waters:

- **quality**—how the water quality has changed over the past 3–6 years.
- **importance**—for example, we ask if it is water used for drinking water, and if there are any rare plants or animals in it, 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.

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.

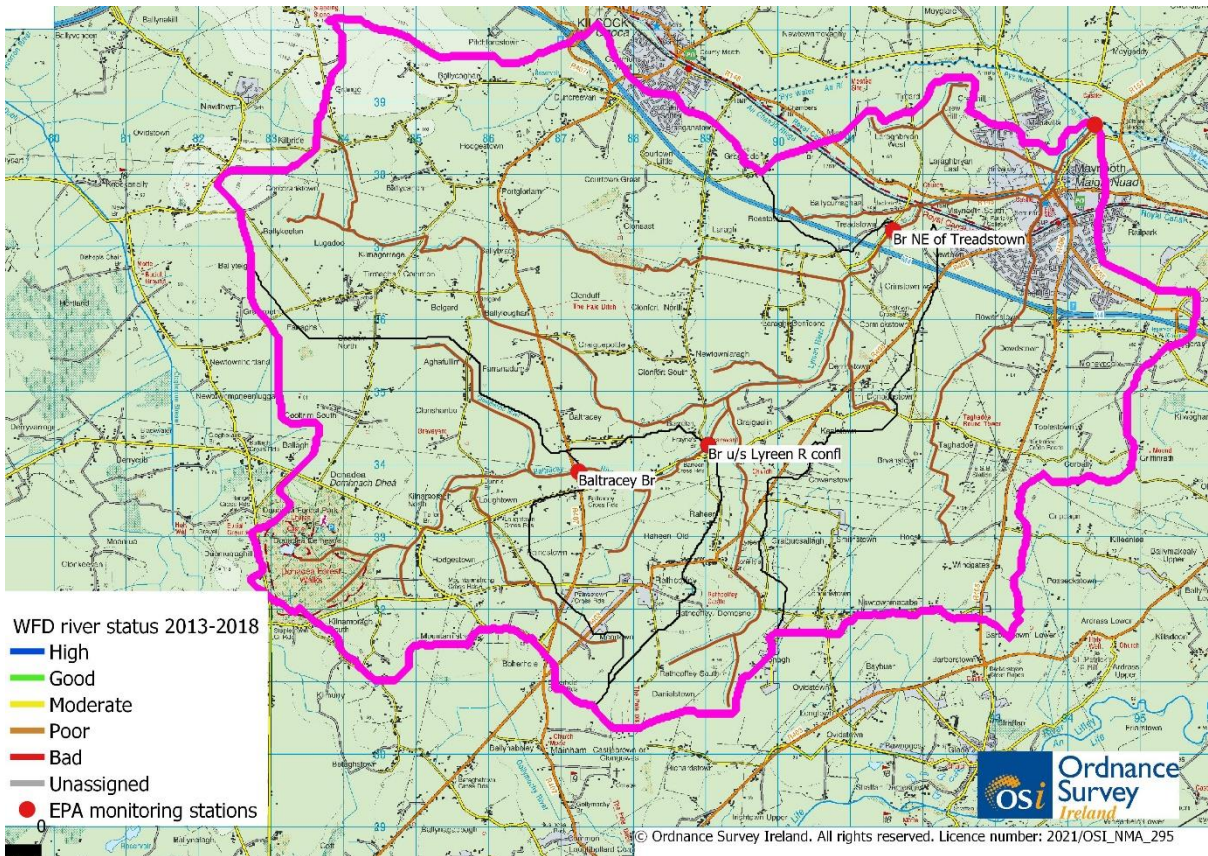
1. Background and Location

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 Clonshanbo/Lyreen PAA is situated southwest of Maynooth, Co. Kildare. The total land area included in the PAA is based upon the combined catchment areas of each of the two rivers. 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 Clonshanbo/Lyreen PAA, it is divided into four sections or waterbodies, which are distinguished by a unique number (shown in Map 1):

- Clonshanbo_010: This waterbody flows from Donedea forest park to Baltracy bridge.
- Clonshanbo_020: This waterbody flows from Baltracy bridge to Fraynes bridge.
- Lyreen_010: This waterbody flows from Fraynes bridge to bridge northeast of Treadstown.
- Lyreen_020: This waterbody flows from bridge northeast of Treadstown through Maynooth and joins the Rye River west of Maynooth.



Map 1: Clonshanbo/Lyreen PAA, ecological status, location of monitoring points and waterbody catchment areas.

2. Catchment Description

The main urban areas in the catchment area of the Clonshanbo/Lyreen are Maynooth, and Kilcock Co. Kildare. The Clonshanbo_010 and Clonshanbo_020 are part of the Office of Public Works (OPW) drainage district.

Agriculture is the main land-use in the catchment, with a mixture of different farming enterprises.

The topography is relatively flat in the PAA. The geology and soil type within a catchment determines how water moves, and the soils are generally poorly drained throughout the catchment.

3. Water Quality history in the Clonshanbo/Lyreen PAA

Rivers are classified into five quality classes (status), with high being unpolluted and bad being 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 elements that altogether show 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.

We need to make sure that the Clonshanbo/Lyreen PAA achieves **Good Status**. We have reviewed water quality data available for each of the waterbodies (Table 1) and we have found that:

Waterbody	Status (2013 – 2018)	Our findings
Clonshanbo_010	Poor	The water quality has been poor for more than 30 years. We have identified that the level of the nutrients, ammonium and ortho-phosphate in the river are too high. These nutrients have caused a decline in water quality.
Clonshanbo_020	Poor	The water quality has been poor for more than 30 years. We are unsure what is causing this unsatisfactory water quality as there is no information on nutrient levels available.
Lyreen_010	Poor	The water quality has been poor for more than 10 years. We have identified that the levels of the nutrients, ammonium and ortho-phosphate in the river are too high.

Waterbody	Status (2013 – 2018)	Our findings
		These nutrients have caused a decline in water quality.
Lyreen_20	Poor	The water quality has been poor for more than 30 years. We have identified that the levels of the nutrients, ammonium and ortho-phosphate in the river are too high. These nutrients have caused a decline in water quality.

4. Sources of Pollution

Pollutants find their way to rivers by several paths:

- They can be through pipes directly connected to the river from large sources such as wastewater treatment plants, or small sources such as faulty septic tanks, farmyards, roadside drains.
- They can flow across the ground to the river when nutrients applied to the land as fertiliser wash 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 is not ready to absorb the nutrient (e.g., temperatures too cold, incorrect soil pH etc) and is common in free-draining/ light soils.

We have identified potential sources of pollution in the Clonshanbo/Lyreen PAA, which we will examine further. These are agriculture, septic tanks, run-off from urban areas (Maynooth), hydromorphology and industry (Lyreen_010).

Agriculture

Given the wet soils in most of the PAA, it will be easy for pollutants such as phosphorus and sediment to be lost into the rivers and streams in this catchment via drainage channels and small streams. Phosphate and sediment losses within a catchment are strongly related to soil type as wet, poorly draining soils which are predominately adjacent to the river channel, such as in this catchment, cause rainfall to run over the land surface and into nearby watercourses. Pollution Impact Potential (PIP) mapping from the EPA has highlighted some areas in the catchment that are at greater risk from phosphate and sediment losses due to the soils and stocking in those areas. These areas will be assessed for water quality impacts during LCAs. Nutrients also may enter the river through point sources.

Septic Tanks

In poorly drained soils, septic tanks and wastewater treatment systems may not have a sufficient/malfunctioning filtration, which may cause nutrients to wash into the river or nearby drains.

Urban Run -off

In urban areas, run-off which contain nutrients from roads and buildings may enter the river and impact the water quality.

Hydromorphology

Hydromorphology is a term used to describe man-made changes that alter the river flows or physical impacts on the river's natural course (e.g., straightening of channel and land drains). Straightening of the river or overly deepened land drains can also be a source for sediment, which can impact the water quality. Given the wet soils in the PAA, it will be easy for sediment to be lost into the river. Sediment losses within a catchment are strongly related to soil type as wet, poorly draining soils such as in this PAA, which cause rainfall to run over the land surface and into the nearby river or drain.

We may also identify other sources during our fieldwork.

Table 2 Ecological status, pressures, and significance in the Clonshanbo/Lyreen PAA

WB Code	WB Name	WB Type	Risk	Ecological Status				EPA Characterisation Significant Pressure Category (Sub-category) (2013-2015)	EPA Characterisation Significant Issue (2013-2015)	Desk Study Review Potential additional pressures (2019)	Desk study Review Potential Significant Issue (2019)
				2007 – 2009	2010 – 2012	2013 – 2015	2016 – 2018				
IE_EA_09C 030300	CLONSHANBO_010	River	At Risk	Poor	Poor	Poor	Poor	Agriculture (pasture)	Nutrient pollution	hydromorphology	Sediment
								Domestic Wastewater (wastewater discharge)	Nutrient & organic pollution		Topographical changes
Channel modification											
IE_EA_09C 030600	CLONSHANBO_020	River	At Risk	Poor	Poor	Poor	Poor	Agriculture (pasture)	Nutrient pollution	hydromorphology	Sediment
								Domestic Wastewater (wastewater discharge)	Nutrient & organic pollution		Topographical changes
Channel modification											
IE_EA_09L 020035	LYREEN_010	River	At Risk	Mod	Poor	Poor	Poor	Agriculture (pasture)	Nutrient pollution	hydromorphology	Sediment
								Domestic Wastewater (wastewater discharge)	Nutrient & organic pollution		Topographical changes
								Industry (Section 4)	Nutrient & organic pollution		Channel modification
IE_EA_09L 020100	LYREEN_020	River	At Risk	Poor	Poor	Poor	Poor	Agriculture (pasture)	Nutrient pollution	hydromorphology	Sediment
								Urban Run-Off (Diffuse Sources Run-Off)	Nutrient & organic pollution		Topographical changes
Channel modification											

5. Engagement

Community Meeting

We held a community information meeting in Rathcoffey GAA club house Co. Kildare on the 11th of April 2019 to tell the public about our work and to hear about water quality concerns from people living in the area. The issues raised at the community information meeting included river maintenance and cross compliance on farms, siltation in the river, and who the community should engage with to improve water quality.

Farmers Meeting

Agricultural Sustainability Support and Advice advisors from Teagasc Glanbia and Lakelands held an information meeting for farmers within the PAA. During this meeting, the advisors gave 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). LAWPRO's catchment scientists will carry out fieldwork to identify areas with highest impact. We will collect water samples to learn about the nutrient levels in the rivers. We will walk selected stretches of the river to identify where ammonium, ortho-phosphate and other pollutants are being lost from the land. We will measure the dissolved oxygen, pH, temperature, and conductivity at each site.

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.