

Lough Rinn Forbes Priority Area – Desk Study Summary

Below, we summarise the desk study findings for the Lough Rinn Forbes 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 and lakes that we assess. This is a water based assessment at a particular point in time to identify the issues and pressures. The desk study was completed on the 22nd of November 2019, this summary is based upon information gathered to this date.

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.

It also includes information learned from the public at a local community meeting, which was held in Cloonmorris Community Centre, Bornacoola, Co. Leitrim on the 2nd 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 at if it is water used for drinking water, and if there are any rare plants or and 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. This desk study was written in 2019.

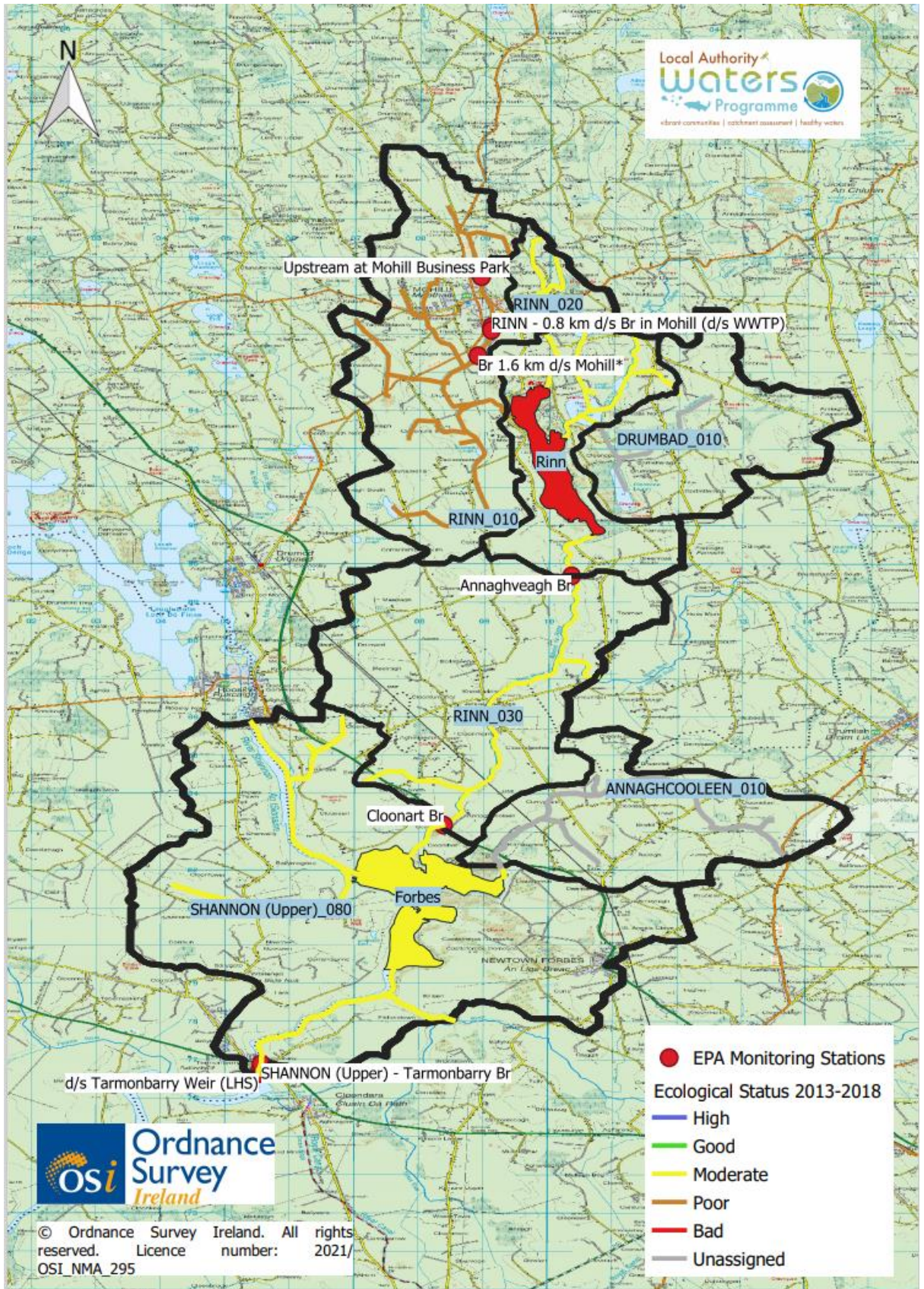
1. Background and Location

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 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 total land area included in the PAA is based upon the combined catchment areas of each of the 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.

The Lough Rinn Forbes PAA covers parts of Leitrim, Longford and Roscommon. It is divided into 8 sections or waterbodies, which are distinguished by a unique number (shown in Map 1):

- Rinn_010: This waterbody flows from the from North to South through Mohill village before entering Lough Rinn.
- Rinn_020: This waterbody flows from north to south, on the east side of Mohill town before entering Lough Rinn.
- Rinn_030: This water body flows from Lough Rinn down towards Lough Forbes in a southerly direction.
- Annaghcooleen_010: This waterbody flows in a south westerly direction north of Newtown Forbes before flowing into Lough Forbes
- Drumbad_010: This waterbody flows into Lough Errew before flowing into Lough Rinn.
- Shannon (Upper)_080: This waterbody flows in a south easterly direction before entering Lough Forbes.
- Lough Rinn: Is located just South of Mohill town, Co. Leitrim.
- Lough Forbes: Is located to the west of Newtown Forbes, Co. Longford.



Map 1: The Lough Rinn Forbes PAA 2010-2015 ecological status, location of monitoring points and waterbody catchment areas.

2. Catchment Description

The main settlements in the catchment area of the Lough Rinn Forbes PAA are Mohill, Co. Leitrim (in the north) and Newtown Forbes, Co. Longford (in the south east). Agriculture is the main land-use in the catchment, with areas of peatlands and forestry dotted throughout the catchment.

The geology and soil type within a catchment determines how water moves. The bedrock in the PAA is varying degrees of limestone. The PAA predominantly overlays locally important aquifers. A regionally important and poor aquifer are located to the South and South East of the PAA. The soils in the catchment are predominantly made up of peaty and poorly draining soils. These types of soils create overland flow pathways for pollutants to enter the receiving waters. Because of the soil types in the catchment, it has a high drainage density, and these networks will be assessed during fieldwork, as these are pathways for pollutants. The PAA catchment area is predominantly poorly draining, which has the potential to create pathways for the transport of sediment, phosphorus and pesticides to the receiving waters. (Photo1)

Lough Forbes is the source for drinking water for the Longford Central drinking water supply. The main channel of the Rinn River between Lough Rinn and Lough Forbes forms the Rinn River Natural Heritage Area (NHA). The Clooneen Special Area of Conservation (SAC) Bog also lies within the PAA boundary.

3. Water Quality history in the Lough Rinn Forbes 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 Lough Rinn Forbes 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 (2010-2015)	Our findings
Rinn_010	Poor	We have identified the levels of the nutrients ortho-phosphate, ammonia and BOD are too high.
Rinn_020	Moderate	We are unsure what is causing this unsatisfactory water quality in the river.
Rinn_030	Moderate	We are unsure what is causing this unsatisfactory water quality in the river.
Annaghcooleen_010	Unassigned	We are unsure of the status or potential impacts associated with this waterbody.
Drumbad_010	Unassigned	We are unsure of the status or potential impacts associated with this waterbody.
Shannon (Upper)_080	Moderate	We have identified the levels of the nutrients ortho-phosphate and ammonia are too high.
Lough Rinn	Moderate	We have identified the levels of the nutrient ortho-phosphate are too high.
Lough Forbes	Moderate	We have identified the levels of the nutrient ortho-phosphate are too high.



Photo12: Rinn_030 at Johnstown Bridge

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 Lough Rinn Forbes PAA (Table 2), which we will examine further. The significant pressures associated with each waterbody are listed below:

Urban wastewater can enter the receiving waters through direct discharges from wastewater treatment plant primary discharges, SWOs or misconnections. This pressure has been assigned to the Rinn_010.

Agriculture is a likely source of the elevated nutrients in the Rinn_020, Rinn_030, Shannon (Upper)_080, Annaghcooleen_010, Drumbad_010, Lough Rinn & Lough Forbes. The PAA is predominantly poorly draining, therefore water tends to pond or travelling across the surface of the ground, before entering the receiving water.

Hydromorphology is where the waterbody and land adjacent to the waterbody are physically changed from their natural conditions. This pressure has been assigned to Lough Rinn itself. Physical changes to a lake can alter its flow, which can impact the ecosystem of the lake.

Invasive species have been identified as significant issues within Lough Rinn & Lough Forbes. Zebra mussels are present in both loughs. Zebra mussels can change the nutrient cycles in lakes. They cause a reduction of phytoplankton and zooplankton. They increase water clarity and plant growth around lake margins.

Longford Central Drinking Water Supply is abstracted from Lough Forbes. This is not deemed to be a significant pressure on the lake. There has been an issue with pesticides in the supply over recent years. LAWPRO has established and chairs a Lough Forbes Focus Group. It facilitates the collaboration between a number of stakeholders to reduce the volume of pesticides entering the receiving waters within the drinking water catchment area.

Peat harvesting has been listed as a significant pressure on Lough Forbes. Peat extraction can contribute sediment and nutrients to the receiving waters.

A discharge, licensed by the local authority, was identified as a significant pressure to Lough Rinn. This has the potential to discharge nutrients to the receiving water, which can impact water quality.

We may also identify other sources of pollution during our fieldwork.

Waterbody Code	Waterbody name	Waterbody Type	Risk	Ecological Status			EPA Characterisation Significant Pressure Category (Sub-category) (2010-2015)	EPA Characterisation Significant Issue (2010-2015)	Desk Study Review Potential additional pressures	Desk study Review Potential Significant Issue
				2007 - 2009	2010 - 2012	2010 - 2015				
IE_SH_26R020100	Rinn_010	River	At Risk	Poor	Poor	Poor	Urban Waste Water (Agglomeration PE of 1,001 to 2,000)	Nutrient & Organic Pollution		Nutrients
IE_SH_26R020200	Rinn_020	River	At Risk	Moderate	Unassigned	Moderate	Agriculture (Pasture)	Nutrient Pollution		
IE_SH_26R020400	Rinn_030	River	At Risk	Moderate	Moderate	Moderate	Agriculture (Pasture)	Nutrient Pollution		
IE_SH_26D560860	Drumbad_010	River	At Risk	Unassigned	Unassigned	Unassigned	Agriculture (Pasture)	Nutrient Pollution		
IE_SH_26A430910	Annaghcooleen_010	River	At Risk	Unassigned	Unassigned	Unassigned	Agriculture (Agriculture)	Nutrient Pollution		
IE_SH_26S021510	Shannon (Upper)_080	River	At Risk	Moderate	Good	Moderate	Agriculture (Pasture)	Nutrient & Organic Pollution		Nutrients
IE_SH_26_700	Lough Rinn	Lake	At Risk	Bad	Bad	Moderate	Industry (Section 4)	Nutrient & Organic Pollution		
							Agriculture (Agriculture)	Nutrient & Organic Pollution		
							Hydromorphology (Weirs, dams, locks, barriers) *	Altered habitat due to Morphological changes		

							Invasive Species (Invasive Species)	Nutrient Pollution & Other significant impacts		
IE_SH_26_723	Lough Forbes	Lake	At Risk	Moderate	Moderate	Moderate	Abstractions (Water Supply)			
							Agriculture (Pasture)	Nutrient Pollution		
							Invasive Species (Invasive Species)	Altered habitat due to Morphological changes		
							Extractive Industry (Peat)	Nutrient Pollution		

Table 1: Ecological status, pressures, and significance in the Lough Rinn Forbes PAA

* Hydromorphology means the alteration of the river flows or physical impacts to the rivers themselves which can affect the sediment regime in the river. In Barrow_090 this pressure relates to the channelisation which is straightening of the river

5. Engagement

Community Meeting

We held a community information meeting in Cloonmorris Community Centre, Bornacoola, Co. Leitrim via Zoom on the 2nd of April 2019 to tell the public about our work and to hear about water quality concerns from people living in the area.

Farmers' Meeting

Agricultural Sustainability Support and Advice advisors from Teagasc and DAIRY CO-OP Lakeland 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.

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 nitrate, 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 we confirm that agricultural activity is 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.