

Summary: Lough Gill Priority Area for Action Desk Study

This is a simple summary of the desk study on the Lough Gill Priority Area for Action (PAA).

A desk study is the first step in our work. We gather available information about the lake and river into a single document. The information comes from many public bodies including:

- 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 January 2021.

The study helps us to understand:

- The quality of the water in the lake and the river
 - Has it changed in the last few years?
- The importance of the lake and the river
 - Are there any rare plants, animals or habitats that must be protected?
 - Is it used to supply our drinking water?
- The human-made impacts
 - Is there a wastewater treatment plant?
 - Is land used for agriculture or forestry?
 - Has the river been changed physically?

We do desk studies first and then local catchment assessment studies (LCAs), so an LCA report contains the most up to date information where available.

Background and location

LAWPRO catchment scientists work in specific catchment areas called Priority Areas for Action (PAAs). The Lough Gill PAA is mostly in Co. Sligo with the most easterly section of Lough Gill in Co. Leitrim. It consists of two waterbodies:

- The Lough Gill waterbody is a lake. It is a large, deep lake which is longer from east to west than it is from north to south. The land around Lough Gill falls quite steeply towards the lake with Killary Mountain and Slieve Daeane on the southern and south-western shores. The eastern and northern shores are also very hilly and rocky. The inflowing streams flow down narrow, steep valleys into the lake. The shoreline in the north-west around Hazelwood is more gently sloping. The Bonet River flows into the lake from the south-west after flowing through Dromahair.
- The Garavogue river flows out of Lough Gill near Hazelwood to the west of the lake. It flows through Sligo town centre and into Sligo Harbour.

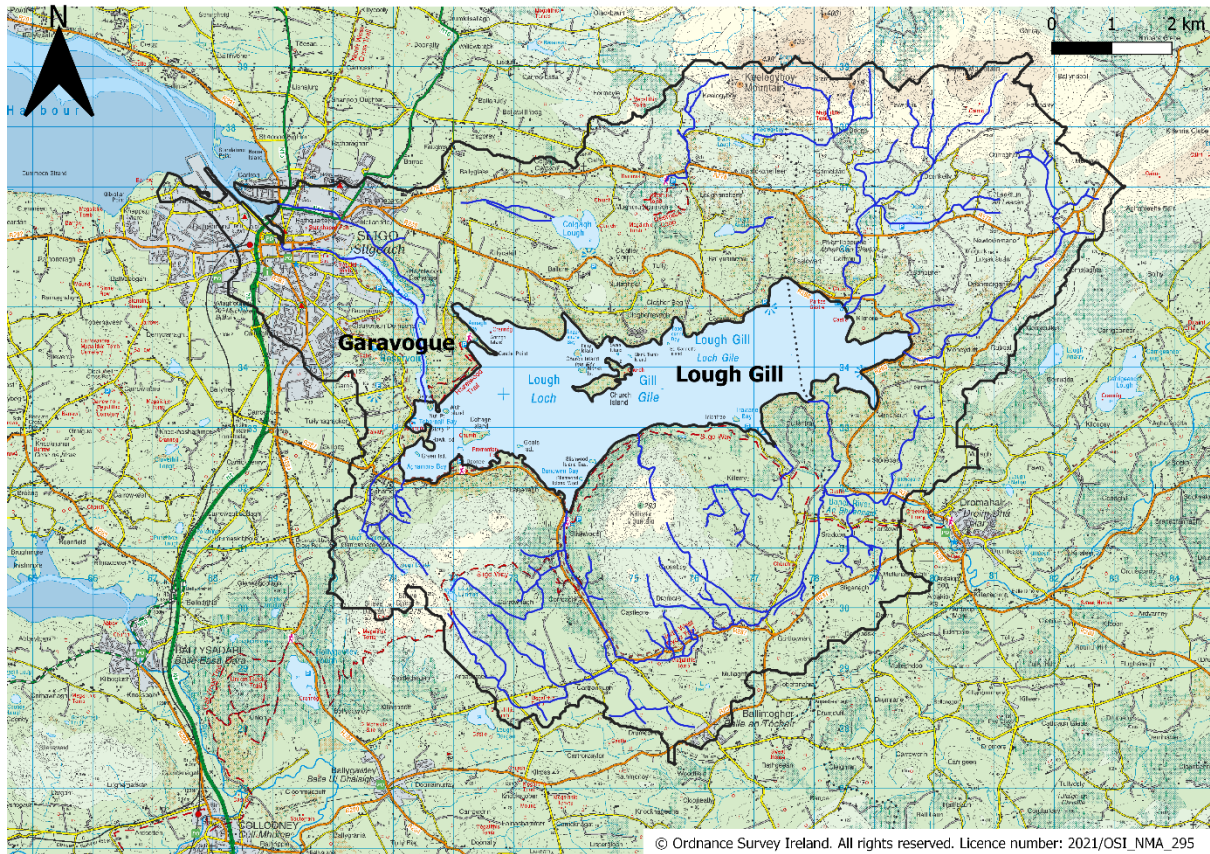


Figure 1 The Lough Gill PAA

Catchment Description

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.

The Lough Gill PAA includes much of Sligo town around the Garavogue river and a large area to the east and south-east around Lough Gill. Ballintogher village lies just inside the PAA to the south of Lough Gill. Dromahair lies just outside the PAA in the south-east. The Bonet river flows through Dromahair and flows north-west into Lough Gill.

Lough Gill is in an area of great natural beauty. An island in Lough Gill called Inishfree inspired the famous poem *The Lake Isle of Inishfree* by the Nobel Prize winning Irish writer, W.B. Yeats. Both the Garavogue river and Lough Gill are popular for water sports such as rowing, kayaking and swimming. The lake is popular with anglers, it is known as a good salmon and trout fishery. There are many walking and cycling trails located around the lake including the Sligo Way, the Hazelwood Trail, the Deerpark Loop and the North West Cycle Trail.

The geology in the PAA is interesting with the lake lying along a boundary between very old metamorphic rocks to the south and limestone karst to the north. Caves and springs are common in the limestone rock and can be connected by underground streams. It is likely that some of these underground streams eventually flow into Lough Gill or the Garavogue river.

Soils to the north, west and north-east of the Lough Gill are mainly well-draining but soils to the south and south-east of Lough Gill are mainly wet soils. This reflects the geology, with the well-draining soils on the limestone rock and the wet soils on the older metamorphic rocks. Outside of the urban Sligo area land-use is mainly agricultural pasture or forestry.

The drinking water for the Sligo and Environs Water Supply Scheme and the North Leitrim Regional Water Supply Scheme comes from Lough Gill. The groundwater in the PAA is an important source of drinking water for households with private wells.

Lough Gill, and many areas around its shores, are in a Special Area of Conservation (SAC) for wildlife. The Garavogue river flows into Sligo Harbour and Sligo Bay which is part of the Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC and the Cummeen Strand Special Protected Area for birds such as the light-bellied Brent goose, the oystercatcher, and the redshank. Sligo Harbour is also protected for shellfish. Rosses Point in Sligo Bay is a designated bathing location.

Water Quality in the Lough Gill PAA

Rivers and lakes are classified into five quality classes (status), with high being unpolluted and bad being the most polluted. We need to make sure that the waterbodies in the Lough Gill PAA are at Good status.



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.

We have reviewed water quality data available for each of the waterbodies and we have found that:

- The Lough Gill waterbody is currently at Moderate status. We have identified that the levels of the nutrient phosphorous in the lake may be too high. This type of lake is very sensitive to even small increases in phosphorous. The lake is also infested by zebra mussel which are an invasive type of mussel that can change the natural characteristics of water in the lake.
- The Garavogue waterbody is at Poor status. We have identified that human changes to the natural flow of the river and changes to the shape of the riverbed and riverbanks may be causing problems in the river. Available information about nutrient levels in the river show nutrient levels to be satisfactory. We will need to further investigate in the next stage of our work.

Water body 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	2010 - 2015	2013-2018					
Gill SO	Lake	At Risk	Moderate	Moderate	Poor	Moderate	Agriculture (Pasture)	Nutrient Pollution	Urban Waste Water	Total Phosphorous	
							Invasive Species		Other		Single House Discharges
											Forestry
Garavogue	River	At Risk	Good	Good	Poor	Poor	Urban Run-off	Nutrient Pollution	Hydromorphology (channelisation)	Altered habitat	
							Forestry		Morphological Changes		Combined Sewer Overflows
											Forestry
								Agriculture	unknown		

Sources of Pollution

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

- They can be piped directly to the river or lake 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 or lake 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.
- In urban areas rainfall can wash pollutants over roads, paths and drains into the river, or wastewater can be piped directly to the river from industry, businesses, or other premises.

We have identified potential sources of pollution in the Lough Gill PAA which we will examine further. These are urban run-off, wastewater, agriculture, forestry, and quarries. Other sources may also be identified during our fieldwork.

The zebra mussel (*Dreissena polymorpha*), an invasive species in Ireland, is also an issue in Lough Gill. Zebra mussels thrive in calcium and nutrient rich conditions. They filter algae from the water reducing chlorophyll levels. This can cause water clarity to increase depending on the size of the zebra mussel population. This can lead to changes in the community of plants and other primary producers in the lake. Zebra mussels cannot be controlled or eradicated from a lake at present.

Next Steps

Information Meetings

We held a community information meeting online on the 20th January 2020 to tell the public about our work and to hear about water quality concerns from people living in the area. The meetings were attended by members of the public and local stakeholders. The meeting involved two presentations by LAWPRO followed by a Q&A session with the attendees.

At the meeting we listened to concerns raised that the PAA should include the Bonet River and Belhavel Lough. We advised that these waterbodies will be considered for the next cycle of the River Basin Management Plan. Concerns were raised about the area being unsuitable for windfarms. We are not aware of any plans for windfarms in the PAA. We listened to concerns about flooding and its impact on water quality. We also listened to concerns about forestry and its impact on water quality. We listened to disappointment from participants in the meeting that after so many years of river basin management planning Lough Gill still had unsatisfactory water quality. Participants asked for further information on the grants available to community groups for projects relating to the river. They also asked about what type of projects would be suitable.

Agricultural Sustainability Support and Advice Programme (ASSAP) advisors from Teagasc will hold an information meeting for farmers in this catchment. During the meeting they will give details of the supports available for farmers in this catchment.

Local Catchment Assessment

LAWPRO's catchment scientists will carry out fieldwork to identify areas with highest impact. We will collect water samples to learn more about the nutrient levels in the Garavogue river and the streams flowing into Lough Gill. We will walk selected stretches of these streams, the Garavogue river and along the shoreline of the lake to identify where pollutants are being lost from the land. We will need to consider that underground streams may be bringing pollutants into the lake and the river from land further back in the catchment. This work is expected to commence in early 2022.

The outcome of this work will be published here when available.



Figure 2 Inishfree on Lough Gill



Figure 3 Lough Gill from Aghamore Bay