



Referral Report

Agricultural Sustainability Support and Advisory Programme (ASSAP)

Advisors working with [ASSAP](#) offer a free and confidential advisory service to farmers. Where farmers agreed to take part in the programme the advisor carried out a farm assessment and recommended mitigation actions targeted to address the water issues identified by the Local Authority Waters Programme ([LAWPRO](#)).

Mitigation Actions Recommended

During a farm visit the advisor identifies issues that need mitigation measures implemented to reduce the risk to water quality. These are categorised as Risk 1, 2 or 3. Risk 1 issues are those that are most likely to impact on water quality and relate directly to the water quality issues identified by LAWPRO. Risk 2 and 3 are other issues on the farm that may require management or improvement which would indirectly lead to improvement in water quality.

Reporting

Waterbody scale reports are a summary of the issues impacting water quality and the mitigation actions implemented by farmers. They are a synthesis and interpretation of individual referral reports. They are prepared by ASSAP advisors following review with the catchment scientist.

Accompanying this report are summary details of the mitigation actions recommended and implemented in this waterbody. This report and the accompanying tables will be uploaded to the WFD App.

Summary

PAA	<i>Glan Stream</i>
No. of waterbodies	<i>1</i>
Water body name	<i>Glan Stream 010</i>
Number of referrals	<i>6</i>
Referral codes	<i>RA0000031, RA0000032, RA0000034, RA0000035, RA0000071, RA0000072,</i>
Advisor	<i>Lane Giles(Teagasc ASSAP), Damien Kingston (Carbery)</i>
Scientist	<i>Paul O'Callaghan</i>
Date	<i>23/01/2023</i>

1 Referral 1:

1.1 Background information

Table 1: Information relating to PAA and waterbody name, draft and referral code, and referral date.

PAA	Waterbody	Draft referral code (LAWPRO excel code)	WFD App Referral code	Referral date
Glan Stream	Glan Stream_010	RA0000031	RA0000031	20/01/2020
Glan Stream	Glan Stream_010	RA0000032	RA0000032	20/01/2020

1.2 Referral evidence and significant issue

Due to the nature of the topography and soils the most intensive farming in the Glan stream PAA is concentrated on the relatively flat ground surrounding the stream and its larger tributaries. While the majority of this area is characterised by mineral soil it is generally poorly draining and a dense drainage network has been created. The phosphate to surface water pollution impact potential maps correspond well to these areas. There are also some areas of peat soil which have been drained and are now intensively farmed. Phosphate is particularly mobile on peat soils and land spreading on these areas should be avoided where possible. Few areas have riparian buffers and in many areas fences are at the edge of waterways with little to no setback. It is obvious that land spreading occurs right up to the edge of the drainage network which are directly connected to the stream. There is little chance for nutrient attenuation and while dissolved phosphate levels do not seem particularly high across much of the catchment (with for some notable exceptions) much of the phosphate load is probably bound up in the extensive plant growth (both algal and macrophytes) obvious across much of the catchment. Educating farmers in best practice for land spreading e.g. remaining 5m back from waterways including drains in conjunction with soil testing and nutrient management planning will be essential particularly when in close proximity to waterways including drains. The area has high average annual rainfall and so care should be taken to spread at most appropriate times. Certain areas e.g. low areas in fields, drains etc. can present a particular risk and land spreading should be avoided in these areas. Buffers particularly in CSAs could contribute significantly to nutrient attenuation

1.3 Measures implemented following advice

Description:

The main issues identified in the referral area were P loss through overland flow, cattle access to streams and organic manure management and storage. Very few areas had riparian buffers in place with fences right up to the edge of waterways. It was also evident that the recommended buffers for land spreading were not being followed. Farmers were asked to improve their use of organic manures by avoiding application at high risk locations at high risk times of the year, while also maintaining recommended buffers. Management of CSA's and prevention of livestock access to watercourses were also key measures recommended.

1.4 PAA Communications

ASSAP supported LAWPRO staff at the public event, organized the stream-side farmers meeting and then carried out 1:1 visits with the majority of active farmers in the PAA. The Streamside event was carried out on the lands of one of the participating farmers. Speakers were present from LAWPRO, as well as ASSAP at the event. A newsletter was written and published about the Glan stream PAA and was sent out to all farmers within the PAA.

1.5 Barriers to implementation of measures

One of the biggest barriers within this region was convincing the land-owners that there was a need for action and helping them to understand which actions were needed and where. Some resistance to building of additional slurry storage due to the financial investment required. Time, money and resources were identified as a potential barrier as a lot of farmers in the area are smaller scale beef farmers working off farm and therefore any large investments may be difficult. Another barrier within the catchment is farm structure with farmers having several land blocks but over applying nutrients on those nearer the farmyard. Due to the high stocking rate on these areas, farmers were slow to implement buffer setbacks due to the loss of earnings by not fertilising/grazing this area.

1.6 Referral 1 Conclusion

In conclusion the issues in this catchment will require significant behavioural change amongst farmers. Ongoing engagement with agricultural advisors is needed to bring about improved land, nutrient and farmyard management changes. Due to the geography of the area some lands are farmed a lot more intensely than others. Agricultural practices have developed here as a result of limited access to reclaimable/lowland near the farmyard, together with easy access to silage ground on outside blocks of land, often too far to make it practicable to draw slurry to them and often outside of the catchment. The result of this is the intensive use of the grazing platform combined with the spreading of slurry from cattle housed back onto these same grazing lands, instead back (as should be the case for nutrient recycling) onto the lands where the silage was grown. The nature of the lowland soils here is such that nutrients are easily lost to surface waters. The derogation rules don't apply here on the intensely farmed lands due to large areas of extensively farmed lands that reduce the overall stocking rate on individual farms. Addressing the miss match in stocking rates on the grazing block and out farms would help to alleviate pressure on water quality.

2 Referral 2:

2.1 Background information

Table 2: Information relating to PAA and waterbody name, draft and referral code, and referral date.

PAA	Waterbody	Draft referral code (LAWPRO excel code)	WFD App Referral code	Referral date
Glan Stream	Glan Stream_010	RA0000034	RA0000034	20/01/2020
Glan Stream	Glan Stream_010	RA0000035	RA0000035	20/01/2020

2.2 Referral evidence and significant issue

Due to the nature of the topography and soils the most intensive farming in the Glan stream PAA is concentrated on the relatively flat ground surrounding the stream and its larger tributaries. While the majority of this area is characterised by mineral soil it is generally poorly draining and a dense drainage network has been created. There are also some areas of peat soil which have been drained

and are now intensively farmed. Phosphate is particularly mobile on peat soils. It is obvious that land spreading occurs right up to the edge of waterways and probably into drains which are directly connected to the stream. There is little chance for nutrient attenuation and while dissolved phosphate levels do not seem particularly high across much of the catchment (with for some notable exceptions) much of the phosphate load is probably bound up in the extensive plant growth (both algal and macrophytes) obvious across much of the catchment. Educating farmers in best practice for land spreading e.g. remaining 5m back from waterways including drains in conjunction with soil testing and nutrient management planning will be essential particularly when in close proximity to waterways including drains. In ditch earthen bunds to slow flow, grassed waterways, sediment traps, wider ditches or flood plains, all designed to slow flow rate of water through the feature. Locate in areas of run off convergence Phosphorous can be attached to sediment. Maintenance and management of drains influences sediment movement. Shallow drain gradient and vegetation is important. Clean in summer and land spread, retain bank vegetation In-drain barriers to block flow and encourage sediment settlement and infiltration.

2.3 Measures implemented following advice

The main issues identified in this referral area were P loss through overland flow, cattle access to streams and organic manure management and storage. The major issue within this referral is the lack of slurry storage and the proximity to surface waters.

Some farmers within this referral improved on farmyard management practices which will have a positive impact on the stream. Farmers were asked to improve their use of organic manures by avoiding application at high risk locations at high risk times of the year, while also maintaining recommended buffers. However some farmers within the catchment didn't agree to put more storage in place due to financial issues, but agreed to follow the recommended buffers when applying nutrients. Farmers agreed also to fence there stock out of the streams.

2.4 PAA Communications

ASSAP supported LAWPRO staff at the public event, organized the stream-side farmers meeting and then carried out 1:1 visits with the majority of active farmers in the PAA. The Streamside event was carried out on the lands of one of the participating farmers. Speakers were present from LAWPRO, as well as ASSAP at the event. A newsletter was written and published about the Glan stream PAA and was sent out to all farmers within the PAA.

2.5 Barriers to implementation of measures

The major barrier to improvement within this referral area is a lack of successors to take over from the existing farmers, together with the age profile of these farmers. These farmers will not invest in slurry storage due to these issues. Cost is also another issue impacting farmers in this referral as many cannot not afford to complete farmyard improvement measures.

2.6 Referral 2 Conclusion

Increased funding to implement measures such as slurry storage and allowing farmers that don't currently have sufficient storage to access this funding. A clear succession system is needed where by a person interested in agriculture who doesn't have access to land would be given an opportunity to develop these farms in an environmentally friendly manner. Ongoing engagement with agricultural advisors is needed to bring about improved farmyard management changes.

3 Referral 3

3.1 Background information

Table 3: Information relating to PAA and waterbody name, draft and referral code, and referral date.

PAA	Waterbody	Draft referral code (LAWPRO excel code)	WFD App Referral code	Referral date
Glan Stream	Glan Stream_010	RA0000071	RA0000071	20/01/2020
Glan Stream	Glan Stream_010	RA0000072	RA0000072	20/01/2020

3.2 Referral evidence and significant issue

A significant area of bog has been drained and converted into improved grassland/pasture. The drain is particularly deep and wide with deep peaty sediment. High levels of ammonium (0.811mg/l-N) are present in the large hydromorphologically modified (straightened, deepened, widened) channel near the confluence with the main stream channel probably due to the drained peat breaking down. This has resulted in a spike in ammonium levels in the main stream channel (0.166mg/l-N) just downstream. Ammonium levels are below the detection limit upstream of where this. As long as peat is allowed to remain dry and therefore exposed to oxygen it will break down releasing nutrients (particularly ammonium) to waterways. The ideal mitigation measure is to rewet the peat. Where this is not feasible raising the water table as much as is possible (by raising the water level in the drain) would likely result in a reduction in the ammonium concentrations.

3.3 Measures implemented following advice

The ideal mitigation measure is to rewet the peat. Where this is not feasible raising the water table as much as is possible (by raising the water level in the drain) would likely result in a reduction in the ammonium concentrations. One of the biggest barriers within this region was convincing the land-owners that there was a need for action and helping them to understand which actions were needed. Following the advice of rewetting the peat land nothing was implemented. Due to time effort and money already put into drainage work they were not prepared to rewet this land or raise the water table within it. One measure which was agreed on was the use of sediment traps when cleaning the drains out to prevent more sediment entering the main channel.

3.4 PAA Communications

ASSAP supported LAWPRO staff at the public event, organized the stream-side farmers meeting and then carried out 1:1 visits with the majority of active farmers in the PAA. The Streamside event was carried out on the lands of one of the participating farmers. Speakers were present from LAWPRO, as well as ASSAP at the event. A newsletter was written and published about the Glan stream PAA and was sent out to all farmers within the PAA.

3.5 Barriers to implementation of measure

The major barrier to improvement within this referral is the perceived drop in income due to a reduced stocking rate. Farmers have spent large amounts of money on land drainage to improve the land productivity over the years. This mitigation action could lead to decreased income due to the reduced ability to carry a high stocking rate on this land. If the land is to be rewetted, which was the advice given, then farmers said "we will have to reduce stock numbers which in turn will lead to a

loss of income". Policy has also been a major barrier here. Farmers up to now have receive nothing for land that's un-reclaimed. This has resulted in them reclaiming/improving it to increase productivity.

3.6 Referral 2 Conclusion

This waterbody requires ongoing engagement with agricultural advisors to highlight the issues in relation to the draining of peat land and the impact it is having on our environment. The farmers within this referral are large scale farmers who will continue to expand, reclaiming more ground to expand their herds. These farmers will need to be financially incentivised to rewet this land.

4 Waterbody conclusion for WFD App (optional)

This waterbody requires ongoing engagement with agricultural advisors with targeted advice towards environmental protection. These farmers also require educational training on environmental sensitive farming practices. Farmers within this catchment are on paper lowly stocked but in reality are highly stocked on lowland which in turn leads to a lower rate of inspections.

Report per Referral Area	
Date	19/01/2023 10:03
PAA Name	Glan
Waterbody name	Glan Stream_010
Referral code	Glan Stream_010

Number of Farms Assessed	42	Issues in the Referral Area	
Dairy	19	P Loss (Diffuse)	Y
Cattle Breeding	8	N Loss (Diffuse)	0
Cattle Other	3	Sedimentation	Y
Sheep	9	Point Source Losses	0
Tillage	0	Toxicity & Pesticides	0
Mixed Farming	2	Ammonium	Y
Other Enterprise	1		
Engaged	41	No. 1st visits	42
Not Engaged	1	No. 2nd visits	25
		No. 3rd visits	4
		No. 4th visits	0

Issue description

Nutrients:

Nutrient enrichment is a problem in the Glan stream. The land is generally poorly draining and therefore phosphate is likely to be the nutrient of most concern but there are also areas of peaty soil and where these are drained, ammonia is likely to be an issue. Landspreading up to the edge of waterways as well as drains poses a particular risk because there is almost no chance of nutrient interception. Fields which are intensively managed are likely to receive high nutrient loads and where these occur along waterways they pose a particular risk. These also tend to have high drainage densities, increasing the risk of nutrient loss further.

Physical issues including sediment:

Issues found in the referral area during ASSAP visit:

		Risk 1	Risk 2	Risk 3
Farmyard Issues				
F1	Slurry Storage	6	2	
F2	Silage Pits and Effluent Storage	3	3	
F3	Loose Housing and FYM Storage	7	4	1
F4	Round Bale storage		4	2
F5	Dirty yards	3	2	
F6	Cattle &/or Sheep handling facilities			
F7	Clean & Grey Water management	1	4	
F8	Drain Connection from Yard to Water	2	1	
F9	Pesticide Storage and handling/Bleach/oil tanks			
F10	Other	3		
Land Management Issues				
LM1	P Loss Through Overland Flow	12	8	5
LM2	N leaching from Light Soils		1	1
LM3	Sediment Loss	3		
LM4	Drinking Points & Stream Fencing	4	11	1
LM5	River Bank Erosion			
LM6	Drain Cleaning & Maintenance		10	7
LM7	Culverts/River Crossings	3		1
LM8	Drinking Troughs		3	4
LM9	Farm Roads and Gateways and underpass	2	12	1
LM10	Unsuitable drainage delivering Nutrient and/or Sediment	1	2	
LM11	Field Boundary Management			
LM12	Bare Land - Inadequate Cover Crops			1
LM13	Reseeding Practices		2	2
LM14	Losses from Tillage operations			1
LM15	Supplementary Feeding and Sacrifice Paddocks		1	1
LM16	Overwintering	1	1	2
LM17	Hill Land grazing		10	5
LM18	Rock Outcrops/Karst Features			2
LM19	Forestry			
LM20	Herbicide / Pesticide and Sheep dip Use			
LM21	Protection of Abstraction Points and Wells			
LM22	Invasive Vegetation			
LM23	Buffers	4	15	4
Physical Management Issues				
NMP1	Preparation and Implementation of NMP	1	6	
NMP2	Achieving appropriate Soil Fertility (lime P&K)		5	7
NMP3	Identify and Manage Critical Source Areas	4		
NMP4	Organic Manure Timing, Location & Method			
NMP5	Recorded Import/Export Organic Manures			
NMP6	Timing - Early & Late N and Phosphorus		4	
NMP7	Fertiliser Rates	1	6	1
NMP8	Correct Management of High OM soils		1	
NMP9	Sloped Fields			
NMP10	Chemical Fertiliser Spreading			
NMP11	Weather and Fertiliser Management			
NMP12	Fertiliser Type		5	1
NMP13	Other			

Mitigation actions recommended in the referral area (note that few actions could have been recommended for one issue):

	Mitigation Actions	Risk 1	Risk 1 - Agreed	Risk 1 - Not Agreed	Not Started	Not Proceeding	Commenced	Complete	Ongoing
Farmyard Issues									
F1	Slurry Storage	Additional storage for farm wastes required	1		1				
F1	Slurry Storage	Improved management of collection and storage of farm wastes	4	3	1				
F1	Slurry Storage	Informing and educating farmers	1	1			1		
F1	Slurry Storage	Separation of clean, grey, soiled and dirty water in farmyard	3	1			1		
F2	Silage Pits and Effluent Storage	Additional storage for farm wastes required	1						1
F2	Silage Pits and Effluent Storage	Improved management of collection and storage of farm wastes	2	1	2				
F3	Loose Housing and FYM Storage	Additional storage for farm wastes required	1	5	2		1		
F3	Loose Housing and FYM Storage	Improved management of collection and storage of farm wastes							
F3	Loose Housing and FYM Storage	Informing and educating farmers							
F4	Round Bale storage	Improved management of collection and storage of farm wastes							
F4	Round Bale storage	Informing and educating farmers							
F5	Dirty yards	Destock/reduce stock for winter							
F5	Dirty yards	Improved management of collection and storage of farm wastes	1		1				
F7	Clean & Grey Water management	Improved management of collection and storage of farm wastes	1	1					
F7	Clean & Grey Water management	Separation of clean, grey, soiled and dirty water in farmyard							
F8	Drain Connection from Yard to Water	Improved management of collection and storage of farm wastes	1	1			1		
F8	Drain Connection from Yard to Water	Informing and educating farmers							
Land Management Issues									
LM1	P Loss Through Overland Flow	Implementation of Nutrient Management Plan							
LM1	P Loss Through Overland Flow	In field grass buffers							
LM1	P Loss Through Overland Flow	Management of Critical Source Areas (CSA's)	2	2					2
LM1	P Loss Through Overland Flow	Prudent P use on Peat soils	9	9					6
LM1	P Loss Through Overland Flow	Riparian Buffers - Fenced/Unfenced	10	10					2
LM2	N leaching from Light Soils	Avoid application at high risk times							
LM2	N leaching from Light Soils	Precision application of nutrients at correct rate							
LM3	Sediment Loss	Appropriate drain maintenance							
LM3	Sediment Loss	Appropriate land reclamation management							
LM3	Sediment Loss	Use of silt fences							
LM4	Drinking Points & Stream Fencing	Informing and educating farmers							
LM4	Drinking Points & Stream Fencing	Prevent livestock access to waters	4	4					
LM6	Drain Cleaning & Maintenance	Allow field drainage system to deteriorate							
LM6	Drain Cleaning & Maintenance	Allow grassed waterways and vegetated ditches							
LM6	Drain Cleaning & Maintenance	Ditch/drain maintenance and management							
LM6	Drain Cleaning & Maintenance	Informing and educating farmers							
LM7	Culverts/River Crossings	Improved farm road/tracks design and location		1			2		
LM7	Culverts/River Crossings	Prevent livestock access to waters		1			1		
LM8	Drinking Troughs	Informing and educating farmers							
LM9	Farm Roads and Gateways and underpass	Improved farm road/tracks design and location	2	2			2		
LM9	Farm Roads and Gateways and underpass	Informing and educating farmers							
LM10	Unsuitable drainage delivering Nutrient and/or Sediment	Ditch/drain maintenance and management							
LM10	Unsuitable drainage delivering Nutrient and/or Sediment	Farm drainage plans							
LM10	Unsuitable drainage delivering Nutrient and/or Sediment	Reduced field drainage and backfill amendment	1						1

LM12	Bare Land - Inadequate Cover Crops	Management of Critical Source Areas (CSA's)			
LM12	Bare Land - Inadequate Cover Crops	Winter - plant cover or catch crops			
LM13	Reseeding Practices	Adopt min till cultivation			
LM13	Reseeding Practices	Adopt spring cultivation			
LM13	Reseeding Practices	Appropriate land reclamation management			
LM14	Losses from Tillage operations	Educate and encourage behavioural change in the use of all sheep dips and footbath solutions			
LM15	Supplementary Feeding and Sacrifice Paddock	Appropriate use of feeders/troughs/out-wintering			
LM16	Outwintering	Appropriate use of feeders/troughs/out-wintering			
LM16	Outwintering	Management of Critical Source Areas (CSA's)	1	1	1
LM17	Hill Land grazing	Appropriate use of feeders/troughs/out-wintering			
LM18	Rock Outcrops/Karst Features	Avoid application at high risk places (CSA's)			
LM23	Buffers	Adhere to buffer zones and safeguard zones	1	1	1
LM23	Buffers	Avoid application at high risk times			
LM23	Buffers	In field grass buffers			
Nutrient Management Issues					
NMP1	Preparation and Implementation of NMP	Avoid application at high risk places (CSA's)			
NMP1	Preparation and Implementation of NMP	Informing and educating farmers	1	1	1
NMP2	Achieving appropriate Soil Fertility (Lime P&K)	Avoid application at high risk times			
NMP2	Achieving appropriate Soil Fertility (Lime P&K)	Implementation of Nutrient Management Plan			
NMP2	Achieving appropriate Soil Fertility (Lime P&K)	Informing and educating farmers			
NMP2	Achieving appropriate Soil Fertility (Lime P&K)	Liming			
NMP2	Achieving appropriate Soil Fertility (Lime P&K)	Nutrient mining			
NMP3	Identify and Manage Critical Source Areas	Avoid application at high risk times	1	1	1
NMP3	Identify and Manage Critical Source Areas	Change from slurry to solid manure	1	1	1
NMP3	Identify and Manage Critical Source Areas	No P on sensitive (CSA's) areas	4	4	4
NMP3	Identify and Manage Critical Source Areas	Precision application of nutrients at correct rate	1	1	1
NMP6	Timing - Early & Late N and Phosphorus	Avoid application at high risk places (CSA's)			
NMP6	Timing - Early & Late N and Phosphorus	Avoid application at high risk times			
NMP6	Timing - Early & Late N and Phosphorus	Informing and educating farmers			
NMP7	Fertiliser Rates	Precision application of nutrients at correct rate	4	4	4
NMP8	Correct Management of High OM soils	Implementation of Nutrient Management Plan			
NMP8	Correct Management of High OM soils	Informing and educating farmers			
NMP8	Correct Management of High OM soils	Precision application of nutrients at correct rate			
NMP8	Correct Management of High OM soils	Prudent P use on peat soils			
NMP9	Sloped Fields	Allow grassed waterways and vegetated ditches			
NMP9	Sloped Fields	Riparian buffers - fenced/unfenced			
NMP11	Weather and Fertiliser Management	Riparian buffers - fenced/unfenced			
NMP12	Fertiliser Type	Implementation of Nutrient Management Plan			
NMP12	Fertiliser Type	Informing and educating farmers			
NMP12	Fertiliser Type	Liming			
NMP12	Fertiliser Type	No P on Index 4 soils			
NMP12	Fertiliser Type	Use of straight fertilisers			