



# Agricultural Sustainability Support and Advisory Programme (ASSAP)

Interim Report #1 | 2018 - 2019





An Roinn Talmhaíochta,  
Bia agus Mara  
Department of Agriculture,  
Food and the Marine



An Roinn Tithíochta,  
Pleanála agus Rialtais Áitiúil  
Department of Housing,  
Planning and Local Government



## Report Content:

	<b>Page</b>
ASSAP Partners	4
Executive Summary	5
<b>1.</b> Ireland's River Basin Management Plan Cycle 2 and Water Policy Changes	<b>6</b>
<b>2.</b> Whole Industry Collaboration and Governance Structures	<b>8</b>
<b>3.</b> LAWPRO Scientists and ASSAP Advisors working in Priority Areas for Action (PAAs)	<b>9</b>
<b>4.</b> Key Performance Indicators and Assessment Information	<b>15</b>

<b>Figures:</b>	<b>Page</b>
<b>1.</b> Co-ordination Structures	<b>8</b>
<b>2.</b> Map of Ireland showing location of the 190 Priority Areas for Action 2018 - 2021	<b>9</b>
<b>3.</b> Graphic showing the Local Catchment Assessment Process	<b>12</b>

<b>Tables:</b>	<b>Page</b>
<b>1.</b> Farmer and Public Engagement	<b>15</b>
<b>2.</b> ASSAP advisor engagement with farmers	<b>15</b>
<b>3.</b> Water quality pressures identified in PAA's	<b>16</b>
<b>4.</b> Farming enterprise assessed	<b>16</b>
<b>5.</b> Issues identified on farm	<b>17</b>
<b>6.</b> Risk rating of issues identified on farms	<b>17</b>
<b>7.</b> Land Management Issues	<b>18</b>
<b>8.</b> Nutrient Management Issues	<b>19</b>
<b>9.</b> Farmyard Management Issues	<b>19</b>
<b>10.</b> Mitigation options for the 20 most frequently selected issues	<b>20</b>

## ASSAP Partners

### **Funded by:**

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Dairy Processing Co-ops - Dairy Sustainability Ireland

### **Co-ordinated by:**

Teagasc  
Dairy Processing Co-ops - Dairy Sustainability Ireland  
LAWPRO

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The ASSAP Co-ordination Team wishes to acknowledge the contribution made to the establishment and implementation of the ASSAP from the farming community and residents farming and living in the selected priority areas for action. Their co-operation and engagement with ASSAP has aided the programme to start the process of improving water quality in their local areas for the betterment of all the community.

The ASSAP Co-ordination Team also wishes to acknowledge the scientific training and expertise provided by the EPA and on-going support from Bord Bia for the programme.

### **Edited by:**

Noel Meehan, ASSAP Programme Manager, Teagasc

## Executive Summary

Under the Water Framework Directive (WFD), Ireland is required to prepare river basin management plans to address national water quality issues every 6 years. However despite having these plans in place the most recent EPA Water Quality Report for 2013-2018 has shown that water quality in Ireland has declined in that period.

Ireland's 2<sup>nd</sup> cycle river basin management plan was published in April 2018. Its key innovation is a change in philosophy to move away from dependence on the regulatory based 'one size fits all' approach, towards being more collaborative, and identifying and implementing 'the right measure in the right place', whilst supporting local communities to get involved in protecting their water resources.

This has given rise to the establishment of a new collaborative approach to improving water quality. An industry and stakeholder collaboration has resulted in the Local Authority Waters Programme (LAWPRO) working with the newly created Agricultural Sustainability, Support and Advisory Programme (ASSAP) in a collaborative process to provide an evidence based approach to pressure identification and farmer focused advice in 190 priority areas for action (PAA's). The ASSAP is supported by the DHPLG, DAFM, Local Authorities, Dairy Processing Co-ops, Farming Organisations and Teagasc.

In order to implement this new approach, intensive training of staff working with LAWPRO and ASSAP in integrated catchment management was undertaken. This resulted in challenging conventional thinking and a broadening of knowledge on water quality pressures in an agricultural context. As a result of this new knowledge base, advisors are now adopting new advisory methods and offer a wide-ranging suite of advice to farmers focused on mitigation actions that will help to reduce pressure impact on water quality.

The ASSAP programme is collaborative and the funding and support received from DAFM, DHPLG and the dairy industry has been critical to allow a new approach to enable local landowners to engage positively in seeking solutions to local problems with the support of a confidential advisory service. Support from the farming organisations for the programme has been very strong and this is vital in communicating and informing farmers about the ASSAP programme and its key messages.

The ASSAP is an agriculture focused approach designed to help the industry improve water quality. The scope of this report is to reflect the actions and measures taken thus far to achieve this.

The initial work undertaken by LAWPRO and ASSAP has been positive. The scientific assessments for each PAA have helped to increase the understanding of the issues affecting water quality from both agricultural and non-agricultural pressures. Diffuse nitrogen, phosphorus and sediment losses account for 75% of the agricultural pressures in PAA's with point sources, pesticides and ammonium contributing the remainder.

The collaborative effort to engage with the farmers and wider community with farming organisation support has led to a very encouraging level of farmer engagement in the programme with 96% of farmers engaging with ASSAP advisors. This has allowed advisors and farmers to work together to put in place farm specific measures to help improve water quality with farmers agreeing to these measures 89% of the time.

However there is much work to be done. Improvements in water quality will require the implementation of actions and measures at farm level over a sustained period of time.

Maintaining these water friendly practices and behaviours with the support of all agricultural advisors and the wider Agricultural Knowledge and Innovation Systems (AKIS) will be key to ensuring long term improvements in water quality.

It is in everyone's interest to work together to improve Ireland's overall water quality. This will have many benefits across the local community and will assist with achieving Ireland's obligations under the Water Framework Directive. It will also help to strengthen agriculture by reinforcing our green image as food producers and underpin the future development of sustainable Irish agriculture.



# 1: Ireland's River Basin Management Plan Cycle 2 and Water Policy Changes

In Ireland all water policy and management is guided by the Water Framework Directive. Under this directive Ireland has been set a target of achieving at least 'good status' for all waters in Ireland, along with no deterioration. However, despite a lot of good work over the last 20-30 years we are falling short in achieving this target and water quality has declined in recent years.

Although overall water quality in Ireland compares favourably to the EU average, meeting objectives under the Water Framework Directive, whereby all waterbodies achieve good status by 2027, will be challenging.

The results from the latest Environmental Protection Agency (EPA) Water Quality in Ireland 2013-2018 report are disappointing. The report highlights that 52.8% of surface waterbodies are at good or high status, down from the 55.4% recorded for the 2010-2015 period.

However an encouraging result is the net improvement of 16.7% in water quality in water bodies that were prioritised areas for action and reflects the positive efforts of local authorities and other public bodies.

The key issue is eutrophication, driven by excess phosphorus in freshwaters and excess nitrogen in estuarine and marine waters. Changes to the physical habitat including excess sediment (hydro morphology) are the next biggest issue. Agriculture is the most significant pressure, followed by urban discharges, channel maintenance and other physical habitat changes, forestry, peat cutting and domestic waste water. Diffuse pollution is widespread and presents the greatest challenge.

Under the WFD, Ireland must develop river basin management plans to address these issues every 6 years. The first plan proved less effective than expected and resulted in no net improvement in water quality, despite significant investment in agri-environmental schemes, on-farm storage and urban waste water treatment.

Three key learning's from the first plan were used to shape a new approach for the second plan:

1. Inadequate governance structures resulted in no clear leadership or mechanisms for delivery
2. Multiple river basin districts led to disjointed and ineffective planning and implementation
3. Targets and objectives were too ambitious and were not founded on a solid evidence base.

These key learnings provided the basis for Ireland's 2<sup>nd</sup> cycle river basin management plan published in April 2018. The plan moved towards a more collaborative and engagement based approach with stakeholders. Implementing the 'right measure in the right place' provides a focus for actions to improve water quality.

Three new interlinked teams have been established to progress actions in 190 priority areas. They will investigate the issues at a local scale, collaborate with other public bodies and farmers to have specific measures implemented, and engage with the public and landholders.

The Agricultural Sustainability, Support and Advisory Programme (ASSAP) has been formed to work with the Local Authority Waters Programme (LAWPRO\*) to provide an evidence based approach to pressure identification and farmer focused advice in the 190 PAA's.

*\*Note LAWPRO contains two teams, the Communities Team and the Catchments Team.*

### **Communities Team:**

This team consists of three Coordinators and 13 Community Water Officers working from various Local Authority centres. It supports communities and stakeholders in the delivery of local water quality projects and initiatives. The team also works with rivers trusts and catchment partnerships, which are emerging across the country.

### **Catchment Assessment Team:**

This team was established in 2018 and consists of scientists with a wide range of technical expertise. They are assisting in the implementation of Integrated Catchment Management (ICM) across the 190 Priority Areas for Action aimed at improving water quality. This involves river assessments and stream walks to understand the issues affecting water quality. Working with local communities, landowners, business owners and public bodies, this team develops relevant and workable solutions. The LAWPRO catchment assessment teams provide scientific information and support which combined with ASSAP Advisors knowledge forms the basis for advisor engagement with farmers in the PAA's.



## 2: Whole Industry Collaboration and Co-ordination Structures

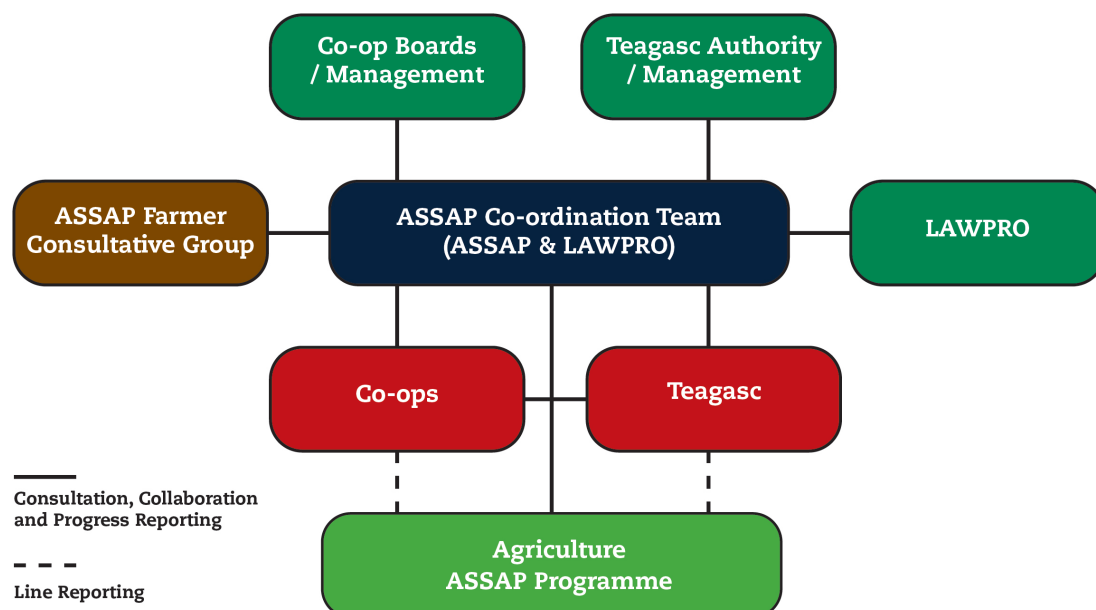
A new collaborative initiative between government and industry called the Agricultural Sustainability, Support and Advisory Programme (ASSAP) has been put in place for the RBM cycle 2 2018-2021 to support the implementation of best practice at farm level in 190 Priority Areas for Action (PAA's) to address existing agricultural pressures on water quality.

The collaboration is crucial to ensuring that the ASSAP can aid in the collective goal of achieving 'good status' for waters in Ireland. It will also help to strengthen agriculture by reinforcing our green image as food producers and underpin the future development of sustainable Irish agriculture.

The programme is fundamentally based on strong collaborative principles. The funding for the ASSAP is provided jointly by the DHPLG, DAFM and Dairy Processing Co-ops - Dairy Sustainability Ireland while Local Authorities have established LAWPRO. Advisory services are provided jointly by Teagasc and the Dairy Processing Co-ops. The ASSAP has received strong support from the main farming organisations.

From the outset, engaging with all key stakeholders; Government departments and regulators, advisory services, farmer representative organisations and industry partners has ensured that a robust governance and operational structure is in place to manage and implement the ASSAP.

**Figure 1: Co-ordination structures**



### 3: LAWPRO Scientists and ASSAP Advisors working in Priority Areas for Action (PAA's)

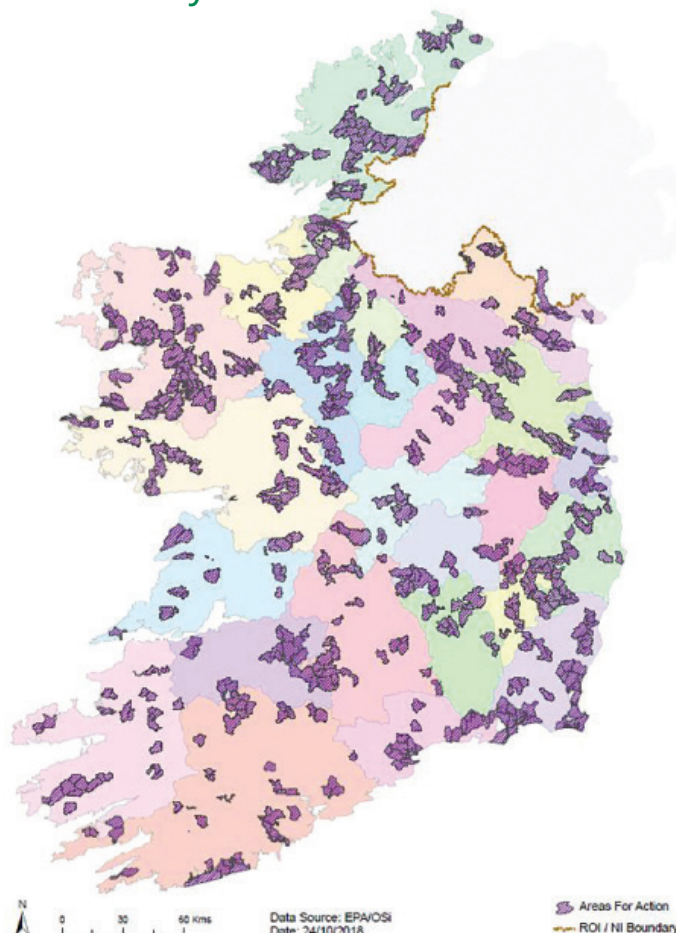
The focus of the ASSAP is to combine both catchment specific science, provided by LAWPRO catchment assessment team and a tailored advisory service to farmers on protecting water quality provided by 29 programme advisors. The implementation of this combined approach is outlined below.

#### LAWPRO:

The Local Authority Waters Programme (LAWPRO) was established as part of the Local Authority response to their obligations under the EU Water Framework Directive, the enabling Irish legislation and the River Basin Management Plan for Ireland (2018-2021) (RBMP). It is a shared service, managed jointly by Kilkenny and Tipperary County Councils. The Programme employs 60 specialist staff across a range of scientific, community engagement and other disciplines. They are based in 13 Local Authority offices across the country. The catchment assessment team is focused on delivering water quality improvements in the 190 priority areas for action (PAAs) that are detailed in the RBMP.

Detailed information about LAWPRO is available from [www.watersandcommunities.ie](http://www.watersandcommunities.ie). Further details on the 190 PAAs are available from [www.catchments.ie](http://www.catchments.ie).

**Figure 2: Map of Ireland showing location of the 190 Priority Areas for Action 2018-2021**



## **Catchment Characterisation:**

These 190 areas for action were selected through a national characterisation process that was led by EPA in conjunction with Local Authorities (including LAWPRO) and IFI and finalised at workshops with all public bodies. The PAA's comprise 726 water bodies that have multiple pressures including agriculture, urban discharges, channel maintenance and other physical habitat changes, forestry, peat cutting and domestic waste water. Agriculture is a significant pressure in 359 water bodies.

PAA's were selected based on the following two-step selection criteria:

### **Step 1 – Prioritisation based on national priorities in the RBMP**

1. Complying with existing EU legislation (such as Urban Waste Water Treatment)
2. Preventing deterioration in water quality
3. Meeting water quality objectives for designated “Protected Areas” such as bathing waters and shellfish waters
4. Protecting High Status waters
5. Implementing targeted actions and pilot schemes in focused catchments

### **Step 2 – Taking a pragmatic approach**

1. Fair distribution (all local authorities should be involved)
2. Headwaters first
3. Addressing multiple pressures together
4. Sub catchment projects (where issues exist in multiple sub catchments)
5. Building on existing programmes and community group initiatives
6. Building on water quality improvements that are already happening
7. Looking at both quick wins and longer-term challenges

### **Catchment Assessment Teams:**

The catchment assessment teams are based in 5 regions (Border, Midlands & Eastern, South East, South West and West) and each regional team has 6 scientists of various disciplines, including agricultural scientists, working under a Catchments Manager. In addition, there is a Blue dot scientist based in the West region focused on developing and coordinating measures in High Status catchments.

The teams carry out scientific assessments in the PAAs at a local level to drive the implementation of local mitigation measures. One of their key objectives is to implement 'the right measure in the right place' strategy. To do this, the teams gather the scientific evidence to support decision-making and communicate it in non-technical terms to effect behavioural change.

### **Local Catchment Assessment Process:**

There are several stages in the local catchment assessment process. It commences with a desk top study, where all the existing available data on a PAA is gathered and assessed. The study analyses historical water quality data, looks at potential sources of pollution, identifies possible pathways for pollution to reach the receptor which is the watercourse. The study also identifies any data gaps or gaps in understanding of how water flows in the catchment and how activities are impacting on it.

Once the study is substantially complete, the local community is invited to a meeting where the findings are presented. Community feedback and local knowledge is sought to further inform the process. The meeting also updates the community on progress since the RBMP was adopted in 2018. As much of the fieldwork requires access to land, where agriculture is a significant pressure a further water side meeting is organised by the ASSAP advisors with farmers in the area. This allows further specific engagement on potential agricultural issues.

**Figure 3: Graphic showing the Local Catchment Assessment Process**



Any new information received through the consultation processes is included in the desk study. The next step on the process is to plan and prepare for PAA visits incorporating fieldwork. Fieldwork involves systematically working through the catchment, recording presence and abundance of macroinvertebrates and macroalgae. Field parameters are also measured, where required water samples are taken for chemical analysis, and the physical condition of the river is assessed. All these can help improve the understanding of what is happening in a river catchment and if it is affected by pollution. This will help identify what the water quality pressures are in a PAA. The typical pressures found in PAA's are diffuse phosphorus (P), nitrogen (N) and sediment losses, point sources, toxicity and pesticides and ammonium.

## **Referrals:**

As the catchment teams move through a catchment, they may refer various issues to the ASSAP advisor as they come across them. Once the fieldwork is complete and analysed, the lead scientist will write a report on the findings. Formal referrals to ASSAP will then take place using the EPA's on-line WFD Application. All the referrals taken together, to ASSAP and implementing bodies, form the action plan for the catchment. In the case of agriculture, the measures to be implemented will be agreed between the farmer and the advisor. Any non-agricultural issues identified are referred to the relevant competent Authority, for example; a septic tank issue is referred to the relevant Local Authority.

## **ASSAP Advisors:**

There are 29 ASSAP advisors delivering the programme at farm level. Teagasc provides 20 advisors and the dairy processing co-ops provide 9 advisors.

The roles of the ASSAP advisor is to compliment the scientific work of LAWPRO by:

- providing farmers with a free, confidential and voluntary advisory service,
- provide farm specific assessments and plans to prevent the loss of nutrients, sediment and pesticides from entering waters
- to disseminate key water quality messages to the wider agricultural community.

## **Local Catchment Assessment Process:**

ASSAP advisors have developed excellent working relationships with the LAWPRO teams in their areas and this has benefitted the implementation of the programme as a whole. The two way interaction between the scientists evaluating streams and advisors providing the agricultural context has fostered an increased understanding and appreciation of the complex nature of protecting waters from nutrient and sediment losses.

## **ASSAP Advisory Service:**

The purpose of the farm visit is to meet with the farmer and assess his/her farm for any potential issues that may be having an effect on the water quality in the local watercourse. In general an advisor will assess the farm under three categories; land management, nutrient management and farmyard management.



At the end of a visit the advisor and farmer will agree on how best to focus improvements or mitigation actions, if any are required, on his/her farm. The practical advice will be designed to 'break the pathway' and prevent nutrients, sediment and pesticides from entering water.

A written farm plan detailing advice and actions will be provided to the farmer and a timeframe for completion agreed. Advisors will revisit farms where necessary to aid with the implementation of mitigation actions.

### **Dissemination:**

Much effort has gone in to informing the wider agricultural community of the importance of protecting and enhancing our waters and the ASSAP Advisors have participated and contributed to a wide variety of extension platforms to ensure that the widest audience possible is reached.

- Community and farmer information meetings
- Industry open days and events
- Stakeholder conferences
- Discussion groups
- Newspapers/ magazine articles/ newsletters
- Social media/ websites
- National working groups
- Research steering committees

## 4: Key Performance Indicators and Assessment Information

### LAWPRO KPI's:

By the end of 2019, LAWPRO had 121 of the 190 desk studies underway, 111 community meetings held, 90 fieldwork assessments underway, 24 catchment reports in preparation and 45 action plans in preparation. Further detail about LAWPRO's work is available from their website at [www.watersandcommunities.ie](http://www.watersandcommunities.ie) and from [www.catchments.ie](http://www.catchments.ie).

### ASSAP KPI's:

#### Farmer and Public Engagement:

A key element of the ASSAP is to ensure the general public in a PAA is aware of the issues with water quality and the solutions available to improve the current status of waters. Also, as farmers are the majority land owners in PAA's they play a vital role in helping to improve water quality in the area. Significant resources are put into providing farmers with an opportunity to interact with the ASSAP and LAWPRO staff and to discuss issues affecting water quality. The number and type of engagement with farmers and the public are recorded below:

**Table 1: Farmer and Public Engagement**

Community meetings (Led by LAWPRO)	111
Farmer meetings (Led by Teagasc)	77
Discussion group meetings	160
PAA's active	68

#### Farm Advisory Engagement:

Where water quality in a PAA is at risk from agricultural activity, farmers are offered a free and confidential farm visit from an ASSAP advisor with relevant figures detailed below:

**Table 2: ASSAP advisor engagement with farmers**

Advisor / farmer contacts	1,652
Farm assessments completed 31 <sup>st</sup> December 2019	1,168
Farmer engagement with programme	96%
Actions agreed between advisor and farmer	89%

## Water quality pressures in PAA's

The fieldwork conducted by LAWPRO is crucial to identifying what the main pressures on water quality are in a PAA. These pressures have the potential to cause deterioration in water quality. Once these have been identified advisors can use this information as the basis for preparing mitigation plans for farmers designed to help improve water quality.

To date diffuse P, N and sediment losses account for 75% of the pressures identified in PAA's where investigations have occurred.

**Table 3: Water quality pressures identified in PAA's**

P Loss (Diffuse)	32%
N Loss (Diffuse)	16%
Sedimentation	27%
Point Source Losses	15%
Toxicity and Pesticides	7%
Ammonium	4%

## Farming Enterprise:

The ASSAP advisory service is available to all farmers in a PAA. The breakdown of farms assessed is shown below:

**Table 4: Farming enterprise assessed**

Cattle Breeding	27%
Dairy	27%
Mixed Farming	20%
Cattle Other	16%
Sheep	6%
Tillage	2%
Other Enterprise	2%

## Farm Assessment Analysis:

The ASSAP advisor assesses farms under three categories:

- land management;
- nutrient management;
- farmyard management.

The advisor identifies areas of the farm and the farming activities with potential to cause nutrient, sediment or pesticide losses to waters and discusses mitigation actions to remedy the issues identified.

**Table 5: Issues identified on farm**

Total number of issues identified in farm assessments	6,751
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The issues identified on farm are given a risk rating:

**Table 6: Risk rating of issues identified on farms**

High	Issues that are likely to have a <b>high</b> impact on water quality
Moderate	Issues that are likely to have a <b>moderate</b> impact on water quality
Low	Issues that are likely to have a <b>low</b> impact on water quality

The assessment of a farm covers 46 different issues. On average there is 6 issues identified per farm. The advisor gives these issues a risk rating, (high, moderate or low), depending on how likely the issue is to impact water quality.

Each of these issues and associated risk are identified per category in tables 7, 8 and 9.

**Table 7: Land Management Issues**

Land management practices account for 44% of the issues identified. These are practices that contribute to nutrient, sediment and pesticide losses to waters:

Land Management Issues	High	Moderate	Low	Total
P loss through overland flow	289	191	41	521
Buffers	207	167	38	412
Drinking points and stream fencing	190	148	63	401
Herbicide/pesticide and sheep dip use	104	78	24	206
Drain cleaning and maintenance	106	64	28	198
Sediment loss	119	55	11	185
N leaching from light soils	97	63	20	180
Farm roads, gateways and underpass	72	51	11	134
Drinking troughs	28	40	41	109
Reseeding practices	20	47	20	87
Out wintering	18	37	21	76
Field boundary management	30	17	18	65
River bank erosion	42	14	7	63
Hill land grazing	10	41	9	60
Supplementary feeding and sacrifice paddocks	14	28	11	53
Culverts/river crossings	25	19	7	51
Unsuitable drainage delivering nutrient and/or sediment	25	17	2	44
Rock outcrops/karst features	15	17	4	36
Bare land - inadequate cover crops	19	5	1	25
Protection of abstraction points and wells	8	9	7	24
Forestry	8	8	4	20
Presence of invasive vegetation	9	6	5	20
Losses from tillage operations	2	3	1	6

**Table 8: Nutrient Management Issues**

Nutrient management practices account for 35% of the issues identified. These are practices that contribute to nutrient and sediment losses to waters:

Nutrient Management Issues	High	Moderate	Low	Total
Preparation and implementation of NMP	246	157	62	465
Organic manure timing, location and method	193	139	39	371
Achieving appropriate soil fertility (Lime, P&K)	132	141	31	304
Weather and fertiliser management	120	100	34	254
Identify and manage Critical Source Areas (CSA's)	118	95	12	225
Timing - early and late N and P	81	73	21	175
Sloped fields	50	85	40	175
Fertiliser type	67	64	32	163
Chemical fertiliser spreading	39	44	19	102
Correct management of high organic matter soils	17	25	30	72
Fertiliser rates	18	19	13	50
Other (Specify)	10	7	3	20
Recorded import/export of organic manures	3	3	3	9

**Table 9: Farmyard Management Issues**

Farmyard management practices account for 21% of the issues identified. These are practices that contribute to nutrient, sediment and pesticide losses to waters:

Farmyard Management Issues	High	Moderate	Low	Total
Clean and grey water management	120	93	77	290
Loose housing and FYM storage	112	89	55	256
Round bale storage	66	86	55	207
Silage pits and effluent storage	93	40	20	153
Dirty yards	69	64	11	144
Slurry storage	54	42	29	125
Pesticide storage and diesel/oil tanks	13	46	21	80
Drain connection from yard to water	48	20	6	74
Cattle and/or sheep handling facilities	8	16	20	44
Other (Specify)	5	9	3	17



## Mitigation Actions and Farm Plan:

Each issue identified has a number of mitigation actions that farmers can implement to alleviate the problem identified. These options will be discussed with the farmer and appropriate mitigation actions selected. These actions form the basis for the farm plan and a time frame for implementation is agreed. Information on the type of mitigation actions recommended to farmers for the 20 most frequent issues identified is outlined in table 10:

*\*Note advisors may recommend multiple mitigation actions for an issue identified on farm.*

**Table 10: Mitigation options for the 20 most frequently selected issues**

<b>1</b>	<b>P Loss Through Overland Flow</b>	<b>700</b>
	Management of Critical Source Areas (CSA's)	233
	Riparian Buffers - Fenced/Unfenced	192
	In field grass buffers	112
	Implementation of Nutrient Management Plan	50
	Establish field boundaries and hedges	34
	Improved farm road/tracks design and location	21
	Prudent P use on Peat soils	16
	Alleviate compacted areas in fields	13
	No P on sensitive (CSA's) areas	10
	Other mitigation measures	19
<b>2</b>	<b>Preparation and implementation of NMP</b>	<b>555</b>
	Precision application of nutrients at correct rate	267
	Informing and educating farmers	202
	Avoid application at high risk times	36
	Avoid application at high risk places (CSA's)	32

<b>3</b>	<b>Buffers</b>	<b>596</b>
	Adhere to buffer zones and safeguard zones	341
	Avoid application at high risk times	76
	Informing and educating farmers	76
	Avoid application at high risk places	45
	Riparian Buffers - Fenced/Unfenced	43
	In field grass buffers	8
	Establish field boundaries and hedges	7
<b>4</b>	<b>Drinking Points &amp; Stream Fencing</b>	<b>439</b>
	Prevent livestock access to waters	322
	Informing and educating farmers	117
<b>5</b>	<b>Organic Manure Timing, Location &amp; Method</b>	<b>597</b>
	Avoid application at high risk times	244
	Avoid application at high risk places (CSA's)	113
	Informing and educating farmers	90
	Adopt latest manure application techniques	79
	Precision application of nutrients at correct rate	52
	Other mitigation measures	19
<b>6</b>	<b>Achieving appropriate Soil Fertility (Lime P&amp;K)</b>	<b>445</b>
	Implementation of Nutrient Management Plan	186
	Liming	108
	Informing and educating farmers	77
	Precision application of nutrients at correct rate	49
	No P on index 4 soils	17
	Other mitigation measures	8
<b>7</b>	<b>Clean &amp; Grey Water Management</b>	<b>351</b>
	Separation of clean, grey, soiled and dirty water in farmyard	234
	Informing and educating farmers	61
	Improved management of collection and storage of farm wastes	53
	Additional storage for farm wastes required	3

<b>8</b>	<b>Loose Housing and FYM Storage</b>	<b>298</b>
	Improved management of collection and storage of farm wastes	191
	Informing and educating farmers	52
	Separation of clean, grey, soiled and dirty water in farmyard	32
	Additional storage for farm wastes required	20
	Destock/reduce stock for winter	3
<b>9</b>	<b>Weather and Fertiliser Management</b>	<b>348</b>
	Avoid application at high risk times	173
	Informing and educating farmers	100
	Avoid application at high risk places (CSA's)	42
	Riparian buffers - fenced/unfenced	29
	Other mitigation measures	4
<b>10</b>	<b>Identify and Manage Critical Source Areas</b>	<b>318</b>
	Management of critical source areas (CSA's)	104
	Avoid application at high risk times	103
	Precision application of nutrients at correct rate	46
	Informing and educating farmers	39
	No P on sensitive (CSA's) areas	26
<b>11</b>	<b>Round Bale Storage</b>	<b>215</b>
	Improved management of collection and storage of farm wastes	73
	Informing and educating farmers	87
	Separation of clean, grey, soiled and dirty water in farmyard	52
	Additional storage for farm wastes required	2
	Destock/reduce stock for winter	1
<b>12</b>	<b>Herbicides &amp; Pesticides</b>	<b>228</b>
	Adhere to buffer zones and safeguard zones	106
	Spraying equipment and operator fit for purpose	31
	Best practice when storing and handling pesticides	29
	Avoid application at high risk times and high risk places	28
	Promote integrated pest management	25
	Other mitigation measures	9

<b>13</b>	<b>Drain Cleaning &amp; Maintenance</b>	<b>231</b>
	Ditch/drain maintenance and management	93
	Allow grassed waterways and vegetated ditches	74
	Informing and educating farmers	46
	Farm drainage plans	10
	Other mitigation measures	8
<b>14</b>	<b>Sediment Loss</b>	<b>305</b>
	Riparian Buffers - Fenced/Unfenced	53
	Prevent livestock access to waters	37
	Establish field boundaries and hedges	30
	In field grass buffers	22
	Appropriate drain maintenance	21
	Improved farm road/tracks design and location	18
	Use of silt fences	17
	Other mitigation measures	52
<b>15</b>	<b>N leaching from Light Soils</b>	<b>274</b>
	Avoid application at high risk times	109
	Precision application of nutrients at correct rate	53
	Implementation of Nutrient Management Plan	30
	Winter - plant cover or catch crops	27
	Urease inhibitors	22
	Avoid application at high risk places (CSA's)	11
	Informing and educating farmers	7
	Use of clover	6
	Adopt spring cultivation	5
	Other mitigation measures	4
<b>16</b>	<b>Timing - Early &amp; Late N and Phosphorus</b>	<b>246</b>
	Avoid application at high risk times	99
	Informing and educating farmers	43
	Precision application of nutrients at correct rate	43
	Adopt latest manure application techniques	34
	Avoid application at high risk places (CSA's)	27

<b>17</b>	<b>Sloped Fields</b>	<b>265</b>
	Avoid application at high risk times	71
	Avoid application at high risk places (CSA's)	64
	Informing and educating farmers	60
	Riparian buffers - fenced/unfenced	31
	Precision application of nutrients at correct rate	21
	Other mitigation measures	18
<b>18</b>	<b>Fertiliser Type</b>	<b>217</b>
	Informing and educating farmers	91
	Implementation of Nutrient Management Plan	57
	Use of straight fertilisers	45
	Liming	16
	Other mitigation measures	8
<b>19</b>	<b>Silage Pits and Effluent Storage</b>	<b>205</b>
	Improved management of collection and storage of farm wastes	117
	Separation of clean, grey, soiled and dirty water in farmyard	48
	Informing and educating farmers	37
	Additional storage for farm wastes required	3
<b>20</b>	<b>Dirty yards</b>	<b>177</b>
	Improved management of collection and storage of farm wastes	77
	Separation of clean, grey, soiled and dirty water in farmyard	61
	Informing and educating farmers	26
	Additional storage for farm wastes required	8
	Destock/reduce stock for winter	5

*\*Note “informing and educating farmers” action is selected where the advisor helps to increase the farmers understanding and knowledge of the issue identified and the reasons for implementing relevant mitigation actions.*

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