

Gap Analysis Interim Briefing Note

Introduction

This interim briefing note has been prepared by the EPA Catchments Unit for DHLGH. The aim of this interim briefing note is to provide an overview of the number of waterbodies that are impacted by activities relevant to DAFM, and to highlight the issues (e.g. P, N, sediment) that measures must target to improve water quality and meet Water Framework Directive (WFD) environmental objectives. Assuming all necessary measures are implemented, the note also provides a projection on the number of waterbodies where water quality can be improved and also the number of waterbodies where these measures will lead to waterbodies achieving their environmental objective.

As the note is an interim note, and the analysis is based on draft characterisation data and draft Pollution Impact Potential maps, some values may change, but overall the document provides a general overview of the extent of action that is required and what this action can achieve.

This note focuses on three distinct sections relevant to DAFM: Agriculture, Forestry and Land drainage/Channelisation.

Context

- Under the Water Framework Directive all waterbodies (wbs) are required to achieve an environmental objective of at least Good ecological status by 2027,
- In total there are 4842 wbs and currently 1665 wbs (35%) are *At Risk* of not meeting their environmental objectives.
To achieve these environmental objectives in the 1665 *At Risk* wbs, measures are required to be implemented in all *At Risk* waterbodies, and for some estuaries, measures are also required upstream.
- For activities relevant to DAFM, measures are required in:
 - 1282 wbs, to be implemented by the agricultural sector,
 - 254 wbs, to be implemented by the forestry sector, and
 - 369 wbs to address impacts from land drainage/channelization.

Agriculture

This section covers agriculture and outlines the scale of issues that are impacting on water quality and where measures should be targeted.

An overview is provided in Table1 with a summary explanation of the figures provided below.

Table 1 : Summary of measures required for agriculture, issues to target, and projected improvements

| No of WBs where Agricultural measures are required | Single Pressures | Multiple Pressures | Issues identified | No of WBs where measures are required to mitigate issue* | No of WB improvements that the agricultural sector can achieve | No of WB Environmental Objectives (at least Good status) that the agricultural sector can solely achieve |
|---|------------------|--------------------|-------------------------|--|--|--|
| 1282 | 518 | 764 | Phosphorus ** | 907 | 1013 | 327 |
| | | | Nitrogen | 421 | | |
| | | | Sediment | 148 | | |
| | | | Pesticides – Sheep Dip | 45 | | |
| | | | Pesticides impacting DW | 27 | | |
| <p>*There may be multiple issues in a waterbody so numbers do not equal no of wbs impacted by agriculture ** Peaty (poorly draining) soils are found in 80 wbs (9% of wbs) with phosphorus issues so different measures may be needed for these wbs compared to wbs with phosphorus issues on more freely draining soils</p> | | | | | | |

- Of the 1282 wbs where agricultural measures are required, 764 wbs (60%) are impacted by multiple pressures. This means that in addition to agriculture there are other sectors that are impacting on water quality. For example, a waterbody may be impacted by agriculture, forestry, urban waste water and industry. This means that all sectors must be involved in implementing measures before the environmental objective can be achieved. However, if the agricultural sector is the only sector to implement measures this will still result in water quality improvement in all 1013 waterbodies but will not be sufficient to get the full extent of improvement required to reach their environmental objective threshold in all 1013 wbs without action from other sectors.
- Of the 1282 wbs where agricultural measures are required, 518 wbs (40 %) are impacted by only agriculture and therefore have single pressures impacting on them. If the agricultural sector implements appropriate measure(s) 327 of the 1013 waterbodies will not only improve but should achieve their environmental objectives.
- In relation to agriculture, note that measures may be required in more than one waterbody to get improvement in a waterbody. For example, to achieve environmental objectives in an *At Risk* Estuary measures may be required upstream in *Not at Risk* waterbodies as well as in the *At Risk* Estuary. This applies, in particular, to N measures.
- For the agricultural sector there are a number of issues impacting on water quality and these are impacts from:
 - Phosphorus, including phosphorus issues on organic (very poorly draining) soils,
 - Nitrogen,
 - Sediment
 - Pesticides related to sheep dip, and
 - Pesticides impacting drinking water supplies

- The issues from the agricultural sector impacting water quality have been broken down in Table 1. The associated numbers indicate the scale of issues that measures need to target. For example, the highest proportion of impact from agricultural activity is a result of phosphorus and therefore the largest proportion of agricultural measures will be required to target phosphorus, followed by measures required to target nitrogen, sediment and pesticides. Examples of the types of actions that could potentially be implemented as measures are shown in Table 2.
- As mentioned above, even in waterbodies where agriculture is the only sector impacting water quality, there may be multiple issues impacting on the waterbody. For example, in the 518 wbs where agriculture is the only sector impacting water quality, 399 wbs are impacted by one issue meaning one measure type may be sufficient to address this one issue. Whereas 119 wbs are impacted by two or more issues (e.g. phosphorus and/or pesticides and/or nitrogen) and this means that is likely that a suite of measures will be required to target these waterbodies with multiple issues.
- If appropriate measures are implemented in all waterbodies where agriculture is impacting water quality (assuming no action is taken by any other sectors) there will be improvements in 1013 wbs, of which 327 of these waterbodies should achieve their WFD environmental objective.
- When selecting a suitable suite of measures for agriculture consideration, and where appropriate, priority should be given to measures that can deliver water quality improvements and also benefit, for example, biodiversity, climate, flood alleviation and/or wellbeing.

Table 2: Examples of extent of measures required to address individual issues

| Issues impacting water quality | No of incidences of issues impacting water quality | Example of potential measures required to address issue |
|---------------------------------------|---|--|
| Phosphorus/sediment | 827/148 | 200,000 pathway interception measures (2,500 km length of channel) |
| Phosphorus on Peaty Soils | 80 | 124,000 ha rewetting. Could be prioritised to target biodiversity outcomes |
| Nitrogen | 421 | Reduction of 23,000 – 36,000 tonnes N in our watercourses. Based on current farming practices in the key catchments, that is estimated to be equivalent to a reduction in 80,000 -126,000 tonnes N. This reduction would need to be targeted in the N critical source areas to be effective) |
| Sheep Dip | 43 | Focused awareness campaigns, inspections, disposal schemes in 43 waterbodies |
| Pesticides impacting drinking water | 27 | Focused awareness campaigns, inspections, disposal schemes in 27 waterbodies |

Forestry

The following section outlines the scale of issues from forestry activities that are impacting on water quality and where measures should be targeted.

An overview is provided in Table 3 with a summary explanation of the figures provided below.

Table 3: Summary of measures required for forestry, issues to target, and projected improvements

| No of WBs where Forestry measures are required | Single Pressures | Multiple Pressures | Issues identified | No of WBs where measure needs to mitigate issue* | No of WB improvements that the forestry sector can achieve | No of WB Environmental Objectives (at least Good status) that the forestry sector can solely achieve |
|---|------------------|--------------------|--|--|--|--|
| 254 | 57 | 197 | Physical alteration | 128 | 254 | 57 |
| | | | Nutrients | 125 | | |
| | | | Sediment | 66 | | |
| | | | Changes to water flow and/or water level | 20 | | |
| *There may be multiple issues in a waterbody so numbers do not equal no of wbs impacted by forestry | | | | | | |

- Of the 254 wbs where forestry measures are required, 197 wbs (77%) are impacted by multiple pressures. This means that, along with forestry, there are other sectors that are impacting on water quality. For example, a waterbody may be impacted by agriculture, forestry, urban waste water and industry. This means that all sectors must be involved in implementing measures before the environmental objective will be achieved. However if, for example, the forestry sector is the only sector to implement measures this could still result in a waterbody improvement in all 254 wbs but will not be sufficient to get the full extent of improvement required in 197 wbs to reach their environmental objective threshold.
- However, of the 254 wbs where forestry measures are required, 57 wbs (23%) are impacted by only the forestry sector (single pressure). This means that forestry is the only sector impacting on the waterbody and that implementation of appropriate measure(s) by the sector should result in 57 wbs achieving their environmental objectives.
- For the forestry sector there are a number of issues impacting on water quality and these are impacts are a result of:
 - Physical alterations to the habitat
 - Nutrients,
 - Sediment, and
 - Changes in water level and/or flow
- The issues from the forestry sector impacting water quality have been broken down in Table 3. These associated numbers indicate the scale of issues that measures need to target. For

example, the highest proportion of impacts from forestry activities are as a result of physical alterations and therefore the largest proportion of forestry measures will be required to target these impacts, closely followed by measures needed to target impacts from nutrients and sediment.

- In waterbodies where forestry is the only sector impacting water quality, there may be multiple issues impacting on the waterbody. For example, in 57 wbs where forestry is the only sector impacting water quality, 33 wbs are impacted by one issue meaning one measure type may be sufficient to target this one issue. Whereas 24 wbs are impacted by two or more issues and this means that it is likely that a suite of measures will be required to target these waterbodies.
- Assuming no action is taken by any other sector, if appropriate measures are implemented in all waterbodies where forestry activities are impacting water quality there will be improvements in 254 wbs, of which 57 wbs should achieve their WFD environmental objectives.
- Further work with the Forest Service and Coillte is required to determine the type and extent of specific forestry measures that might be required in each of the relevant waterbodies.
- When selecting a suitable suite of measures for forestry consideration and, where appropriate, priority should be given to measures that can deliver water quality improvements and also benefit, for example, biodiversity, climate, flood alleviation and/or wellbeing.

Land drainage/Channelisation

The following section on land drainage/channelization outlines the scale of issues that are impacting on water quality and where measures should be targeted.

An overview is provided in Table 4 with a summary explanation of the figures provided below.

Table 4: Summary of measures required to address land drainage/channelization, issues to target, and projected improvements

| No of WBs when measures for drainage/ Channelization are required | Single Pressures | Multiple Pressures | Issues identified | No of WBs where measure needs to mitigate issue* | No of WB improvements that can be achieved | No of WB Environmental Objectives (at least Good status) that can solely be achieved |
|---|------------------|--------------------|--|--|--|--|
| 369 | 60 | 309 | Physical alteration | 342 | 369 | 60 |
| | | | Changes to water flow and/or water level | 114 | | |
| | | | Sediment | 46 | | |
| | | | Nutrients | 15 | | |
| *There may be multiple issues in a waterbody so numbers do not equal no of wbs impacted by land drainage/channelisation | | | | | | |

- Of the 369 wbs where measures for land drainage/channelization are required, 309 wbs (84 %) are multiple pressures. This means that, along with land drainage/channelization, there are other sectors that are impacting on water quality. For example, a waterbody may be impacted by land drainage/channelization, agriculture, forestry, and urban waste water. This means that all these must be involved in implementing measures before the environmental objectives can be achieved. However if, for example, only the measures addressing land drainage/channelization are implemented this will still result in a waterbody improvement in the 369 wbs but will not be sufficient to achieve the full extent of improvement required to reach its environmental objective in 309 wbs.
- Of the 369 wbs where land drainage/channelization measures are required, the water quality in 60 wbs (16 %) is impacted by only land drainage/channelization. This means that implementation of appropriate measure(s) to target these impacts should result in a waterbody improvement in all 369 wbs with 60 wbs achieving their WFD environmental objective.
- There are a number of issues impacting on water quality from activities relating to land drainage/channelization and these are impacts from:
 - Physical alterations to the habitat,
 - Changes in water level and flow,
 - Sediment, and
 - Nutrients.
- The issues identified with land drainage/channelization have been broken down in Table 4. The associated numbers indicate the scale of issues that measures need to target. For example, the highest proportion of impacts from land drainage/channelization are due to physical alterations and therefore the largest proportion of the measures will be required to

target these impacts. This will be closely followed by measures to target impacts from changes in water level and/or flow, sediment and nutrients.

- In waterbodies where land drainage/channelization is a pressure, there may be multiple issues impacting on the waterbody. For example in 60 wbs where land drainage/channelization is the only impact on water quality 36 wbs are impacted by one issue meaning one measure may be sufficient to address it. Whereas 24 wbs are impacted by two or more issues and this means that it is likely that a suite of measures will be required to target these multiple issues.
- If appropriate measures are implemented in all waterbodies where land drainage/channelization is impacting water quality there will be improvements in 369 wbs and of these 369 wbs, 60 wbs should achieve their environmental objectives.
- Further consideration is being given to what type and extent of specific hydromorphology measures might be required in each of the relevant waterbodies.
- When selecting a suitable suite of measures for land drainage and channelisation, consideration and, where appropriate, priority should be given to measures that can deliver water quality improvements and also benefits, for example, biodiversity, climate, flood alleviation and wellbeing.