Forests for water – protecting water, promoting sustainability

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Summary

- Publicly available EPA maps can assist farmers in identifying high-risk areas on their farm for potential nutrient loss and put suitable mitigation measures in place.
- Potentially every farm has an area that would be suitable for native tree planting.
- Under the proposed Forestry Programme 2023-2027, there will be a range of establishment options and tree species available to landowners.

Introduction

March 2023 saw the establishment of almost three hectares (ha) of new native woodland and undisturbed water setbacks at Teagasc's Animal & Grassland Research and Innovation Centre in Moorepark, Co. Cork. Teagasc's Forestry & Agricultural Sustainability Support and Advisory Programme (ASSAP) programmes have been encouraging the planting of such woodlands on farms, where appropriate. In the future, this exciting development will deliver a wide range of significant water-related ecosystem services, including:

- Reduction in sediment mobilisation and runoff into the adjacent river
- Interception of nutrient runoff into the watercourse
- River bank stabilisation
- Food input into the aquatic ecosystem
- Shading / cooling
- Regulation of floodwater
- Riparian restoration

These benefits are in addition to other ecosystem services such as increased native woodland biodiversity, habitat linkage within the wider landscape, carbon sequestration and increased amenity value.

Why plant trees in Moorepark?

The decision to plant native woodland in Teagasc Moorepark was based on the EPA's Pollution Impact Potential Phosphate Maps (PIP P maps) which identify areas that have a higher risk of Phosphate (P) loss. The farm at Moorepark is predominantly nitrate risky but the fields along by the Funshion River (i.e. the river floodplain) also have a high risk of phosphate loss. The 3 ha area planted in Moorepark accounts for approximately 33% of the P risky soil type within the farm. The P flow pathway identified within the area for planting, along with the P Index 4 soils, make the area an ideal location for native woodland planting. The water setback, an integral part of the woodland project, follows specifications set out in the *Environmental Requirements for Afforestation* (DAFM, 2016), and forms a strip of undisturbed ground vegetation positioned alongside the river bank.

New Forest Types (FTs)

Under the Department of Agriculture Food and Marine's (DAFM) proposed Forestry Programme 2023-2027, there will be a range of establishment options and tree species available to landowners, depending on site suitability and the landowners' objectives. Teagasc will be using the new woodland in Moorepark to highlight three options to farmers considering forestry, with a special focus on the protection of aquatic zones.

- **Forest Type 1 - Native Forests** - Creation of intimately mixed forest, comprised entirely of native species & prioritised native provenance (alder, oak, willow).
- **Forest Type 2 - Forests for Water** - Creation of native forest in targeted area, with the specific objective of protecting water from significant pressure.
- **Native Tree Area (NTA) 2** - Creation of native forest for water protection.

Moorepark Woodland - inputs & future management

Figure 1. *Woodland layout in Moorepark; Key: A - river; B - permanent undisturbed water setbacks; C - the new native woodland area; D - surrounding farmland*

The woodland was established with the minimal amount of site inputs (e.g. fertilisers) and disturbance (e.g. cultivation). The focus was on retaining natural site conditions and facilitating the emergence of a native woodland type that would occur naturally in time. Ground preparation was limited to inverted mounding and a small amount of pit planting. The control of competing vegetation such as grasses, herbaceous plants, bramble and bracken will be vital for the rapid establishment and growth of young trees on such a fertile location. While non-herbicide control (e.g. trampling, grass cutting, etc.) is only realistic on a small scale, any necessary post-planting spot spraying herbicide application will be kept to the minimum required to ensure success. Herbicide application will not be carried out within the water setback or within 20 metres of the aquatic zone.

Water Setback

The water setback was designed to create an intact and permanent buffer of natural vegetation alongside the aquatic zone, in order to protect water quality and aquatic ecosystems. In effect, the water setback breaks the 'pathway' between sources of possible pollution and the receiving watercourse. Appropriate tree planting within the water setback will deliver direct in-stream benefits such as bank stabilisation, cooling/shading, and food drop into the aquatic ecosystem.

Conclusion

Publicly available maps on www.catchments.ie are a very useful resource for all farmers to identify any high-risk areas on their farm for potential nutrient loss and put suitable mitigation measures in place. Potentially every farm has an area that would be suitable for native tree planting, particularly if it can be incorporated with a phosphate flow pathway to help break the pathway of overland flow. The aim is to slow the flow, allow the deposition of sediment and associated nutrients and also to encourage the uptake of nutrients by growing vegetation.