Cattle exclusion from watercourses:

Environmental and socio-economic implications

Teagasc, Crops, Environment and Land Use Programme, Johnstown Castle, Wexford.
DkIT, Centre for Freshwater and Environmental Studies, Dept of Applied Sciences, Dundalk Institute of Technology, Dundalk.
UCD, School of Biology ad Environmental Science, University College Dublin, Belfield, Dublin 4.
DCU, National Centre for Sensor Research, School of Chemical Sciences, Dublin City University, Glasnevin Dublin 9

1. Introduction

Loss of nutrients from grassland systems to waterbodies is a significant threat to water quality and represents one of the main environmental problems facing agri-ecosystems in Ireland. The EU Water Framework Directive (WFD) requires Member States to achieve or maintain at least 'good' ecological and chemical status in all waters by 2015. Measures proposed under the Green Low carbon Agri-environment Scheme (GLAS) include preventing bovine access to watercourses to improve water quality. Studies suggest that unrestricted cattle access to watercourses can result in deteriorating water quality, however conflicting studies indicate that cattle do not have a significant effect on stream water quality.

2. Aims and Objectives

The aim of this project is to assess the environmental, ecological and socio-economic impact of existing and potential measures that prevent cattle access to watercourses.

Objectives

- Assess the impact of cattle access and cattle in-stream activity on freshwater geochemical and ecological parameters
- Determine the impact of cattle access on hyporheic water chemistry and invertebrate fauna
- Determine the extent of ecosystem impact and recovery at a spatial-scale downstream of cattle access points.
- Evaluate impact of proposed cattle exclusion measures (under GLAS) on freshwater geochemical, biological and ecological (in-stream and hyporheic) parameters.
- Evaluate the cost-effectiveness of fencing (and critically assess natural alternatives to fencing) as measures to improve the hydro-morphological condition of watercourses.
- Evaluate the cost-effectiveness of existing and novel water provision mechanisms.
- Determine the proportion of farms that have flowing or still water on or adjacent to their land parcel, thus potentially impacted by cattle exclusion measures.
- Assess 'willingness to adopt' cattle exclusion measures and determine level of

Figure 5: Geochemical data collection

Figure 6: Ecological data collection

3.Cattle access to watercourses

Figure 1: Unfenced cattle access point

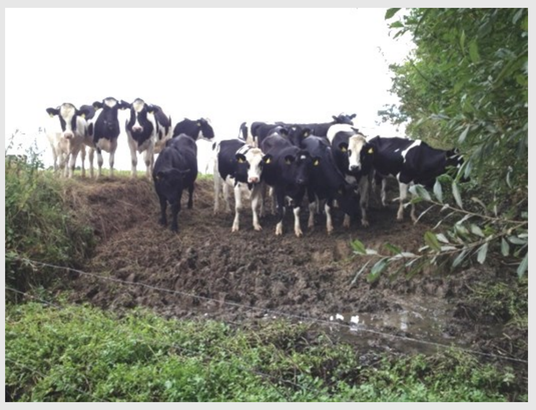

Figure 2: Fenced cattle access point

Figure 3: Unfenced river-bank

Figure 4: Fenced river bank

4. Expected benefits

This study will identify the impact certain agricultural stressors have on stream biotic and abiotic parameters. This knowledge will facilitate policy-makers to identify the most cost-effective cattle exclusion measures to help surface waters achieve WFD targets.

Information from the study will justify the prioritisation and targeting of cattle exclusion measures in future revisions of the Rural Development Programme.

Understanding of farmer attitudes to the environment, their perception of estimated costs associated with cattle exclusion measures and their likelihood of adopting specific existing and potential measures to prevent cattle access or novel water provision mechanisms, will aid the revision of existing mitigation measures and the development of new potential cost-effective measures. Cattle exclusion measures (and associated water provision mechanisms) will thus be appropriately designed and costed for Irish conditions, taking into account differing farming enterprises and intensities.

The study will contribute to environmental policy and to improved management of agricultural and surface water landscapes in Ireland.

5. Acknowledgements

This project is funded by the Environmental Protection Agency.

6. Further Information

Daire Ó hUallacháin; daire.ohuallachain@teagasc.ie