

# COSAINT - Cattle Exclusion from Watercourses: Environmental and socio-economic implications

P. O'Callaghan<sup>1</sup>, K. Daly<sup>1</sup>, O. Fenton<sup>1</sup>, S. Green<sup>1</sup>, E. Jennings<sup>2</sup>, M. Kelly-Quinn<sup>3</sup>, S. Linnane<sup>2</sup>, F. Regan<sup>4</sup>, M. Ryan<sup>1</sup>, M. Shore<sup>1</sup>, G. Shortle<sup>1</sup> and D. Ó hUallacháin<sup>1</sup>

<sup>1</sup>Teagasc, Johnstown Castle, Wexford, Co. Wexford, Ireland

<sup>2</sup>National Centre for Freshwater Studies, Dept. of Applied Sciences, Dundalk Institute of Technology

<sup>3</sup>School of Biology and Environmental Science, Science Centre West, University College Dublin

<sup>4</sup>School of Chemical Sciences, Dublin City University

paul.ocallaghan@teagasc.ie



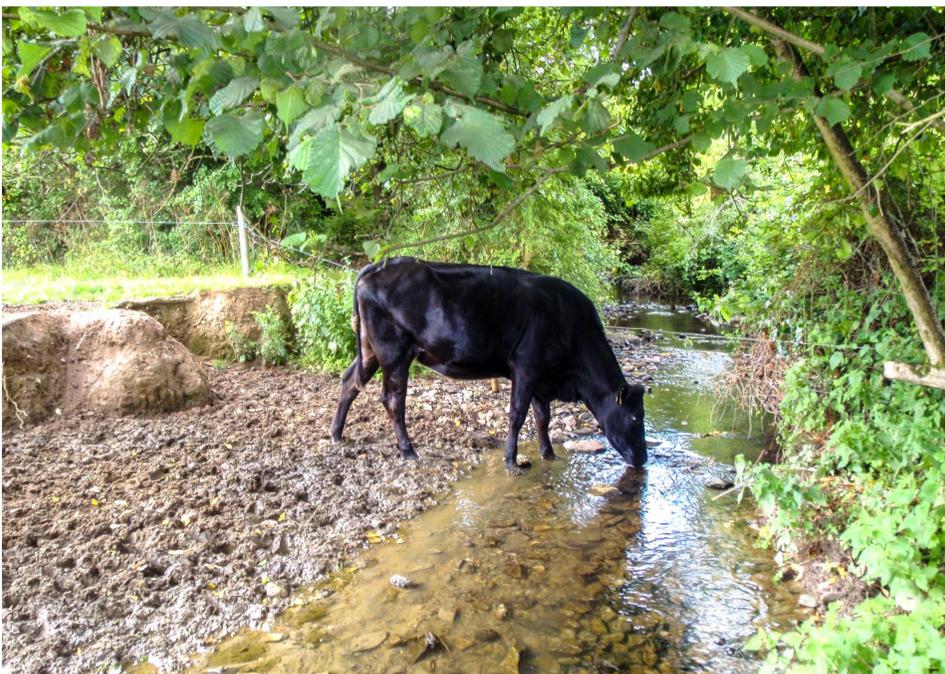
## INTRODUCTION

The Food Harvest 2020 report aims to significantly expand the Irish agri-food sector. This intensification could potentially put significant pressure on waterbodies draining agricultural systems. Agri-Environment Schemes such as REPS and GLAS have often been employed to address the challenge of sustainable agricultural expansion and both of these include provisions aimed at limiting bovine access to waterways.

Studies suggest that unrestricted cattle access to watercourses can have detrimental impacts on water quality. However there is a lack of local research with the few existing Irish studies showing divergent results.

The present project aims to address this by examining the geochemical, physicochemical and ecological effects of cattle access to (and exclusion from) streams.

Additionally, the study will assess the socioeconomic implications of cattle exclusion measures including farmer's attitudes and willingness to adopt mitigation measures.



## METHODS

Field sites will be selected based on the available literature and expert opinion. These sites will be studied to assess the effects of cattle access points, cattle in-stream activity and proposed cattle exclusion measures on their respective environmental parameters:

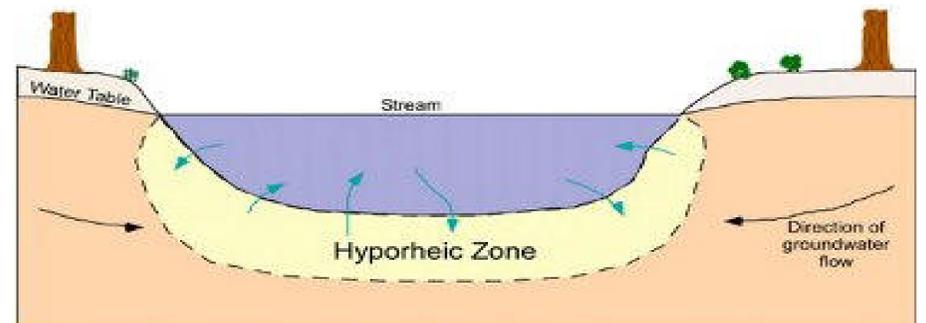
- Dundalk Institute of Technology will examine geochemical, physical and bacteriological parameters
- University College Dublin will investigate ecological parameters

### DKIT-Geochemical and Bacteriological

- 1) examine the role of stream sediments at access points as sources of water-borne pollutants
- 2) model the estimated nutrient loading from cattle access in the context of the total catchment load
- 3) inform the management of nutrient and microbial contaminants originating from cattle access

## UCD-Ecological

- 1) Examine the impact on freshwater benthic ecology and its temporal and spatial recovery
- 2) Examine the effects on the hyporheic zone (the zone under and adjacent to the stream bed influenced by both stream and ground water)



## Socio-economic

- Evaluate the cost-effectiveness of fencing and alternative water provision mechanisms in improving water quality
- Assess farmer's attitudes to the environment, their perception of estimated costs and likelihood to adopt existing and novel mitigation measures



## DISCUSSION

This Project will

- Identify the impact of agricultural stressors resulting from cattle access points on biotic and abiotic parameters
- Evaluate the cost-effectiveness of proposed mitigation measures
- Evaluate likelihood of farmer's adopting potential mitigation measures and the levels of incentives required to ensure adequate participation

## IMPACT

Project results will

- Facilitate policy-makers to help surface waters achieve Water Framework Directive Targets
- Help Justify the prioritisation and targeting of cattle exclusion measures in future revisions of the Rural Development Programme
- Allow the appropriate design of cattle exclusion and mitigation measures for Irish conditions
- Contribute to the sustainable objectives of Food Harvest 2020

## ACKNOWLEDGMENTS

Funding for this project is provided by EPA Research.