Ranking connectivity risk for phosphorus loss along agricultural drainage ditches

T. Moloney, O. Fenton and K. Daly
Teagasc, Environmental Research Centre, Johnstown Castle, Co. Wexford

Introduction

- Agricultural drainage systems comprising in-field pipe drains and surface ditches are typically installed to remove excess water from the land
- These systems can provide connectivity between P sources and surface waters thereby increasing the risk of P loss to rivers and streams

Objective

- Derive a farm-scale ranking system that categorises drainage ditches in terms of P loss-risk based on connectivity and physic-chemical characteristics

Materials and Methods

- 10 pilot farms representing a range of agronomic and biophysical settings were selected across Ireland
- Locate and digitise drainage ditch network
- Ditch grab samples;
    - sediment (WSP, Mehlich3-P, EPCo)
    - water (dissolved, reactive and particulate P fractions)

Results

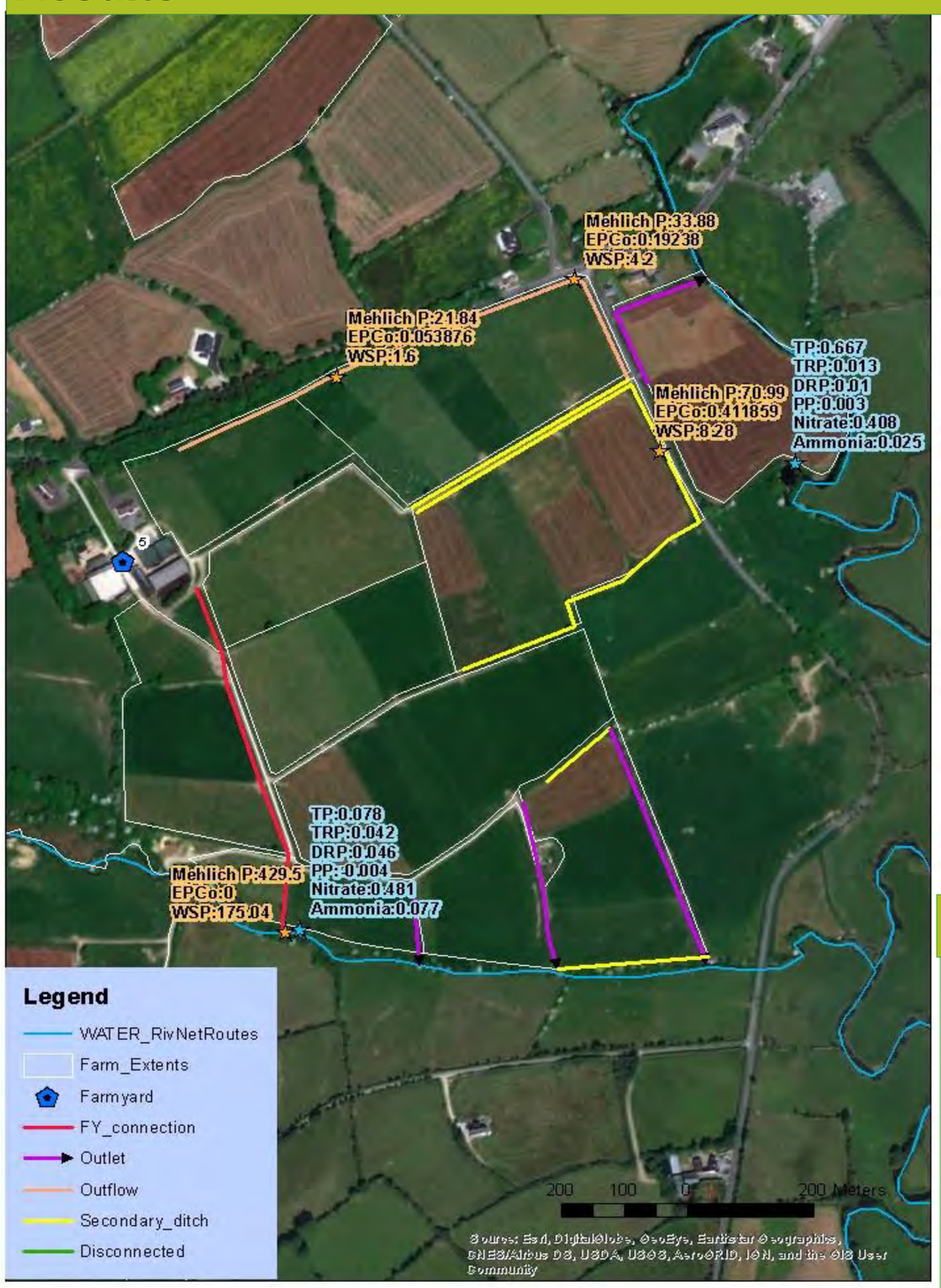

Table 2: Definition and description of ditch categories.

Ditch category	Description
1. FY connection	A ditch/pipe that connects a farmyard to the drainage network or directly to a surface water body.
2. Outlet	A ditch that connects the drainage network to a surface water body.
3. Outflow	A ditch that carries drainage water across the farm boundary through neighbouring land.
4. Secondary	A ditch that typically flows perpendicular to the slope of the land connecting two larger ditches. Can also occur as an open ditch running through a field in order to collect and remove large excesses of surface water.
5. Disconnected	A ditch that is not connected to the overall ditch network.

Conclusions

- Varying levels of connectivity exist between surface drainage ditches and surface waters
- Landscape position and sediment P chemistry describe the risk of P loss in 5 ditch categories
- Highest risk attributed to ditches connecting farm yards and outlets to waterways
- Legacy P accumulated in ditch sediment from farmyards and at outlets over time

@WaterMarke

@tom_moloney58

@ofenton

@KarenDaly053

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