

# Erosion Control in Lunan Catchment



Enhancing Water Quality

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## Factors Contributing to Soil Erosion

- Land form has slopes often  $>5^{\circ}$
- Top and/or sub-soils predominantly derived from Old Red Sandstone
- Regular deep (ie. plough) cultivations on most farms, autumn and spring depending on crops
- Increasing autumn rainfall intensities
- Combination of these factors  $\rightarrow$  soil erosion by surface water, and associated loss of adhered contaminants to field drains, ditches, streams and lochs



Sediment loss is not only the result of surface flow erosion, drain flow contribution can be significant but less visible.



# Classification of Erosion Risk

Derived from MLURI work in 1990's

Geomorphological risks depend on soil texture, land form

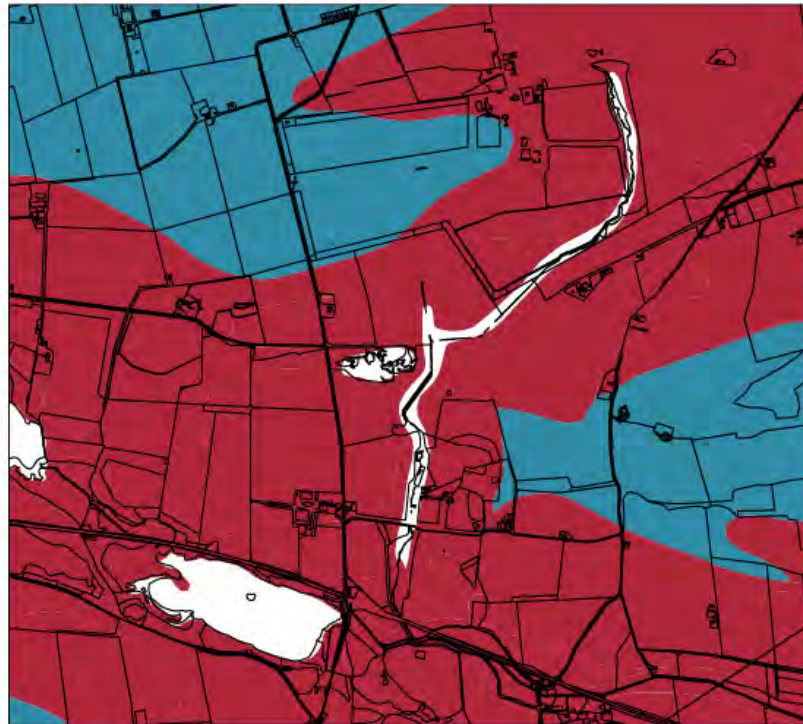
Presence of ORS in soil increases erosivity (A Frost)

P preferentially adheres to fines → high P concentration on fines, wide dispersion (Ball & Dickson)

Flow path risk is based on field drainage status and proximity to receiving water

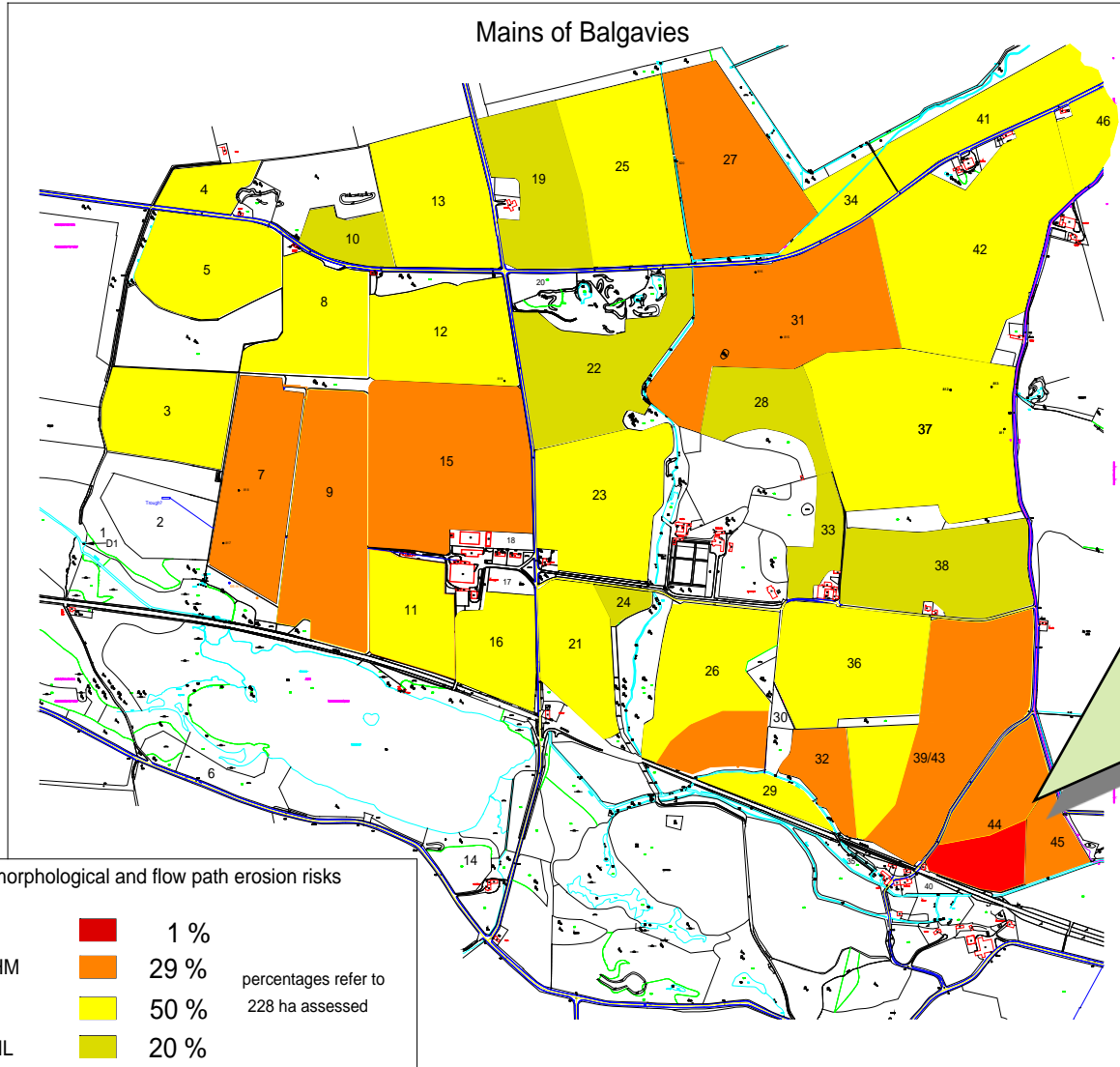
## Mains of Balgavies topsoil texture

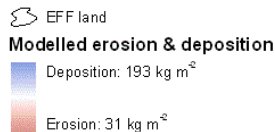
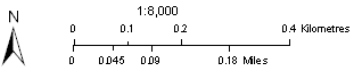
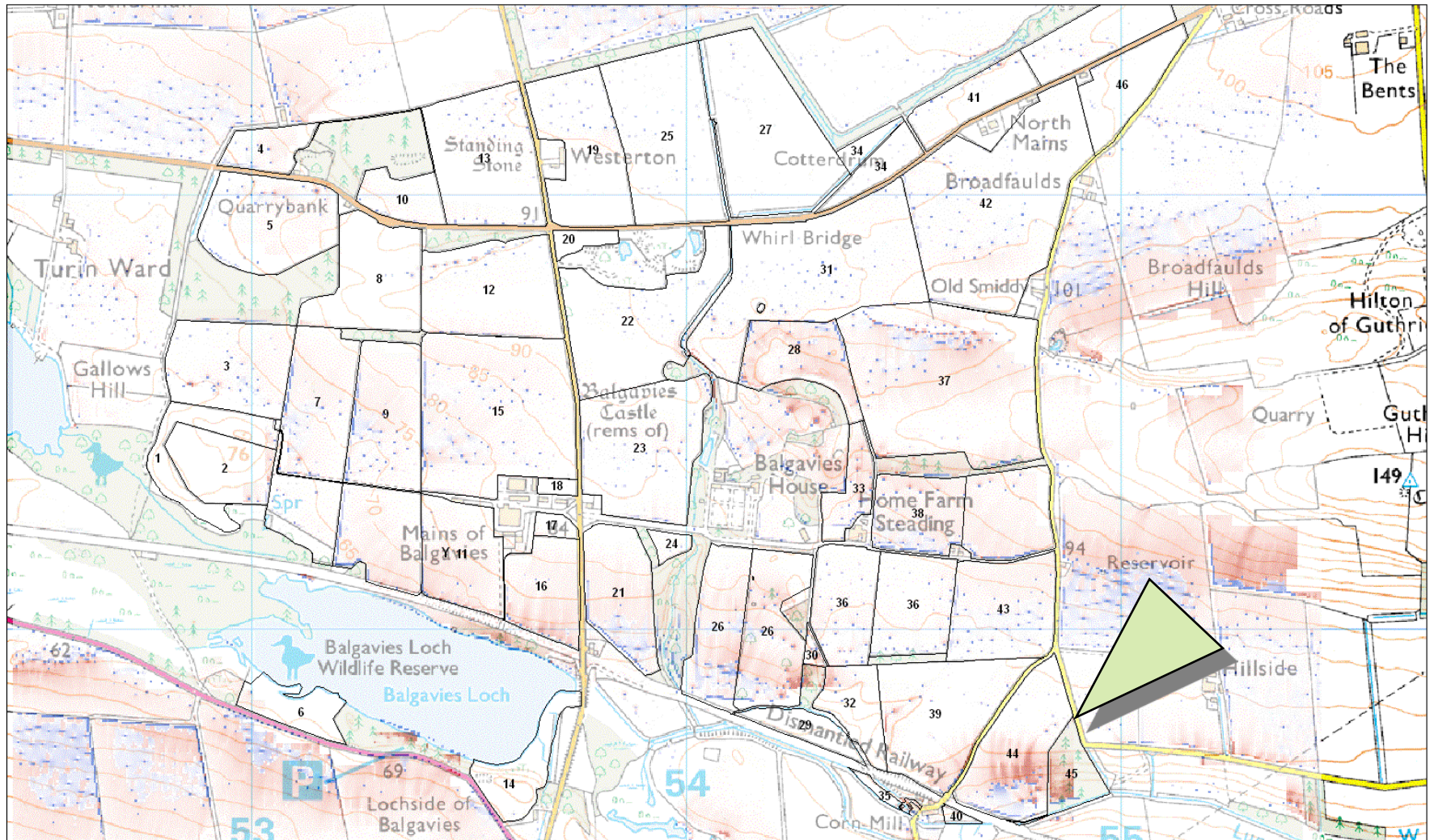
- CL
- SL





# Erosion Risk Map





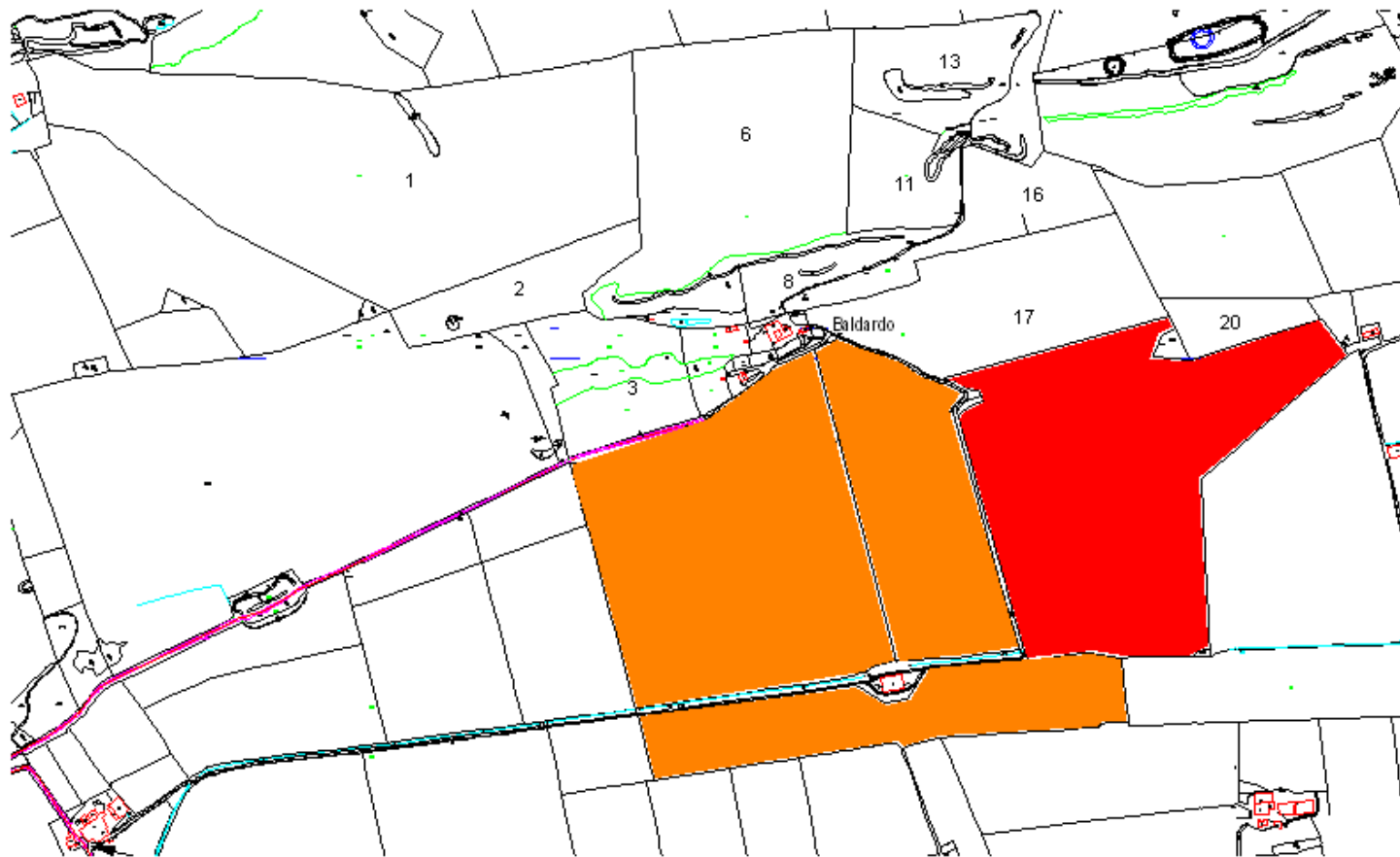
### Modelled water driven soil erosion & deposition across the Environmental Focus Farm.

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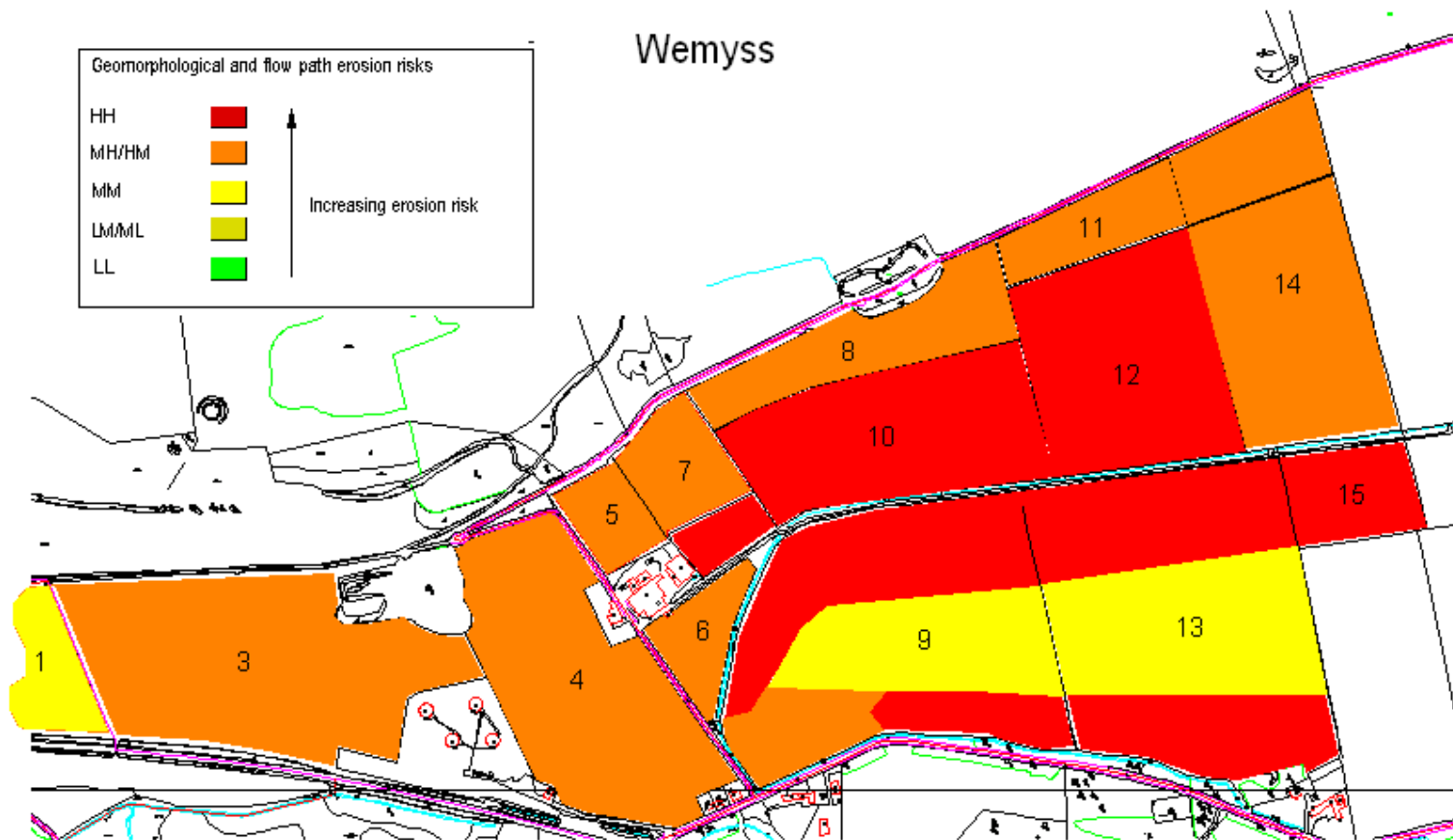




# Baldardo







## Farm management measures

- Optimise inputs, particularly N, P
- Estimates of field by field erosion risk
- Careful choice of fields for higher risk crops (potatoes, winter wheat)
- Increase soil organic matter – introduce grass leys, add FYM or bulky organic fertiliser, chop straw
- Avoid bare ground in autumn – under sow green manures
- Avoid late sown autumn crops?
- Reduce cultivations to build a surface layer of organic matter, reduce compaction







## **Greenhead sediment pond**

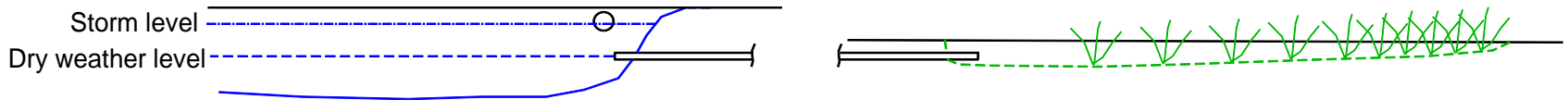
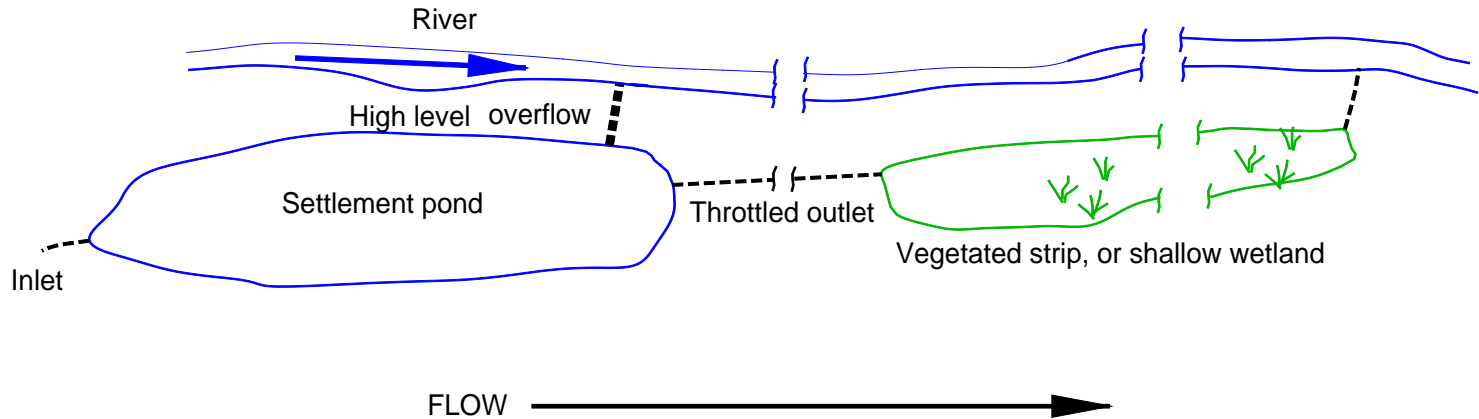
Construction (2003?) c £2000

Excavation needed every 3-4 years, each yields

c. 200 tonnes soil returned to fields

Sediment analyses indicate around 300 ppm P, 1200 ppm K



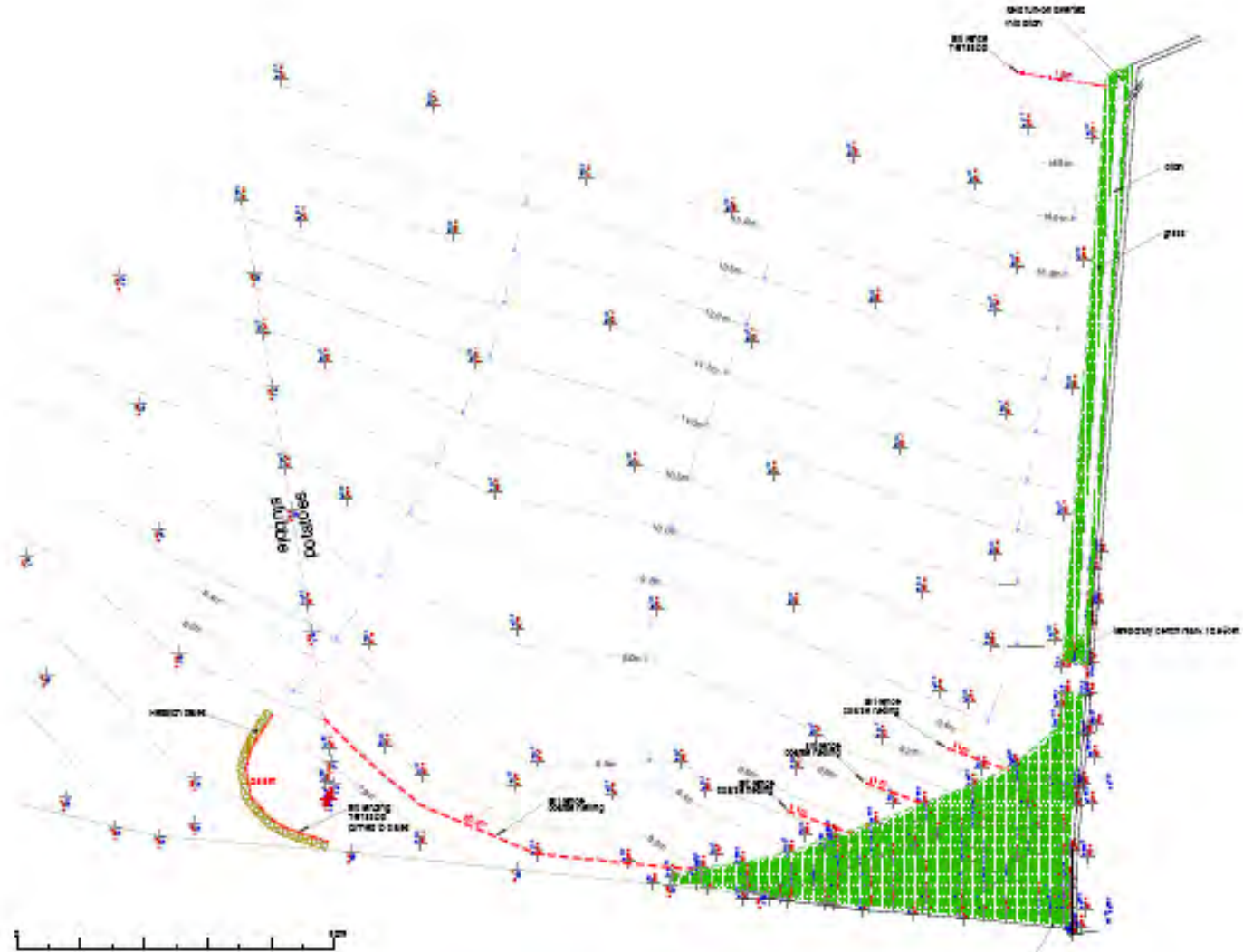


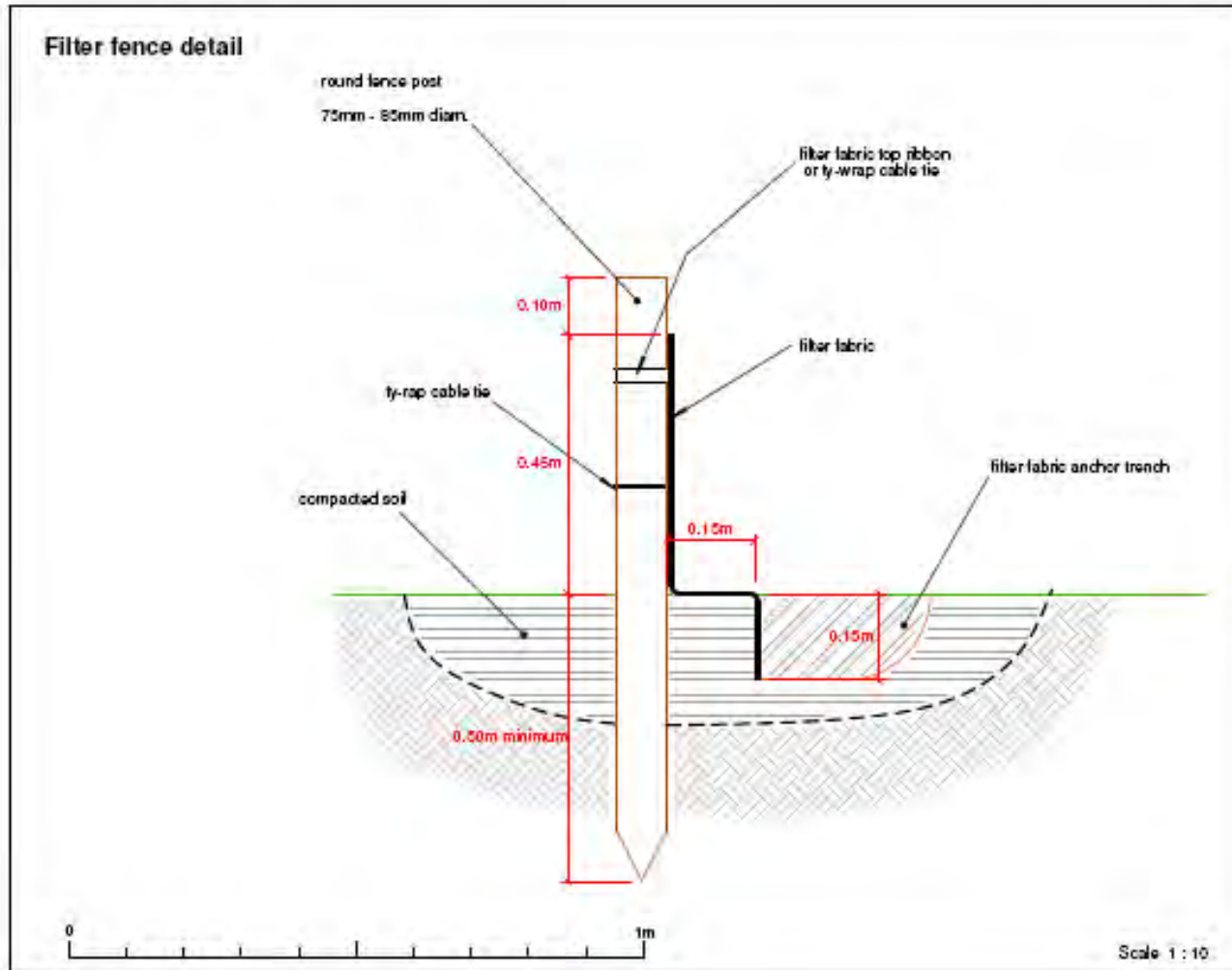
Concept of planned installation at Mains of Balgavies, to intercept a main field drain

# Erosion after Potatoes













Temporary installation, can be moved to other fields. Cost in Oct 2010 equivalent to £30/kg P retained, similar to buffer strips.