![Catchment Sensitive Farming — Working together for a healthy environment]
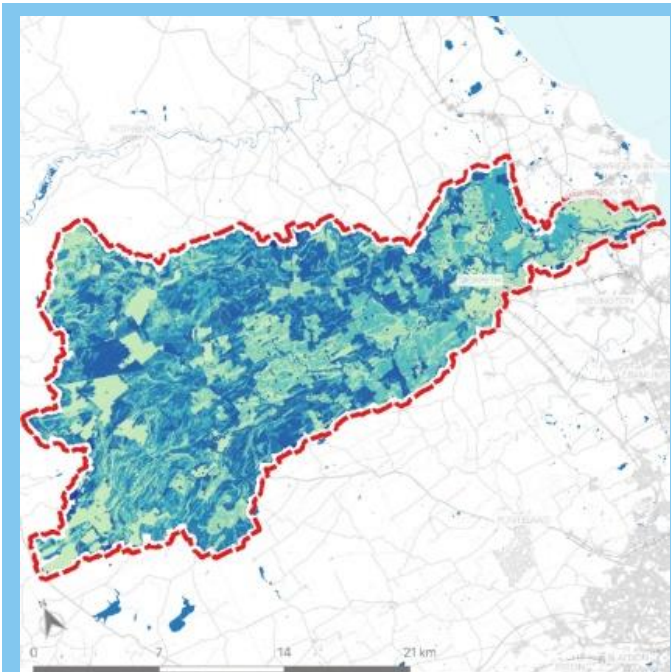
Using data modelling to identify sustainable catchment solutions

**Catchment Sensitive Farming (CSF) has been working together with farmers since 2006.**

This study in 2020 used high-tech modelling to maximise the benefits delivered by nature-based interventions across the Wansbeck catchment.

How the landscape is currently acting to stop flooding across Wansbeck: dark blue areas are working hard; pale colours are doing little

Viridian Logic used their HydroloGIS model to understand landscape function across Wansbeck, which is to the west of Morpeth, Northumberland. The community have often been affected by flooding and local farmers wanted to help do something about it.

The model used a variety of local and national data, ranking every part of the landscape for how well it was working to prevent flooding, nitrate and phosphate pollution and soil loss.
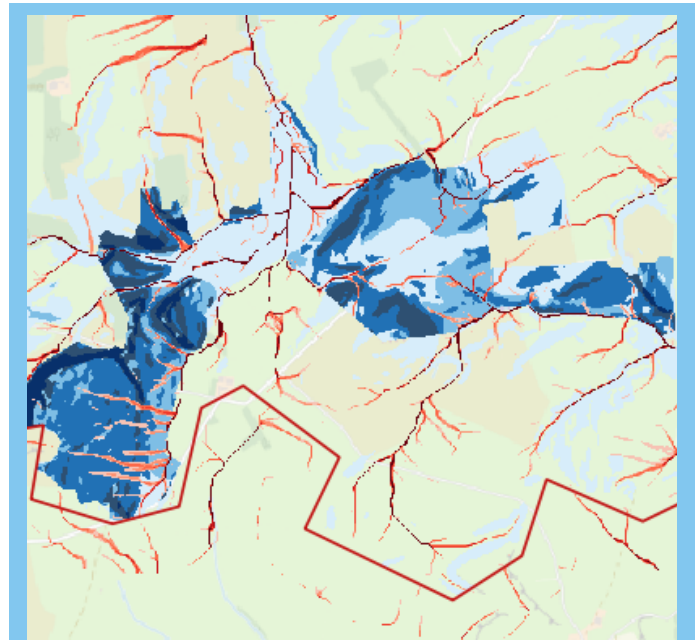
Where to create bunds on grassland to temporarily store water during storms. Dark blue areas are most effective, light blue less so. Bunds should be built across the water flow paths, shown as red lines

What to do where, to get best 'bang for buck'

They then showed the best changes to make; to further reduce these problems. These included:

- leaky dams in streams
- storage ponds
- field-margin features such as swales and hedges
- Mid-field measures on pasture, such as leaky bunds
- Tree planting

The final maps showed a variety of ranked Nature-Based Solutions (NBS). This helped farmers blend these possible solutions with their grounded knowledge and plans for their land. This will make sure the most effective and pragmatic actions are implemented.

Rainfall ponding and irrigation water

The modelling process also identified depressions in the landscape that would be likely to 'pond' during heavy rains.

Where these 'ponds' coincide with high flows of water across the land; there are opportunities to capture water for irrigation. Creating catchment ponds or small reservoirs would take minimal engineering.


Creating new natural habitat in blue areas will help animals move between existing patches of habitat, shown in pink. Areas in green and blue show where these new natural habitats coincide with other important habitats

Where these opportunities also coincide with high-priority locations for reducing flooding, then capturing this water can offer multiple benefits.

Giving nature room to move

Habitat connectivity modelling was also undertaken. This helps identify where new natural habitats could fill gaps in the landscape and help increase the range of species.
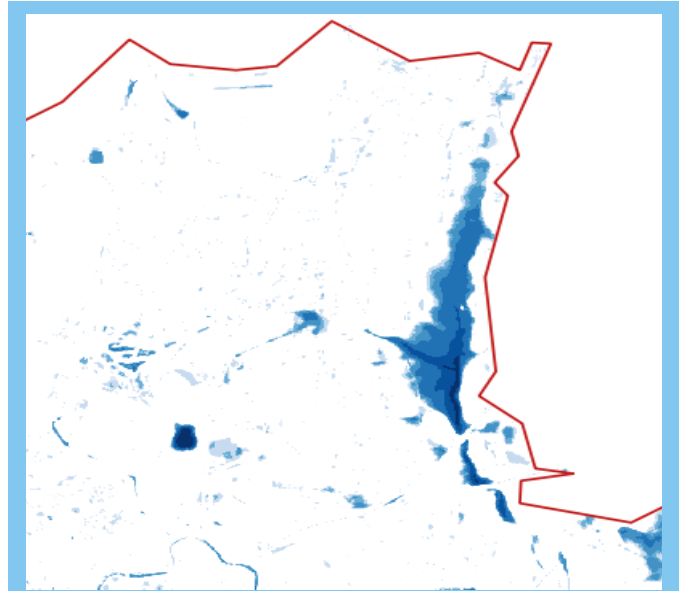
Natural ponding areas: the darker the blue, the deeper the ponding can become

Overlaying these new natural habitats with flood, pollutions and soil loss priorities will show where single actions could have multiple benefits for the land, people and nature.

Please get in touch with Lydia Nixon Lydia.nixon@naturalengland.org.uk for further information and advice.

Get in touch with your local Catchment Sensitive Farming Officer at gov.uk/catchment-sensitive-farming