

Planning for climate change adaptation: North Doddington Farm

This is one of a series of notes showing how land management can contribute to climate change mitigation and adaptation. TIN107 *Environmental Stewardship and climate change mitigation* explains how Environmental Stewardship (ES) options can be used to reduce the scale of climate change. This note and TIN109 provide case studies highlighting different aspects of land management to address both mitigation and adaptation. This series has been written for advisers and farmers working on ES and other environmental land management initiatives.

Key points

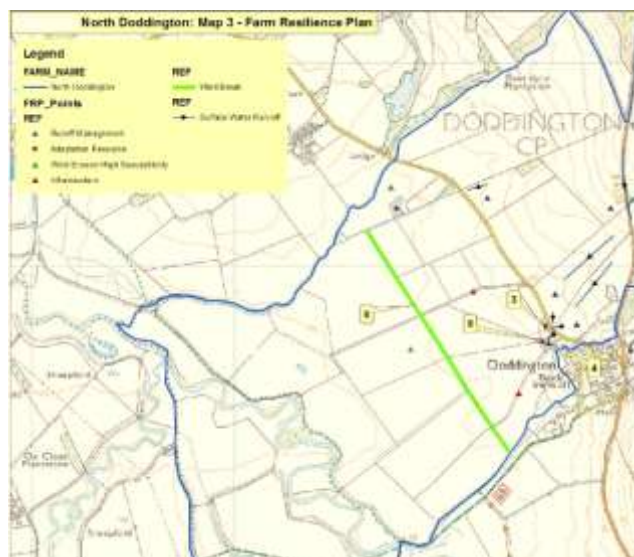
The Maxwell's of North Doddington Farm, with the help of the Cheviot Futures project, prepared a Farm Resilience Plan to identify how climate change planning could be integrated into their farm business planning.

Their existing Higher Level Stewardship (HLS) agreement was already helping the natural environment adapt to climate change by using arable reversion options to link the previously isolated grasslands.

As a result of the resilience plan the HLS agreement was amended to include additional actions to help protect both the natural environment and the farm business, for example, new tree planting to provide a windbreak to protect against the increasing risk of soil erosion.

Site details

North Doddington Farm covers 425 hectares of low lying land near Wooler in Northumberland. Enterprises include 750 dairy cattle, 400 lowland sheep and 260 hectares of arable crops (fodder beet, potatoes, spring barley, winter wheat and temporary grass).



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The River Till runs through the farm with adjacent fields being susceptible to flooding. The river and surrounding land is designated a Site of Special Scientific Interest (SSSI) and a Special Area of Conservation (SAC).

There is a variety of soil types across the farm, with heavier soils towards the river and lighter soils away from the floodplain.

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What they have done

In summer of 2011 the Maxwell's took part in an innovative project run by Cheviot Futures, to conduct a Farm Resilience Plan. The Plan involved:

- Identifying the climate projections for the local area.
- Assessing the likely opportunities and challenges presented by climate change to the farm practices and natural environment at North Doddington Farm.
- Recommending actions to address those challenges and opportunities.

Particular risks and opportunities identified at North Doddington included:

- Unavoidable flood risk along the river.
- Managing surface water flow to minimise the flood risk to the dairy unit.
- Susceptibility to wind erosion across open fields on the lighter soils.
- Water demand for the dairy and irrigation during drier periods.
- Potential risk of heat stress in livestock.



Wind erosion on light soil

As a result of this risk assessment a range of potential actions were identified to improve the resilience of North Doddington Farm to climate change. These include:

- **Soil management:** implement regular soil testing and extend the use of best practice measures, to enable the selection of appropriate crops and cultivars and to target nutrient applications.

- **Undertake a water audit:** to encourage improved efficiency of water usage across the farm.
- **Introduce additional biosecurity measures:** to maintain livestock health and well-being.
- **Flood management:** Prepare a Farm Flood Plan to avoid flooding risk to arable areas and ensure safe exit routes for livestock in times of flood.

Two actions are being implemented through Higher Level Stewardship:

- 100 ha of arable reversion on flood prone land in the south-west corner of the holding. This will remove the threat of flooding from their arable crops whilst creating a large, more resilient habitat along the length of the SSSI river.
- Planting 800 m of new shelter belt (shown in green on the farm map). Primarily intended to act as a windbreak, this will reduce the risk of soil erosion. It will also provide some shelter for livestock, which will reduce the risk of heat stress in hotter spells.

Further actions are being considered with the Catchment Sensitive Farming project including:

- **Improve slurry storage:** to reduce water content and hence increase storage capacity.
- **Develop a set of sustainable drainage measures:** to manage flow during periods of intense rainfall.

The advantages of this Resilience Planning approach are:

- It enables an assessment of the full range of potential climate change impacts on the farm business.
- Planning ahead makes it easier to include management of the natural environment in adaptation strategies (ie the shelter belt should have time to develop before climatic changes make the risk of wind erosion significantly worse).
- It identifies potential funding opportunities and sources of advice for the actions proposed.

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How will this help address climate change?

Adapting to climate change

Forward planning has enabled the Maxwell's to increase the resilience of their farm business to climate change and to include the management of the natural environment in their planning.

Establishing networks that link habitats, and allow species to travel across the wider countryside, will help wildlife adapt to climate change and increases the resilience of the natural environment. These are known as ecological networks and the Maxwell's are contributing to their development by:

- linking the existing patches of grassland along the river SSSIs; and
- establishing new hedgerows and shelter belts.



New hedgerow

Mitigating climate change

The focus of the work at North Doddington is on adapting to climate change. However, the work will also help to reduce the scale of climate change because the grassland creation and tree planting will increase the amount of carbon storage in the soil and vegetation on the farm.

Research estimates that this is equivalent to 3.5 t CO₂e each year per hectare of new grassland and 2.2 t CO₂e per hectare for creation of a shelter belt.

Entry Level Stewardship (ELS) options on the farm include under-sowing spring cereals with rye grass. This is one of the best ELS options for climate change mitigation because it helps farmers to reduce their greenhouse gas emissions without restricting production.

Other benefits

The new grassland and the under-sown rye grass swards are also benefiting the natural environment by providing food for wintering populations of geese that traditionally centre round Lindisfarne National Nature Reserve. In the winter of 2011/2012 populations of 2-3,000 pinks and some greys were seen on the new grass options.

Cheviot Futures

This project works in both North Northumberland and the Scottish Borders to:

- Raise awareness of the predicted threats and opportunities of climate change in the Cheviot Hills and the wider Tweed catchment.
- Take simple practical approaches to land management that focus on adapting to the effects of climate change.
- Share best practice to support, and where appropriate, diversify rural businesses.
- Work with farmers and land managers to develop and trial new sustainable solutions to the impacts of climate change which deliver wider community and economic resilience.
- Support local businesses by helping them to become more resilient to the predicted climate changes.

Further information

Natural England Technical Information Notes are available to download from the Natural England website: www.naturalengland.org.uk. In particular see:

- TIN093: *Shelter woods to prevent wind erosion*

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- TIN098: *Protecting water from agricultural run-off: an introduction*
- TIN099: *Protecting water from agricultural run-off: water retention measures*
- TIN100: *Protecting water from agricultural run-off: buffer strips*
- TIN101: *Solar parks: maximising environmental benefits*
- TIN107: *Environmental Stewardship and climate change mitigation*
- TIN109: *Arable reversion and climate change: Humberhead Levels case study*

For further information contact the Natural England Enquiry Service on 0300 060 0863 or e-mail enquiries@naturalengland.org.uk.

Where to find out more

To find out more about Farm Resilience Plans and the Cheviot Futures project contact: Tracy Hall, Tweed Forum tracy.hall@tweedforum.com. Tel: 01668 282 121 www.cheviotfutures.co.uk

To see how you can manage land to adapt to climate change contact Trevor Mansfield, Natural England.

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