

## The role of woodland in Catchment Sensitive Farming



The England Catchment Sensitive Farming Delivery Initiative is a new programme that aims to improve water quality by advising farmers on how to reduce the amount of soil, nutrients and pesticides entering watercourses

[\[http://www.defra.gov.uk/farm/environment/water/csf/index.htm\]](http://www.defra.gov.uk/farm/environment/water/csf/index.htm)

Defra has identified 40 priority river catchments where there is a high risk of diffuse water pollution from agriculture. Each has a Catchment Sensitive Farming Officer. There are nine priority catchments in the East of England.

Trees and woodland can reduce water pollution by protecting

soils, trapping sediment and removing nutrients and pesticides. They can also stabilise riverbanks and help to ameliorate downstream flooding.

The Forestry Commission and Catchment Sensitive Farming Officers in the East of England are working together to establish how trees and woodlands can contribute to reducing diffuse water pollution. Important opportunities were identified to contribute to the Water Framework Directive and to improve the condition of Sites of Special Scientific Interest.

### Background

- Agriculture presents the single biggest threat of diffuse water pollution in England in the form of nitrate, phosphorus, faecal bacteria and sediment delivery. In addition to reducing the ecological status of many river systems, agricultural run-off can have significant social and economic costs through polluting drinking and bathing waters, degrading fisheries and potentially increasing flood risk.
- A number of international and domestic objectives have been agreed, relating to conservation and water quality that require action to tackle diffuse water pollution from agriculture (DWPA). Of these, the Water Framework Directive (WFD) [[www.defra.gov.uk/environment/water/wfd/index.htm](http://www.defra.gov.uk/environment/water/wfd/index.htm)] and the PSA target of 95% of Sites of Special Scientific Interest (SSSIs) [[www.english-nature.org.uk/special/ssi/index.cfm](http://www.english-nature.org.uk/special/ssi/index.cfm)] being in "target" condition by 2010, are key.
- The Catchment Sensitive Farming Programme is aimed at reducing DWPA in England to meet WFD requirements through developing and implementing a programme of best practice measures. The measures have added value by contributing to several of Defra's wider objectives, including encouraging sustainable farming, improving wildlife habitats and reducing flood risk.

### The England Catchment Sensitive Farming Delivery Initiative

- The England Catchment Sensitive Farming Delivery Initiative (ECSFDI) was rolled out in April 2006 in forty priority catchments in England (**Figure 1**), at a cost of approximately £21.8 million over two years.

- The ECSFDI is seeking to demonstrate how best management practice can reduce diffuse water pollution from agriculture. This is land management that keeps diffuse emissions of pollutants to levels that are consistent with the ecological sensitivity of aquatic habitats and needs of users of river and groundwaters, both in the immediate catchment and further downstream.
- In terms of farmer behaviour and practice, Catchment Sensitive Farming includes encouraging best practice in the use of fertilisers, manures and pesticides; promoting good soil structure to maximise infiltration of rainfall and minimise run-off and erosion (e.g. by reducing stocking density or grazing intensity); protecting watercourses from contamination by faecal bacteria (e.g. by restricting livestock access to watercourses with fencing), sediment and pesticides (e.g. with buffer strips); changing crop types, woodland planting, etc.
- The ECSFDI is a partnership between Defra, Natural England and the Environment Agency.

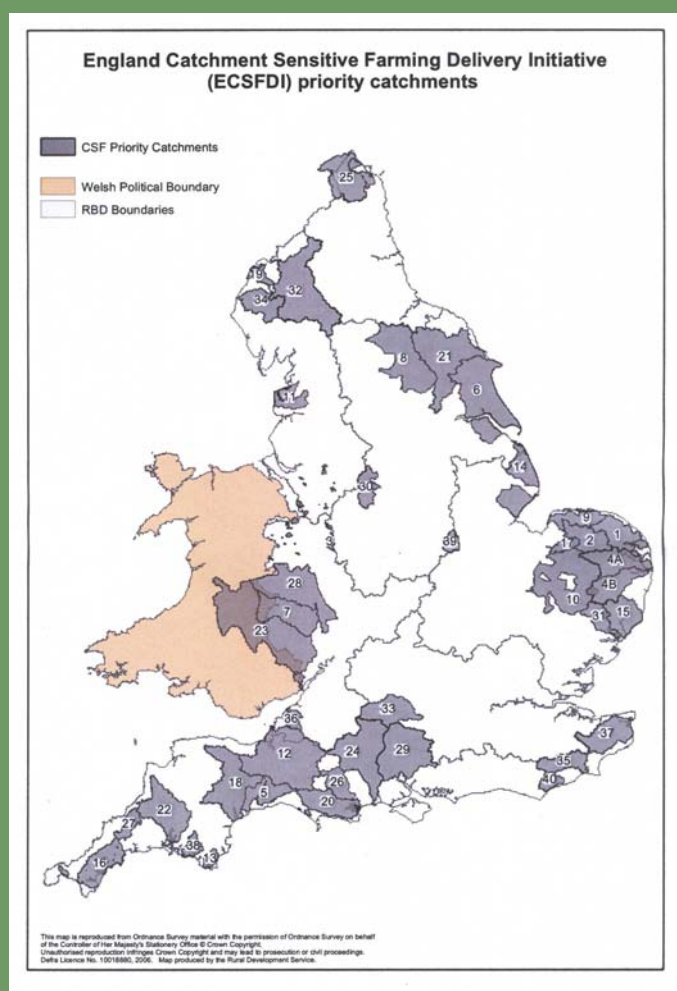
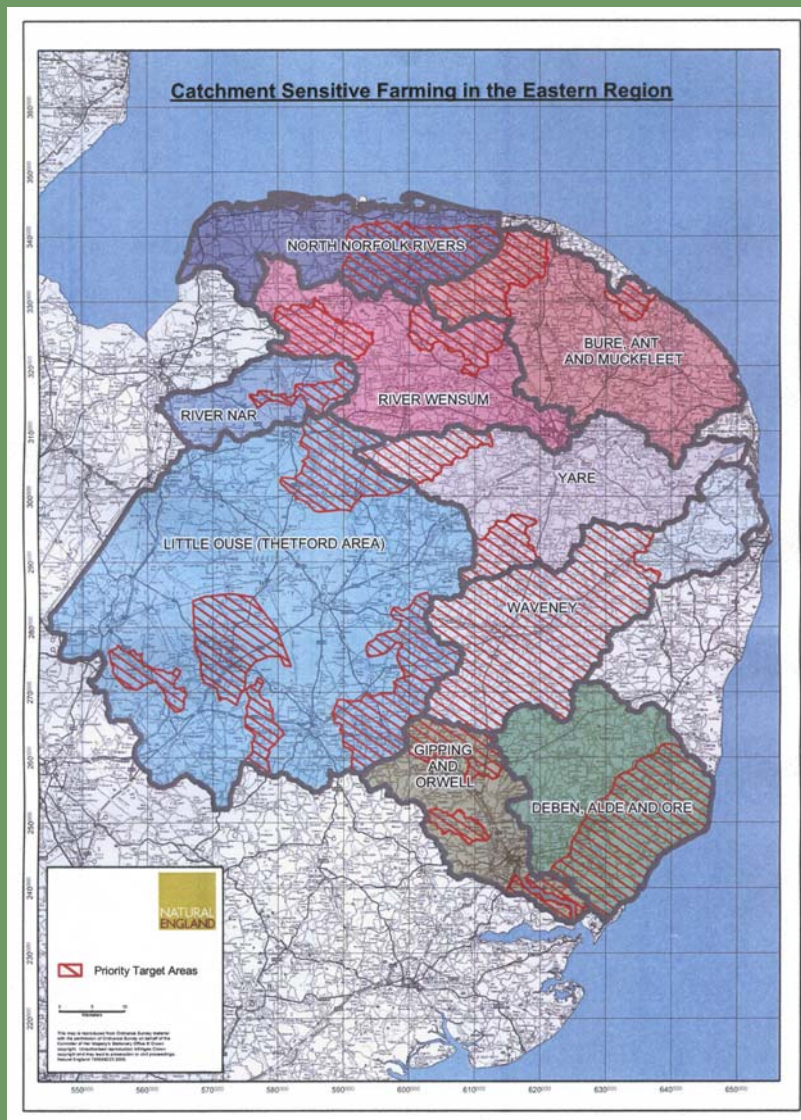


Figure 1 - Priority catchments in England

## Catchment Sensitive Farming in the East of England

- There are nine Catchment Sensitive Farming Officers in the East of England, each covering one of the priority catchments. The nine catchments cover much of Norfolk and Suffolk, and part of Cambridgeshire (*Figure 2*).
- Officers have carried out a catchment appraisal in each of the nine catchments to find two things: the highest impact source of diffuse pollution; and hotspots where its impact is greatest. The highest priority issue in all the East of England catchments has been found to be sedimentation. The pollution source drives the advice given to farmers and landowners. The hotspots are shown as a red hatch on *Figure 2*.
- Officers guide landowners in completing cross-compliance Soil Protection Reviews, and Entry Level Scheme Soil Management Plans. The advice is free and farm-specific. Farmers are not compelled to take the advice (although there may be cross-compliance issues), but the prospect of further legislation in this area if voluntary improvements are not made is an incentive.
- The ECSFDI is backed by a capital grant scheme, with an initial budget of £5m for England. Maximum individual grants of £10k are available within priority catchments, based on standard rates. A number of measures can be grant aided, including small scale tree planting, fencing and coppicing. However, in the East of England priority is likely to be given to improving infrastructure such as the repositioning of field gates and access points to reduce the risk of polluted run-off reaching watercourses.
- Within individual priority catchments, officers assess each sub-catchment for risk of diffuse water pollution, based largely on factors of slope and lightness of soil (the steeper the slope and lighter the soil, generally the higher the risk). A risk-map will be produced highlighting priority subcatchments for action (*Figure 3*).
- When preparing soil management plans, landowners refine the assessment of diffuse water pollution even further by categorising each field as “very high”, “high”, “moderate” and “lower” risk, as well as identifying any “flood” risk. *Figure 4* is an example of this farm level assessment.



*Figure 2 – Priority catchments in the East of England*

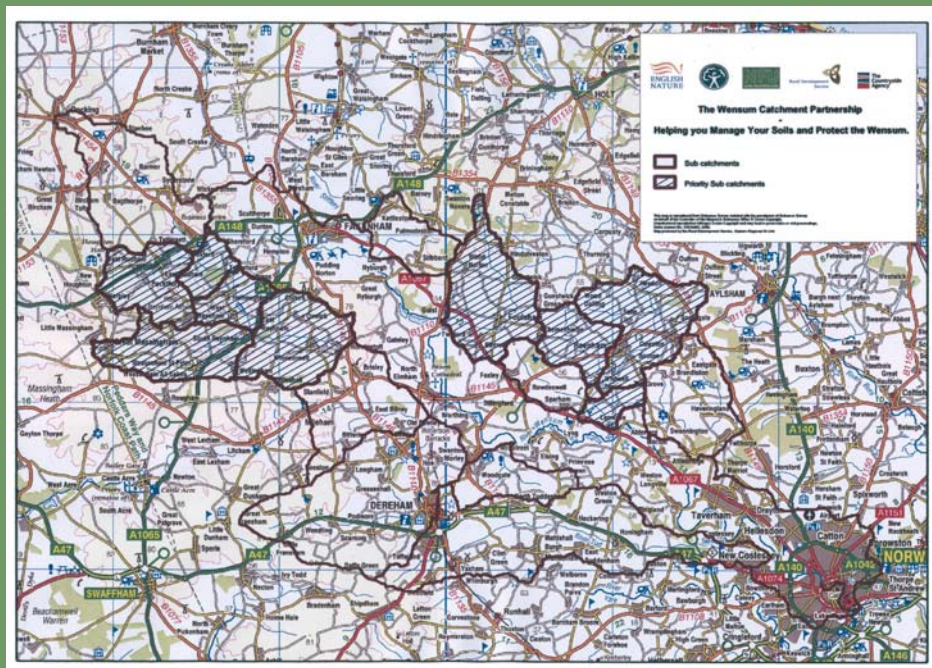


Figure 3 – Priority sub-catchments for the River Wensum, Norfolk

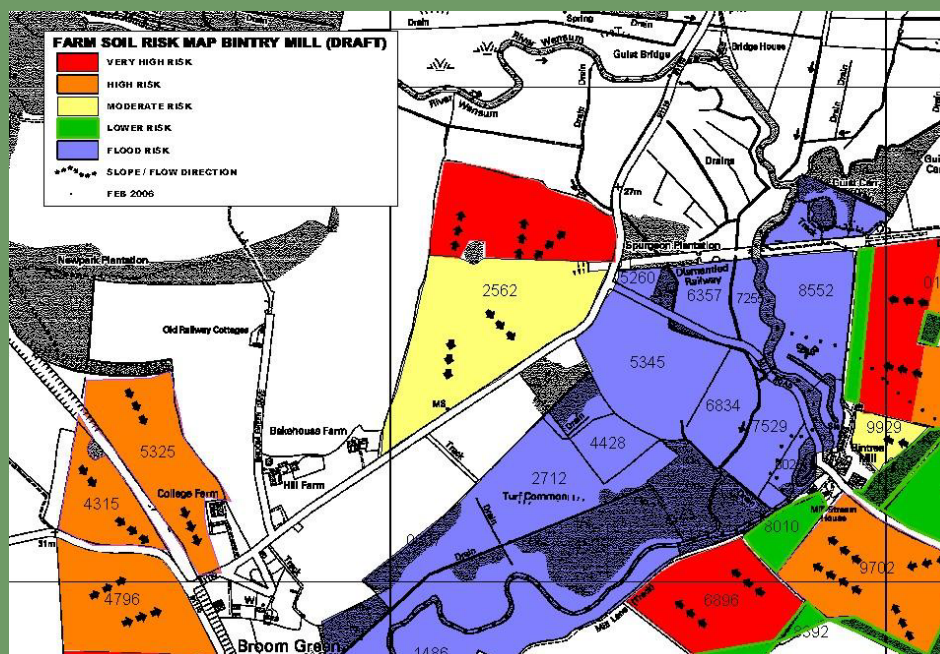


Figure 4 – Farm soil risk map, Bintree Norfolk (River Wensum catchment)

## Trees and water

- Trees and woodlands can impact on both water quality and water quantity.
- Water draining from well-managed woodland tends to be of high quality with low concentrations of nitrate, phosphate, sediment and pesticides. This reflects the minimal use of fertiliser and pesticides and the generally low level of soil disturbance under woodland compared to agriculture. Woodland creation can therefore make a significant contribution to reducing diffuse pollution from agriculture. Benefits can be maximised by targeting high risk soils and careful placement of new woodland on appropriate sites to intercept sediment laden and nutrient-rich runoff, e.g. along downslope field boundaries, runoff source areas, infiltration basins and riparian zones
- Water quantity can be modified in two ways. The amount of water is potentially less from woodland compared to agriculture, depending on climate, soils, geology and woodland type, design and management factors. Water yield is likely to be significantly reduced under conifer forest and crops of short-rotation coppice but similar to or slightly higher for native broadleaved woodland on soils well supplied with water (e.g. overlying chalk). Woodland can also affect the timing of run-off by enhancing the infiltration of rainwater into the soil. This may help to reduce local flooding, especially where woodland replaces agricultural practices that tend to result in soil compaction and surface capping.
- The planting or restoration of floodplain and riparian woodland in association with the development of more natural river flows has been shown to retain more water on the floodplain. The presence of tree and shrub stems, buttresses, stumps and fallen deadwood form a significant physical barrier to flood flows, which can reduce downstream flooding and hence benefit flood defence.
- Trees and woodlands contribute greatly to the biodiversity of the East of England. Wet woodland (woodland which is established on land subject to seasonal flooding and/or with a high water table) is particularly important to the region. It is a key Biodiversity Action Plan target and the most diverse and species rich of all our terrestrial habitats. Wet woodland along watercourses can also benefit aquatic habitats by the input of woody debris and leaf litter, as well as by regulating water temperature via canopy shade. The latter benefit is expected to become increasingly important as climate warming threatens salmonid fish and other temperature-sensitive freshwater life.

## Forestry Commission and ECSFDI co-operation

- Co-operation between FC and ECSFDI officers in the East of England has begun with a joint field seminar based at Easton College in Norfolk. Some twenty staff were present, including FC National Office/Programme Group attendees and Dr Tom Nisbet, who leads on water and sediment control issues for Forest Research.
- The seminar prompted networking between field staff, and brought each team up to date on the CSF initiative, the role of trees and woodlands, and possible grant aid.
- Important opportunities were identified to contribute to the Water Framework Directive [[www.defra.gov.uk/environment/water/wfd/index.htm](http://www.defra.gov.uk/environment/water/wfd/index.htm)] and to improve the condition of freshwater Sites of Special Scientific Interest [[www.english-nature.org.uk/special/ssi/index.cfm](http://www.english-nature.org.uk/special/ssi/index.cfm)]. This is a novel and exciting use of trees and woodlands.

- It was agreed that trees and woodland could play an important role in reducing diffuse water pollution from agriculture. Specific opportunities include (subject to meeting the UK Forestry Standard [[www.forestry.gov.uk/pdf/fcfc001.pdf/\\$FILE/fcfc001.pdf](http://www.forestry.gov.uk/pdf/fcfc001.pdf/$FILE/fcfc001.pdf)], landscape/archaeological constraints, Environmental Impact Assessment Regulations [[www.forestry.gov.uk/forestry/inf-d6dfkbc](http://www.forestry.gov.uk/forestry/inf-d6dfkbc)] and grant scheme rules):
  - Establishment of wet woodland (National Vegetation Classification W1-W7) [[www.jncc.gov.uk/page-2656](http://www.jncc.gov.uk/page-2656)] in the floodplain and on land with a high water table or subject to seasonal flooding. There may be landscape and biodiversity conservation sensitivities to some floodplain planting (e.g. loss of wet grassland for breeding wading birds). Grant may be available both through the Forestry Commission's English Woodland Grant Scheme (EWGS) [[www.forestry.gov.uk/forestry/inf-d6dccn](http://www.forestry.gov.uk/forestry/inf-d6dccn)] and Natural England's Higher Level Scheme (HLS) [[www.defra.gov.uk/erdp/schemes/hls/default.htm](http://www.defra.gov.uk/erdp/schemes/hls/default.htm)].
  - Establishment of woodland buffer areas (both wet woodland and other native "dry" woodland). This might consist of a strip of woodland of a minimum of 25m in width running parallel to a watercourse. The pollutant retention function of the buffer could be enhanced on the upslope side by including a grass or uncultivated margin, particularly during the thicket stage following woodland establishment when ground vegetation may be more sparse. Gaps in the woodland buffer would need to be carefully designed to ensure that polluted runoff from the adjacent land did not bypass the strip. Care is also required to ensure that buffer areas are appropriate and integral to the landscape. The use of non-native woodland species may be appropriate in some circumstances. Grant may be available both through EWGS and HLS, but note that EWGS would not normally be paid on areas less than 0.25ha and no narrower than 30m on average.
  - Establishment of woodland as a replacement crop on fields rated as of "very high" or "high" risk (i.e. red or amber). Any form of woodland would increase soil permeability and reduce contamination, but care would be required to choose species with a relatively low water demand, especially in catchments at risk from water abstraction. In general, native broadleaved species have a lower water demand than conifer, and may be more appropriate in landscape and biodiversity grounds. Although short rotation coppice (fast growing willows, poplar etc) or other Energy Crops (Miscanthus) may be an option, their higher water use and the level of intervention in terms of harvesting and weed control may reduce the benefits for water. Grant may be available both through EWGS and HLS. Grant may be available for Energy Crops from DEFRA [[www.defra.gov.uk/funding/schemes/ecs.htm](http://www.defra.gov.uk/funding/schemes/ecs.htm)]

## Amendment to the Woodland Creation Grant scoring form

- In the East of England the Forestry Commission has piloted a scoring form for Woodland Creation Grant applications. Each application is scored for its contribution to the priorities of the Regional Woodland Strategy and, subject to budget, those scoring the highest are offered grant [[www.forestry.gov.uk/forestry/inf-d6dcegu](http://www.forestry.gov.uk/forestry/inf-d6dcegu)].
- The form has now been to reflect the emergence of the Catchment Sensitive Farming initiative. The inclusion of points for CSF is fully compatible with Regional Woodland Strategy priorities. Initiative NE2 of the Strategy is to: "Promote woodland planting and management to help protect other natural resources as part of integrated sustainable land management". Specific Strategy Actions NE2a and NE2b refer to the appropriate use of floodplain woodland, and the use of woodland to improve soil quality, water quality and water quantity.

- Note that wet woodland scores 5 points.
- To score two points, at least 50% of the proposed woodland must lie within the boundary of a Catchment Sensitive Area priority sub-catchment. To score three points, at least 50% of the proposed woodland must lie within the boundary of a Catchment Sensitive Area priority sub-catchment “high risk” area. To score four points, at least 50% of the proposed woodland must lie within the boundary of a Catchment Sensitive Area priority sub-catchment “very high risk” area.
- Applicants can check priority sub-catchment boundaries by using the Land Information Search at [www.forestry.gov.uk/planting](http://www.forestry.gov.uk/planting) (and click on “Land Information Search”).

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(with welcome contributions from Dr Tom Nisbet, Fred Currie, Dougal Mcneill,  
Andrew Smith and Andrew Hoppit)