Creating and implementing a Natural Flood Management Plan Case study: Hempnall





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What is Natural Flood Management?

- Measures that slow the pathway of surface water across land
- Measures that slow the flow in watercourses

What is the objective of Natural Flood Management?

- To delay the arrival of a flood peak downstream where there are properties at risk
- Provide an environmental <u>and</u> flood risk benefit





What's the problem?



Poor land management practices



Silted up watercourses





NFM measures include:

- Reducing soil compaction
- Planting and managing hedgerows/trees
- Cover crops
- Cross drains in farm tracks
- Attenuation basins
- Swales
- Sediment traps and bunds
- Leaky debris dams
- Floodplain restoration/reconnection
- Wetland restoration/creation
- Beavers
- Sand dune regeneration
- Saltmarsh/mudflat restoration
- Beach nourishment















- Hempnall Beck, tributary of the River Tas, part of Yare catchment
- Hydrometric catchment area: 37km²
- Largely arable catchment
- Properties at risk of flooding in Hemphall village
- Flashy catchment quickly rises and receeds







- History of flooding from fluvial and surface water pathways
- Occurrences in 2001, 2014, 2016, 2017 and 2020
- Storm Bella in Dec 2020 was one of the most extreme rainfall events observed in recent years resulting in 9 properties experiencing internal flooding







Objective:

- Slow flow and change land management practices in the upper reaches – above properties
- Every little helps but not a silver bullet
- More is needed to have a greater impact







- Identify flow pathways making their way to Hempnall
- Black arrows = direction of flow
- Use NFM techniques to slow flow pathways down both over land and fluvial routes







Hempnall North watercourse

- Series of leaky dams
- 6m buffer strips
- Hedge planting
- Increase storage in areas 1, 2 and 3
- Field bunds
- Increase roughness of buffers, planted up with nectar-rich flowering species to add biodiversity interest as well as slowing runoff







Hempnall South watercourse

- Series of leaky dams
- 6m buffer strips
- Field bund
- Hedge planting
- Increase roughness of buffers, planted up with nectar-rich flowering species to add biodiversity interest as well as slowing runoff











Leaky dam

Buffer strip

Field bund

- Revised CS scheme includes NFM actions that will provide capital and revenue payments for land managers undertaking NFM measures on their land
- If only there was a resource specific to the Anglian region that detailed all the info associated with such measures.....





An intro to the Natural Flood Management Handbook

- Part of the reform of the UK's agricultural policy since leaving the EU is the phased introduction of Environmental Land Management Schemes (ELMS).
- The ELM offer is comprised of the Sustainable Farming Incentive (SFI), a revised Countryside Stewardship (CS) scheme and the Landscape Recovery scheme.
- SFI and CS offer payments to land managers to deliver additional environmental goods and services alongside food production.
- The revised CS scheme includes NFM actions that will provide capital and revenue payments for land managers undertaking NFM measures on their land.
- Handbook aims to highlight what tools are available that meet the twin challenge of delivering for the environment (specifically through NFM), whilst also maintaining current levels of food production.

https://norfolkriverstrust.org/wp-content/uploads/2024/02/NFM-Handbook-East-Anglia.pdf





Anglian (Eastern) Regional Flood & Coastal Committee



Catchment Sensitive Farming

Working together for a healthy environment



A practical guide for farmers and landowners in the Anglian region







1.1 Increasing soil permeability: reducing soil compaction



Natural Flood Management purpose

- Managing soil compaction is one of the most effective treatments farmers can undertake to reduce overland flow and lower flood risk at a local scale.
- It can help to increase the amount of water held in the soil over a wide area.
- It also improves connectivity with groundwater by promoting strong root growth.

Agricultural benefits

- Increase yields, crops and grass
- Increase grass competitiveness against rushes
- Reduce soil erosion, keeping a valuable resource where it should be
- Reduced loss of fertilisers and pesticide into nearby ditches and burns, saving you money
- Better soil infiltration, reducing waterlogging so the field may be accessible earlier in the season.

Q Considerations

Change or vary tillage practices on the field e.g. minimum tillage or vary ploughing depths

FACT: Runoff from compacted soils is 50-60% higher than on aerated healthy soils**

Compaction is where soil has been squashed into a solid, impermeable layer, either at the surface or within the topsoil. This band restricts the movement of air, water and nutrients down through the soil profile. The effects of soil compaction can be detrimental to grass and root growth, reducing the

ability of grass to pick up nutrients—particularly nitrogen and water—from the soil. It creates conditions for waterlogging and poaching and increases the risk of runoff, leading to soil and nutrient loss. Wet soils stay colder for longer, reducing the number of available grazing days. They can also make harvesting difficult, which is likely to reduce the quality of the resulting silage or crop. Soil compaction can be caused by a range of things, from grazing livestock to farm machinery.



- To Method
- Undertake soil test to identify pH; consider adding lime if it's below 6. This encourages separation of soil particles from one another, creating air pockets.
- Mechanically aerate soils using spiked aerators, subsoiler or sward lifter, depending on the depth of compaction.
- Undertake minimal tillage for arable crops or when considering re-seeding.
- Managing crop and livestock rotation can help to reduce compaction, while also improving soil fertility and yield.
- Avoid using heavy machinery on wet soils and use low pressure tyres to further protect from compaction.
- Consider re-seeding or overseeding using deep rooting plant species – e.g festulolium and clovers for grassland.

Costs



Funding

There are a range of financial incentives available through Environmental Land Management (ELM) that contain a range of options for Soil Management. See links below and on pages 13, 15 and 17.

Benefits summary

- Environm Water quality improvement: improved ental infiltration and sedimentation, retaining eroded particles carrying pesticides and phosphorus.
- Social Reduced risk of fluvial, surface water and groundwater flood: Improved soil stability, less surface run-off and more infiltration.
 - Air quality: Soil conservation reduces wind erosion.
- Cultural Aesthetic & cultural value: where accessible, improved landscape aesthetics provides opportunities for physical activity and mental relaxation.



Compacted soil: water movement restricted, due to compacted pores resulting in increased runoff.





Un-compacted soil: Water free to move through pores and fissures, resulting in reduced runoff.

Additional Information

https://www.gov.uk/countryside-stewardship-grants/winter-cover-crops-sw6 https://www.gov.uk/countryside-stewardship-grants/equipment-to-disrupt-tramlines-in-arable-areas-rp31 https://www.gov.uk/countryside-stewardship-grants/in-field-grass-strips-sw3 https://ahdb.org.uk/projects/documents/ThinkSoils.pdf https://www.gov.uk/government/publications/agricultural-transition-plan-2021-to-2024/technical-annexthe-combined-environmental-land-management-offer#species-recovery-and-management

**Agriculture and Horticulture Development Board (AHDB), 2016





1.2 Creating and managing buffer strips



- Vegetation in the grass strip increases the roughness of the land surface, which slows the flow of runoff and increases infiltration.
- Buffer strips trap sediment and reduce sediment flow into watercourse.
- They stabilise the banks of watercourses, helping prevent erosion and siltation from bank material.

Method

Riparian buffer strips should be a minimum of 4m wide for maximum effect, and may require fencing to exclude livestock from the river banks. In-field buffer strips should be 2m wide. Planting native tree species within the buffer strip increases benefits for NFM and wildlife.

Key locations

- Throughout the catchment, adjacent to rivers, and especially on grazed land next to streams and ditches that suffer from high sediment loads.
- In-field strips on arable land at risk from soil erosion. This option works well alongside other run-off intercepting options, such as contour bunds and hedgerows.
- Creating a network of grass strips next to watercourses and ditches - known as riparian buffer strips - can provide a physical barrier that helps restrict the flow of storm water, carrying sediment and nutrients, and preventing them from being washed from the field into the watercourse.

In-field buffer strips, as their name implies, are found adjacent to field boundaries and across fields. They can reduce overland flow impacting roads and neighbouring properties.

Agricultural benefits

- Buffer strips trap and filter runoff, preventing loss of fertilisers, sediment and pesticides. Ten metre wide strips reduce sediment loss by 30%.
- They reduce frequency of ditch management through decreased rates of siltation and weed development from increased nutrient levels.
- They enhance crop management operations by straightening irregular field edges.
- They control or prevent erosion of valuable top soil from fields into watercourses, so reducing contamination by silt and organic wastes.
- They help reduce nitrate leaching by vegetation growing on the buffer strip absorbing nitrogen.
- They create wildlife corridors and sites for ground nesting birds, small mammals and beneficial pollinator insects.
- They reduce effects of spray drift.
- By building a small mound down the in-field buffer strip, a beetle bank can be created, further benefiting the wildlife and encouraging natural predators of crop-eating insects.

Considerations

Q

- Implementation next to main rivers may require Environment Agency consent, if it is to be fenced against livestock.
- Shrubs such as hawthorn and hazel interspersed with alder, willow and birch are beneficial for slowing runoff and stabilising riverbanks.
- Maintenance of field buffer strips will depend on the land use, but fertilisers and manures should not be used.

Costs	
Set up costs:	Maintenance costs:
Low	Low
U Level of mainte	enance required
Low	

Funding

Environmental Land Management (ELM) contains a range of options for creating and managing buffer strips, grass margins and riparian management strips. See links below for more information.

Soil and land management

Qualit

Climate

Regulation

Low

Flows

Cultural Activity

Aestheti

Quality

Flood (

🗳 Benefits summary

- Environm Water quality improvement: buffers ental improve infiltration and sedimentation,
 - retaining eroded particles carrying pesticides and phosphorus. Habitat provision: for pollinators; birds, invertebrates.
- Social Reduced risk of fluvial, surface water and groundwater flood: Improved soil stability, Iess surface run-off and more infiltration
 - Air quality: reduces wind erosion, contributing to improved local air quality.
- Cultural Aesthetic & cultural value: where accessible, improved landscape aesthetics provides opportunities for physical activity and mental relaxation.



https://www.gov.uk/countryside-stewardship-grants/4m-to-6m-buffer-strip-on-cultivated-land-sw1 https://www.gov.uk/countryside-stewardship-grants/riparian-management-strip-sw11

https://www.gov.uk/countryside-stewardship-grants/12m-to-24m-watercourse-buffer-strip-on-cultivated-landsw4

https://www.gov.uk/countryside-stewardship-grants/buffering-in-field-ponds-and-ditches-on-arable-land-wt2 https://www.gov.uk/countryside-stewardship-grants/beetle-banks-ab3

https://www.cfeonline.org.uk/environmental-management/grass-buffer-strips-next-to-a-watercourse-or-pond/www.cfeonline.org.uk/2-in-field-grass-strips-to-avoid-erosion

https://defrafarming.blog.gov.uk/create-and-maintain-beetle-banks/

 $https://www.gov.uk/government/publications/agricultural-transition-plan-2021-to-2024/technical-annex-the-combined-environmental-land-management-offer {\combined-environmental-land-management} for the transition of transition of$



SW2: 4m to 6m buffer strip on intensive grassland - **£235 per Ha**

SW4: 12m to 24m watercourse buffer strip on cultivated land -**£707 per Ha**

SW1: 4m to 6m buffer strip on cultivated land - £515 per Ha

14 East Anglian Natural Flood Management Handbook

1.3 Planting and managing hedgerows



Newly planted hedge. Source: W.Baxter, Wiki media Commons.

- Natural Flood Management purpose
- Hedgerows provide excellent natural weather barriers and habitat for wildlife, but also perform a natural flood management function by intercepting rainfall, slowing overland runoff and increasing infiltration.
- Hedgerows trap sediment, reducing the amount of sediment and diffuse pollution reaching watercourses.

Method

- Prepare the ground along a 1.5m wide strip to provide good soil conditions and as little competition from other vegetation as possible.
- Plant a double staggered row hedge using 6 plants per metre.
- Up to 75% of the species can be thorns for example, hawthorn and blackthorn.
- Consider a mix of shrub species, including hazel, geulder rose, rowan and holly, to enhance the hedgerow for wildlife.
- Add in an oak, lime, aspen or alder every 10 m to grow out into a single landscape tree for additional future shade and shelter.

- Use a 1.2 m guard to protect the standard tree as it grows.
- Fence off the plants, keeping fences far enough away so the hedgerow can grow at least 2 m in width.
- Rabbit netting may be needed, either on its own or with stock fencing, if there is a known problem with rabbits or hares.
- Remove individual guards and tree shelters once the plants are established.

Considerations

- Planting should be carried out between November and March.
- Up to 75% of the species can be thorns for example, hawthorn and blackthorn.
- Consider a mix of shrub species, including hazel, guelder rose, rowan and holly, to enhance hedgerow for wildlife.
- Hedgerows are an intrinsic part of the landscape and in many places owe their existence to the need to divide grassland into conveniently-sized grazing pastures for livestock.
- If new hedgerows are planted consider linking existing hedgerows and habitats.

Key locations

- Across a slope where runoff occurs or perpendicular to the river in a floodplain.
 Where hedgerows have been lost from an area or
- the network is very fragmented.Also consider restoration and management in
- areas where there are good networks of hedgerows.

Agricultural benefits

- Hedgerows create areas of shelter and shade for livestock.
- They trap and filter runoff, preventing loss of fertilisers, sediment and pesticides.
- Animal health may also be improved through reductions in standing water from increased infiltration rates.
- They can reduce the impact of wind erosion on sandy soils.

- Hedgerows provide a barrier to the spread of disease, reducing animal-to-animal contact.
- They provide habitat for farmland birds and beneficial insects.
- Combined with adjacent sown or unploughed field margins, hedgerows are of far greater value for wildlife providing the link between nesting, feeding and refuge zones.

Costs

Set up costs:	Maintenance costs:	
Medium	Low	

U Level of maintenance required

High

- Newly planted hedges will require annual maintenance until at least 1.5m tall, particularly with regard to weed control, cutting every two years from then on to ensure life of hedgerow. Cutting to a box shape will increase benefits for wildlife, as well as shelter for stock.
- The laying of hedge every 8-15 years will increase wildlife benefits and the overall health of the hedge.

E Funding

There are a range of financial incentives available through Environmental Land Management (ELM) that contain a range of options for Planting and Managing Hedgerows. See links below for more information and payment rates:

Additional Information

https://www.gov.uk/countryside-stewardship-grants/hedgerow-laying-bn5 https://www.gov.uk/countryside-stewardship-grants/hedgerow-coppicing-bn6 https://www.gov.uk/countryside-stewardship-grants/hedgerow-gapping-up-bn7 https://www.gov.uk/countryside-stewardship-grants/planting-new-hedges-bn11 https://www.gov.uk/guidance/england-woodland-creation-offer

https://www.woodlandtrust.org.uk/plant-trees/trees-for-landowners-and-farmers/morehedges/ https://www.gov.uk/government/publications/agricultural-transition-plan-2021-to-2024/technical-annex-the-

combined-environmental-land-management-offer#species-recovery-and-management

Benefits summary

Environ- Water quality improvement: Hedges mental improve infiltration and sedimentation, retaining eroded particles carrying pesticides and phosphorus. Habitat provision: for pollinators; birds,

Social Reduced risk of fluvial, surface water and groundwater flood: Improved soil stability, less surface run-off and more infiltration.

> Air quality: reduces wind erosion, contributing to improved local air quality.

Cultural Aesthetic & cultural value: where accessible, improved landscape aesthetics provides opportunities for physical activity and mental relaxation.

Soil and land management



Planting new hedges - £22.97 per metre

Management of hedgerows - £13 per metre

Planting standard hedgerow tree - **£19.06 per tree**





2.3 Sediment traps and bunds



Natural Flood Management purpose

Sediment traps target known overland flow pathways, they can disrupt and attenuate overland flow, slowing the time taken for the water to reach the channel and potentially reducing the flood peak. Bunds are created by excavating earth locally to create a mound, which act to halt a runoff pathway. Both reduce siltation of watercourses, by allowing sediment to drop out of suspension as well as slowing the flow of water.

Q Considerations

- Consent may be required to remove and spread sediment caught in a sediment trap.
- Sediment traps are not intended to treat wastewater or effluents.
- Sediment traps can also be used as a pretreatment for water running into a temporary storage area.
- Earth bunds work most efficiently when located across known runoff pathways which appear following heavy rainfall or when the soil is saturated.
- Sediment traps can take many forms, but normally comprise an excavation located on a surface runoff pathway.
- Runoff enters the excavation and is detained there, allowing sediment to settle out before the runoff is discharged, usually via a gravel outlet.
- Sediment traps are unlikely to derive significant flooding benefits on their own. However, when used in conjunction with other runoff

management features, they can help to control the release of sediment to the river network.

Agricultural benefits

- Runoff water is slowed, which allows sediment to be deposited and collected for reuse on farm.
- Settlement traps can be small or large to fit farm size and requirement.
- The creation of traps and bunds provides a barrier to prevent to excess nutrients reaching water courses.

Method

- Bund height should be created from compacted subsoil and should not exceed 1.3m.
- The slope of the sides should be less than 1 in 4 or gentler and vegetated. Where a bund is used to create a sediment trap (such as in a low corner of a field) the field side bank should be as gentle as possible, ideally no steeper than 1 in 20, to provide a filter strip function. Ensure access is provided for maintenance.
- The size will depend on runoff volumes to be intercepted; however, the greater the scale, the greater the removal efficiency.

Key locations

0

- Slopes prone to runoff during flood events.Areas where runoff with a heavy sediment load is
- an issue.
 Where runoff would otherwise enter a watercourse

() Level of maintenance required

Variable: Sediment traps will need to be regularly emptied – the frequency will depend on the area being drained and how much sediment is carried by the stream or ditch. Removal of sediment and respreading to land will require a waste exemption license from the Environment Agency (EA).

COSIS		
Set up costs:	Maintenance costs:	
Low (depending upon scale)	Low	

East Anglian Natural Flood Management Handbook 27



Water quality improvement: sediment deposition, reduced diffuse pollution Habitat provision: creation of habitats for a range of aquatic mammals, amphibians and invertebrates, as well as farmland birds Climate regulation: carbon sequestration Low flow regulation: permanent features provide storage areas for times of drought. They promote infiltration, enabling groundwater

Reduced risk of fluvial, surface water and groundwater flood: Reduction in flood risk through water storage.

Aesthetic & cultural value: wetlands are valued as distinctive landscape features and can provide recreation opportunities, aesthetic and health benefits.



Additional Information

https://www.gov.uk/countryside-stewardship-grants/sediment-ponds-and-traps-rp7 https://www.gov.uk/countryside-stewardship-grants/earth-banks-and-soil-bunds-rp9 https://www.gov.uk/government/publications/agricultural-transition-plan-2021-to-2024/technical-annexthe-combined-environmental-land-management-offer#species-recovery-and-management

28 East Anglian Natural Flood Management Handbook

Sediment pond - £11.88 per square metre Swale - £7.53 per square metre Earth bank and soil bund - £195.61 per 100m



2.4 In-channel leaky barriers/leaky debris dams



A network of in-channel barriers installed on a local scale can control channel flows. The dams are created to be slowly leaky, draining the trapped water once the flood period has passed. In-channel barriers could reduce the 1 in 100 year flood peak by 20%. Dams can be constructed so that floodwater spills onto the floodplain for additional temporary storage where conditions are suitable.

Key locations

- In-channel barriers are generally suited to smaller water courses and ditches throughout the catchment, where holding water back is not going to create additional problems.
- Steep woodland in the upper catchment, recommended to be implemented alongside runoff attenuation features; for example, understory planting.
- They can also be located within fields on overland flow pathways.

Õ Considerations

- · Avoid areas in close proximity to bridges and culverts to reduce blockage
- To ensure efficacy, many barriers are likely to be needed in a catchment. Their implementation will need careful planning to make sure that the overall pattern of flood flows is not altered, as this can cause flood peaks to coincide.
- Debris bundles can also be constructed in wooded areas to further roughen the surface of

floodplain and trap overland flows.

- Local materials should be used where possible Use untreated wood where possible, however,
- tanalised timbers are acceptable.
- They can block fish passage at low flows, become blocked if positioned too close to the bed level.
- If bank scour is an issue, consider putting a notch in the top of the woody debris to allow water to pass over.
- When whole trunks, secured into place with stakes and wires, are used they are often known as large woody dams.
- The dams are set above normal stream level, so only flood flows are blocked and they don't interfere with normal flow conveyance.
- Water is stored within the channel behind constructed dams, reducing the downstream flood peak by slowing the flow.
- · Should not be located just downstream of a land drain

Agricultural benefits

Dams can successfully reduce localised flooding within the farm holding. Sediment trapped behind each structure is nutrient rich and can be reused on the farm.

Method

Large woody dams are created by laying two large tree trunks in a cross formation across the channel to rest safely on both banks, wedged in position. Smaller timbers can be wedged in place between the larger ones.

- Leaky dams are constructed by securing a support across the channel and securing slats, either horizontally or vertically to form a discontinuous barrier.
- Varying the height of the timber above normal river flow will determine the rate and volume of retained floodwater. This will also permit fish passage. A permit may be needed from the relevant RMA, please discuss prior to installation.

Ese Funding

Various financial incentives available, see links to options and payment rates.

Costs		
Set up costs:	Maintenance costs:	N
Low	Low	c
🔮 Benefits summary		
Environment Water quality improvement: m		a

benefit for sediment retention and nutrient reduction through phosphate and nitrate uptake. Habitat provision: Improved habitat diversity by creating pools and varied channel morphology, support fish and macroinvertebrates.

Climate regulation: increased resilience to climate change by regulating temperature and water level.

Low flows: Can divert low and high flows, providing respite for organisms from flooding and drought events.

Reduced risk of fluvial, surface water and groundwater flood: create additional water storage capacity and roughness, which can capture flood flows and slow it.



Additional Information

Social

https://www.gov.uk/countryside-stewardship-grants/rp32-small-leaky-woody-dams https://www.gov.uk/countryside-stewardship-grants/rp33-large-leaky-woody-dams https://www.gov.uk/countryside-stewardship-grants/check-dams-rp12 https://www.gov.uk/government/publications/agricultural-transition-plan-2021-to-2024/technical-annex-thecombined-environmental-land-management-offer#species-recovery-and-management

Level of maintenance required

edium Large woody dams will need periodic tecking to ensure the logs are still wedged in the ght position. They may also require periodic learance of debris to prevent complete blockage nd overflow of water.

Leaky barriers





Small leaky dam - £461.29 per dam Large leaky dam - £764.42 per dam





Consents and contacts

Some interventions may require consent prior to construction. It is recommended that you speak to your local Environment Agency Natural Flood Management Advisors in the first instance to help work out what types of consent may be required:

helen.george@environment-agency.gov.uk or

karen.paterson@environment-agency.gov.uk

Permits for work on watercourses and floodplains

If you're considering works that are on or nearby to a watercourse (river, stream, ditch, drain, culvert, dyke) you must first contact the relevant Risk Management Authority (RMA) to find out what permissions are required before you start. The RMA depends on what type of watercourse you're considering works on:

If it's a **Main River** (within 8m of the main river or within 16m if coastal), a Flood Risk Activity Permit from the Environment Agency may be required. See 'Main River map' https://www.arcgis.com/apps/webappviewer/index.html?id=17cd53dfc524433980cc333726a56386

For further permitting advice see, <u>https://www.gov.uk/guidance/flood-risk-activities-environmental-permits</u> or contact <u>PSO.Eastanglia@environment-agency.gov.uk</u>.

If it's an **Internal drainage board (IDB) arterial watercourse** (within 9m), a Land Drainage Consent may be required from the relevant board which can be checked here: <u>https://www.ada.org.uk/idb-map/</u> where contact detail for further advice can also be found.

For any other watercourse, contact your Lead Local Flood Authority (either unitary authorities or county councils) as you may require Ordinary Watercourse Consent for works in the channel.

Areas with protected status

Interventions that are proposed to be undertaken on land with protected status such as Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC) and Special Protection Areas (SPA) will require Natural England consent. Interventions on SAC or SPA land will also require a habitat regulations assessment from Natural England. It is possible to find out whether your site has protected status by searching online using the website www.magic.gov.uk.

Scheduled Monuments

Scheduled Monuments Consent will also be required for intervention measures proposed to be undertaken on or near to Scheduled Monuments. It is possible to find out whether your site has protected status by searching online using the website www.magic.gov.uk or by contacting Historic England. Historic England www.historicengland.org.uk

Planning Consent

Planning permission may be required may be required for larger schemes, a discussion about proposed works should be held with the local planning authority (County Council or National Park Authority).

New woodlands

An Environmental Impact Assessment (EIA) may be required if more than 2ha of woodland planting is grant funded from sources other than the national agri-environment schemes. Contact the Forestry Commission for further information and support: adminhub.buckshornoak@forestrycommission.gov.uk

Norfolk County Council: water.managment@norfolk.gov.uk Suffolk County Council: floods@suffolk.gov.uk Essex County council: floods@essex.gov.uk Cambridgeshire County Council: floodandwater@cambridgeshire.gov.uk Bedford Borough Council: floodrisk@bedford.gov.uk Central Bedfordhsire Council: floodrisk@centralbedfordshire.gov.uk Milton Keynes City Council: Ilfa@milton-keynes.gov.uk Buckinghamshire County Council: floodmanagement@buckinghamshire.gov.uk West Northamptonshire Council: floodandwater@northamptonshire.gov.uk Hertfordshire County Council: floodandwatermanagement@hertfordshire.gov.uk Help and advice: NFM Coordinator Anglian Region: helen.george@environment-agency.gov.uk NFM Advisor Cambridgeshire, Bedfordshire & West Norfolk: karen.paterson@environment-agency.gov.uk Catchment Sensitive Farming advice: csf.northanglia@naturalengland.org.uk Norfolk Rivers Trust: info@norfolkriverstrust.org Essex and Suffolk Rivers Trust: info@essexsuffolkriverstrust.org Great Ouse Rivers Trust: https://www.greatouseriverstrust.org River Waveney Trust: info@riverwaveneytrust.org Norfolk Farming & Wildlife Advisory Group: advice@norfolkfwag.co.uk Suffolk Farming & Wildlife Advisory Group: info@suffolkfwag.co.uk East (Cambs, Essex, Herts, Beds, Northants) Farming & Wildlife Advisory Group: hello@fwageast.org.uk National Trust: mee.customerenguiries@nationaltrust.org.uk Woodland Trust: EasternClaylands@woodlandtrust.org.uk RSPB: eastcoastwetlands@rspb.org.uk Beaver licencing info: beaverlicence@naturalengland.org.uk Water Resources East: https://wre.org.uk/ Further reading Working With Natural Processes Evidence Directory (EA) https://www.gov.uk/flood-and-coastal-erosion-riskmanagement-research-reports/working-with-natural-processes-to-reduce-flood-risk Natural Flood Management Handbook (2015), Scottish Environment Protection Agency (SEPA)

www.sepa.org.uk/media/163560/sepa-natural-flood-management-handbook1.pdf Runoff Attenuation Features (2011), Newcastle University/Environment Agency (EA) <u>https://</u> research.ncl.ac.uk/proactive/belford/papers/Runoff_Attenuation_Features_Handbook_final.pdf

Ciria Natural Flood Management Manual: https://www.ciria.org/ItemDetail?iProductCode=C802F&Category=FREEPUBS&WebsiteKey=a054c7b1-c241-4dd4-9ec1-38afd4a55683 Catchment Based Approach (CABA) https://catchmentbasedapproach.org/learn/what-is-natural-flood-

management/

Broadland Futures Initiative: <u>https://www.broads-authority.gov.uk/looking-after/climate-change/broadland-</u> futures-initiative

Restoring Meadow, Marsh and Reef (ReMeMaRe): <u>https://ecsa.international/reach/restoring-meadow-</u>marsh-and-reef-rememare

Local Nature Recovery Strategies: <u>https://www.gov.uk/government/publications/local-nature-recovery-</u> strategies/local-nature-recovery-strategies

SFI 2024: https://www.gov.uk/government/publications/agricultural-transition-plan-2021-to-2024/technicalannex-the-combined-environmental-land-management-offer#species-recovery-and-management

Local Lead Flood Authorities (LLFA's):

How can CSF support farmers?



1:1 Advice Visits

Your local CSFA can directly provide you advice about how to manage water on your farm. Whether it be from improving soil health, to planting buffers to works in the farmyard. Local farm advisers are happy to walk the farm with you and look at any areas of interest. All advice is free and confidential.

Specialist Advice Visits

Some topic areas may require specialist knowledge. CSF are able to organise specialist advice visits for the farm that can help to slow the flow of water through the catchment, such as:

- Water Flow Management
- Water Holding Structure
- Natural Flood Management
- Sustainable Water Usage





Grant Advice and Support

Your local CSFA can provide you advice and help you access grants that may be available to help you implement works that support Natural Flood Management on the farm. Your adviser will be able to discuss options that are available for management costs and initial capital works.



Slow the flow measures





Farm infrastructure and water holding

Soil health and management



Working with farmers and land managers

- Farming is a business and livelihood
- Important not to blame farmers Having to deal with unprecedented amounts of rainfall
- Have empathy They may have been affected by flooding too







Government opens fund to support farmers affected by flooding

Fund will support farmers who suffered uninsurable damage to their land due to flooding earlier this year with grants of between ± 500 and $\pm 25,000$

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Food security threatened by extreme flooding, farmers warn



Thanks for listening!





