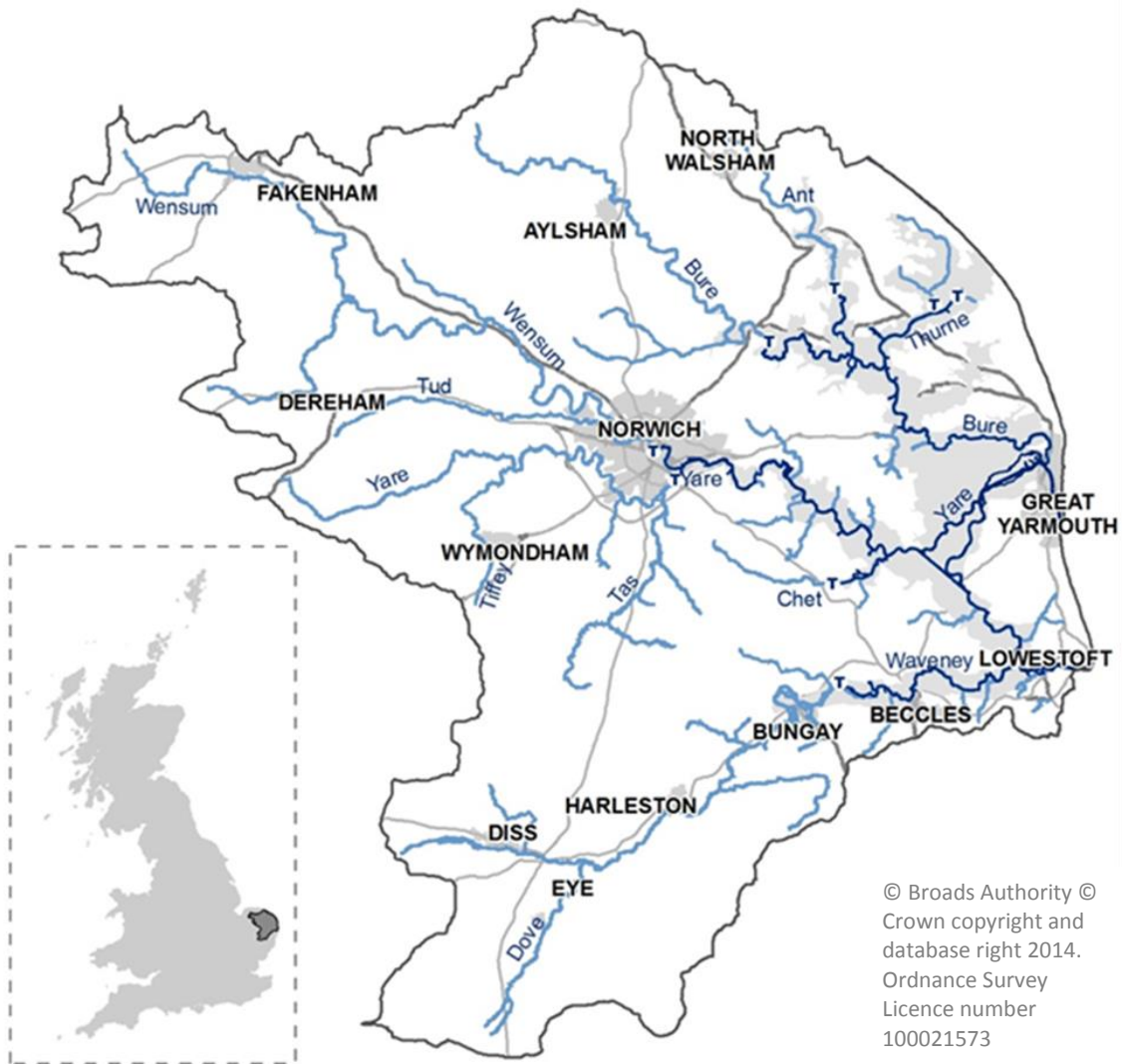


Broadland Catch-up

Newsletter No.14 of the Broadland Catchment Partnership - October 2016



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Welcome to the newsletter of the Broadland Catchment Partnership (BCP). We are working to improve water quality, increase water availability, reduce flooding, and enhance wildlife habitat and recreation by joining up the management of land and water in the **Broadland Rivers Catchment** as shown in the map above.

The catchment includes the area that feeds water into the rivers Bure, Waveney, Wensum and Yare and out to sea at Great Yarmouth.

The aim of this newsletter is to share relevant information. *Please send us articles.*

We focus on voluntary best practice and are involving communities, investor organisations, companies and farmers in working together. We attract funding and co-ordinate its targeted delivery to improve the catchment for shared benefits.

If you want to join the partnership, have any queries, or wish to unsubscribe from this newsletter please contact: Neil Punchard, Broadland Catchment Partnership Officer - Mobile: 07900 266496
neil.punchard@broads-authority.gov.uk www.broadlandcatchmentpartnership.org.uk



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UPDATES

Salle Silt Traps Complete

The Salle Silt Traps were constructed in September.



Salle Silt Trap © Matt Philpot

- Three schemes intercept water run-off from local roads and a sugar beet pad that previously flooded the road and ran directly into the Blackwater Drain.
- The Blackwater Drain flows into the River Wensum and ultimately the Broads National Park. These waterbodies are protected for their wildlife and they also provide drinking water to local communities.
- The silt traps receive and slow down a large volume of water which allows suspended solids to settle out and clearer water to discharge to the drain.
- The solids can have pollutants attached to them and can also smother gravels that are an important habitat for river flies and fish such as brown trout.
- The traps can be maintained by using a digger to remove the solids that accumulate.

The schemes were designed by the Norfolk Rivers Internal Drainage Board, constructed by Aylsham Plant Hire, and joint funded by: WaterLIFE Water Sensitive Farming 2016-2018; the Environment Agency under the Norfolk Rural Sustainable Drainage System Project 2016/17; and the Salle Estate.

The University of East Anglia is monitoring the effect of these schemes on water quality as part of the Defra Demonstration Test Catchments programme.

The project was facilitated by the Broadland Catchment Partnership that thanks the Salle Estate for its assistance during construction and the generous provision of land.

Contact: neil.punchard@broads-authority.gov.uk

NORMAC Cultivations Demonstration 2016

This year's Norfolk Farm Machinery Club's cultivation demonstration event was at Hardingham Farms on the 8th September. A great variety of shiny new kit, from manufacturers and local dealers, was seen in work across the 200 acre site by a large number of visitors. At the request of the club, who wanted soil management to feature this year, CSF ran a static stand with a soil profile pit ably manned by Philip Wright, a well-respected soil and cultivations expert. Amongst many points demonstrated to visitors, and a surprise to many, was that the subsoil under tramlines was still too plastic for subsoiling to be effective despite it being a dry time, a sandy loam and the general soil moisture deficit following a good wheat crop!

Also, the dramatic reduction in soil porosity behind the combine wheelings - despite these being barely detectible in the hard dry conditions. Avoiding and resolving soil compaction at various depths was discussed at length.



Phillip Wright in the soil pit © Neil Punchard

A great deal of curiosity was aroused by the strange "Lland- Ho Earthwake" tool designed to cut grooves across tramlines to shed surface water and prevent accumulating flow and scouring.

Other demonstrations around the site included tyre pressures, strip till and drill equipment to help maintain good soil condition and soil organic matter.

Advisers from Natural England, water companies and the Norfolk Rivers Trust worked together to answer queries around stewardship and resource protection. All in all, much food for thought and ways to improve soil management went back home at the end of the day!

Contact: robert.camps@naturalengland.org.uk



Wensum DTC Update 1: three-stage biobed reduces on-farm pesticide pollution risk

A two year research program (2013–2015) by the Wensum DTC, in partnership with the Environment Agency and the Salle Estate, found that a lined compost-straw-topsoil biobed reduced total pesticide concentrations in waste machinery washings by over 90%, thus minimising both surface water and groundwater pollution risk.

© Richard Cooper



The facility consisted of an enclosed machinery wash-down unit (stage 1), a 49 m² lined compost-straw-topsoil biobed (stage 2), and a 200 m² drainage field with a trickle irrigation system (stage 3). Pesticide concentrations were analysed in water samples collected fortnightly between November 2013 and November 2015 from the biobed input and output sumps and from 20 porous pots buried at 45 cm and 90 cm depth within the drainage field. The results revealed that the **biobed removed 68–98% of individual pesticides** within the contaminated washings, with the average total pesticide concentrations reducing by 91.6% between the biobed input and output sumps. **Drainage field irrigation removed a further 68–99% of individual pesticides**, with total average pesticide concentrations reducing by up to 98.4%. The average total pesticide concentration after biobed and drainage field treatment (57 µg L⁻¹) was 760 times lower than the average concentration recorded before treatment in the input sump (43,334 µg L⁻¹).

The cost of the biobed including the pipework, pumps, liner, matrix material and labour, was approximately £4300 and the cost of the drainage field infrastructure was around £1700. Replenishment of the matrix material two years after construction cost £8 per square metre. The most expensive part of the system was £90,000 for the construction of the large wash-down unit and equipping it with mains electricity and steam cleaning equipment, however, simpler facilities would be recommended for wider roll-out.

Update 2: winter oilseed radish cover crops significantly reduce nitrate leaching losses

Over a three year period (2012–2015), the Wensum DTC conducted field trials assessing the effectiveness of cover crops and non-inversion tillage regimes at minimising farm-scale nutrient losses on the Salle Estate. The trial area, covering 143 ha, was split into three blocks - winter fallow with mouldboard ploughing (Block J); shallow non-inversion tillage with a winter oilseed radish (*Raphanus sativus*) cover crop (Block P); and direct drilling with a winter oilseed radish cover crop (Block L).

Soil, water and vegetation chemistry across the trial area were monitored over the 2012/13 (pre-trial), 2013/14 (cover crops and non-inversion tillage) and 2014/15 (non-inversion tillage only) farm years.



©Richard Cooper

Results revealed **oilseed radish reduced nitrate leaching losses in soil water by 75–97%** relative to the fallow block, but had no impact upon phosphorus losses. Average soil nitrate concentrations were reduced by 77% at 60–90 cm depth beneath the cover crop, highlighting the ability of deep rooting oilseed radish to scavenge nutrients from deep within the soil profile. However, employed alone, direct drilling and shallow non-inversion tillage (to <10 cm depth) were ineffective at reducing soil water nitrate and phosphorus concentrations relative to conventional ploughing. Applying starter fertiliser to the cover crop increased radish biomass and nitrogen uptake, but resulted in net accumulation of nitrogen within the soil.

In terms of costs, there was negligible difference between the gross margins of non-inversion tillage (£731–758 ha⁻¹) and conventional (£745 ha⁻¹) operations, demonstrating farm productivity can be maintained whilst mitigating diffuse pollution.

For more information, or to request a copy of this published research, please contact Richard Cooper richard.j.cooper@uea.ac.uk or Kevin Hiscock k.hiscock@uea.ac.uk.

How clothes can harm aquatic life

New studies show that alarming numbers of tiny fibres from synthetic fabrics are making their way from washing machine into the aquatic food chain.

An investigation of tiny plastic fibres (microplastics) in Breydon Estuary has revealed levels comparable to concentrations in studies across the globe. Samples showed the microplastic fibres were ubiquitous within riverine, estuarine and coastal sediments between the Humber Estuary and Great Yarmouth - the likely source of these fibres being release from synthetic textiles.

Norfolk Search and Rescue assisted Andrea Kelly, Broads Authority, in collecting the samples which were sent to University of Leicester, for two separate studies of the potential ecological effect and potential transport routes and sources. The project was also supported by the Witham Fourth District Internal Drainage Board and a number of other organisations.

Every year globally significant flocks of migrant birds, such as plovers, dunlin, godwits and avocets feed in the Breydon Estuary. Attracted by the abundance of invertebrates in the mud, the birds get high calorie food to retain their fat reserves during the winter. Fish also feed on small creatures in Breydon. These invertebrates filter the water for food particles and inadvertently take in plastic fibres.



Zooplankton with ingested micro plastics from Cole et al 2013

This intake of plastic not only creates problems for feeding, breeding and survival of invertebrates, the plastic and the contamination it can absorb (such as persistent organic pollutants) can be transferred up the food chain. Plastics can be introduced via wind and waste water (from washing synthetic fabrics e.g. polyester). The buoyant plastics allow fibres to travel large distances downstream ending up in sediment settlement areas, such as Breydon Water, or the sea. These studies showed microplastic concentrations were shown to vary along a river-coastal profile; with highest concentrations found in estuarine sediments (211 fibres

kg-1), followed by coastal sediment (162 fibres kg-1), and lowest concentrations in river sediment (150 fibres kg-1). Micro fibres have been in the news for several years now.

It is time to take action. Some consumers are turning away from synthetic to natural fabrics, such as cotton, bamboo, hemp and wool. Also some clothing companies are discussing and helping fund solutions such as collection devices that could be thrown into a washing machine to attract and capture plastic fibres and waterless washing machines, in which textiles are washed in pressurized carbon dioxide.

Despite the challenge it seems like this is everybody's problem, with the Broadland Rivers as no exception.

Contact: andrea.kelly@broads-authority.gov.uk

Test Catchment Breakfast Meeting

The last farmer DTC breakfast meeting for 2016 was held in October to provide an update on DTC results and to discuss future agri-environmental policies.



Breakfast Meeting © Emilie Vrain

UEA researchers have been busy counting worms to assess the effects of different cultivation methods in the various field trials. Preliminary results presented at the meeting showed fields which had been direct drilled had the greatest population of worms in the top 2cm of soil.

A highly engaging discussion occurred regarding views on the direction agri-environmental policy should take. Key themes included the need for policy to be longer-term and focussed on improving soil health. It was felt policy should also target supermarkets and improving public awareness, ensuring fair prices for British farmers.

Contact: Emily Vrain E.Vrain@uea.ac.uk

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Pesti-wise initiative

Pesti-wise is a voluntary scheme run by Northumbrian



Water Group (operating as Northumbrian Water in the North East and Essex & Suffolk Water in Eastern England), which aims to improve river water quality by working with farmers and their advisers.

The pilot initiative consists of 5 specific river catchment areas, 2 of which are in Northumberland, 2 in Essex and 1 in Norfolk/Suffolk.

The catchment in Norfolk/Suffolk is the Dickleburgh Stream which joins the Frenze Beck near Diss before entering the River Waveney.

The initiative aims to deliver on-farm guidance and encourage best practice in the use and application of pesticides on arable farms in the five selected catchments. A feature of the scheme is the availability of grants to farmers in the Pesti-wise catchments to help towards the cost of the construction of banded sprayer filling areas, installation of sprayer auto-section shut-off, straw rakes and the use of precision applicators for slug pellet applications.

Nationally the scheme has helped to fund;

- 19 Slug pellet precision applicators
- 7 Sprayer auto-section shut-offs
- 4 Straw rakes
- 7 Sprayer filling areas of which six have been roofed
- 5 Biofilters

Some of these grants have been given to farmers in the Dickleburgh Stream to help them to manage their pesticide applications in an even more precise way to the benefit of downstream water quality in the River Waveney. So far we have engaged with farmers managing 22 holdings in the catchment accounting for 92% (3117 ha) of the land within it.

We have automatic water samplers installed in both the Dickleburgh Stream and the Starston Beck (as a control catchment). We are entering our second year of monitoring so now have a baseline against which we can compare future pesticide levels to detect any improvements in water quality over time.

Pesti-wise grants will be available to farmers in the pilot sub-catchments until March 2017. For more information, please visit: www.eswater.co.uk/your-home/environment/pesti-wise.aspx or contact Catchment Adviser, Ian Skinner on 07919 496949.

Grants for hedgerows



The FWAG Association have gone into partnership with the Woodland Trust to bring a great deal to landowners wanting to plant new hedgerows and woodland.

Hedgerows form the fabric of our countryside, knitting together ponds and woodland, providing habitat corridors across the landscape. Hedgerow are not only a landscape feature, they are an essential resource to much of our farm wildlife as nest sites for birds and overwintering places for invertebrates. They provide fruit in the autumn and winter, and pollen and nectar through the spring and summer. In short, from an ecological perspective, we can't have too many of them.

FWAG groups across the country have a pot of money available to provide **80% of the cost of new hedgerow plants, spiral guards and canes**. Hedgerows must be native and appropriate to the area, and there is a cap on the amount of grant per landholding.

Your local FWAG adviser can give you more information and will guide you through the very straightforward application process. Remember, this funding is provided by the Woodland Trust and the application form has been designed between the trust and FWAG to be as simple and user-friendly as possible.

For anyone who has just completed a Countryside Stewardship mid-tier application, this will be music to your ears and to your computer screen!

The scheme is open from the 1st of October 2016 until 31st of March 2017, whilst funds are available. Plants will be dispatched from November onwards, subject to availability. Landowners must arrange and pay for the planting work to be done.

FWAG and the Woodland Trust are also keen to hear from any landowner who wishes to undertake new woodland planting.

So don't delay, get in touch with your county FWAG adviser today, and get some new hedgerow habitat in the ground this winter.

Norfolk FWAG Tel: 01603 814869

Email: advice@norfolkfwag.co.uk

Suffolk FWAG Tel: 01728 748030

Email: tim.schofield@suffolkfwag.co.uk



EVENTS

Innovative ways to improve soil, water and profits



**A clear solution
for farmers**
CATCHMENT SENSITIVE FARMING



Monday 14 November 2016 10am – 2pm

Lunch provided - refreshments from 9.30am

The Lynton White Institute, Salle Street,
Salle, Reepham, NR10 4SF

Farmers and agronomists are invited to a **free event** that focusses on **novel, cost-effective techniques**

The workshop will draw on local evidence from the Wensum Demonstration Test Catchment, Morley Agricultural Foundation, Cranfield University and ADAS trials related to cultivations and cover crops.

You will get to hear local farmers' and advisers' perspectives on controlled traffic farming, inter-row and tramline management, and the practical benefits and cost savings they can deliver.

A demonstration of Lland-Ho's Earthwake kit for tramline disruption will take place on nearby fields and you can arrange free trials.

Attendees will also have the opportunity to see the Estate's newly installed silt traps for intercepting run-off from a sugar beet pad and register for similar up to 100% grant funding.

Presentations or in field discussions will include:

- **LEAF farmer Andrew Williams** on the Aqueel and Wheel Track Roller for improving crop quality and reducing water usage and run-off in potatoes
- **Ron Stobart of NIAB** on soils, cultivations and cover crop trials for increased yields and reduced costs
- **Richard Cooper of UEA** on recent findings on the benefits of oilseed radish for nitrate capture
- **CSF Lead Adviser Robert Camps** on tramline management and layout to protect your business
- **Ed Salmon on Controlled Traffic Farming** and how all farms can at least be partial adopters
- **Host farmer Poul Hovesen** with practical insights of how to improve soils, protect downstream waterbodies and increase yields

E-mail: neil.punchard@broads-authority.gov.uk by Monday 7 November or call 07900 266496

Please bring outdoor clothes and footwear.

Morley Farm Walk - Soils and Cultivations



Friday 4 November 2016

10am – 1pm

Morley Business Centre, Deopham Road, Morley, Wymondham, Norfolk, NR18 9DF

NIAB TAG and TMAF invite you to a farm walk and discussion at Morley Farms. This event, hosted as part of work for the Sustainable Intensification Research Platform (SIP), will feature field stops around:

- **Soil structure:** what is the 'hole' story? Demonstration of simple and practical soil structure and drainage assessments to be used on your farm.
- **Soil biology:** do you know your worms? A look at the number and species diversity we can find on farm and assessment and identification demonstrations.
- **New Farming systems research:** a field tour and update on the research being undertaken at Morley (supported by TMAF and The JC Mann Trust).

The event will conclude with a short workshop session to discuss practicality and value of the soil assessments, and how best to measure changes in soil quality and health on your farm.

The event will start at 10.15 (tea/coffee from 10.00), finishing with lunch at 1pm, and is free and open to anyone. Booking via the NIAB shop is essential ([here](#)).

Water on the Farm (Norfolk)

Wednesday 2 November 10am-1pm

CFE farm walk looking at chemicals in water and relevant Countryside Stewardship options.

Manor Farm, Shropham, Attleborough, NR17 1DX

Further information and booking details [here](#).

Land Drainage and Ditch Management

Catchment Sensitive Farming, Environment Agency, and Essex & Suffolk Water

Mon 12 December 10am-3pm Blickling

Wed 14 December 10am-3pm Shotford Hall Farm

To book: nicola.robinson@environment-agency.gov.uk

Mobile: 07900 135508

SAVE THE DATE

Farm Business Updates

Tuesday 31 January - Swaffham

Tuesday 7 February - Wortwell