Suffolk Holistic Water Management Project

www.greensuffolk.org/hwmp

Project Update Autumn 2016

The aim of this pilot project is to consider water holistically, looking to manage this valuable resource so as to maximise its economic and environmental benefits and minimise flood risk.

We have various working groups taking forward different aspects of the Holistic Water Management Project (HWMP). The sub groups and their key contacts are listed at the end of the relevant section and more information, meeting notes, and past newsletters are available on the website www.greensuffolk.org/hwmp. A brief outline of the progress of each group since our last update is summarised below.

In July, we were given the opportunity to present the project to the East Suffolk Water Abstractors Group – which was also reported in the *East Anglian Daily Times*. Both the new Minister with responsibility for flooding and water, Dr Therese Coffey MP, and Henry Leveson-Gower, Defra's Head of Water Resources were at the conference and showed great interest in the project. We were able to share with them some of the legislative, regulatory or financial barriers that are challenging the progress of our various strands of work.

1. Felixstowe Peninsula Project:

This project focuses on using IDB drainage water, which is currently pumped out into the Deben Estuary, for irrigating crops and/or public water supply. The water would be held in a large balancing reservoir (approximately 4 Ha) and then piped inland to smaller on-farm irrigation reservoirs or possibly for public water supply.

Eight farmers have already expressed an interest in using up to 850 Ml of water a year - enough to grow crops worth £2.4 million. The proposal could also reduce the environmental impact of abstraction from the Bucklesham Mill River, contributing to a cost effective solution towards reducing the environmental impacts of IDB pumping at Kingsfleet (*picture right)* and may help alleviate the predicted public water supply deficit in East Suffolk over the next 20 to 30 years.

The East Suffolk IDB has been metering the water pumped into the Estuary for over a year and following modelling by the Environment Agency we are now confident that there is adequate water available to satisfy farm demand and make it worthwhile continuing with this project. Figures suggest there is a 4% risk of non-availability in any one year which could be reduced by having sufficient storage capacity to cover more than one season. For details see the water availability modelling presentation.

Water quality monitoring has shown that although some of the drains have a high level of salinity, there is enough fresh water at the Kingsfleet pump to supply the scheme, although we will need to carefully manage pumping rates to keep salinity levels down.

The other key issue being assessed, in discussion with Natural England, is the quantity of fresh water needed to flow into the estuary to ensure there is no adverse effect on the non-breeding wading bird population (the reason for the estuary's environmental designation). A survey is currently underway to establish how and where the birds utilise fresh water flows to enable Natural England to provide better advice on this matter. The other issue being considered is management and enhancement of the eel population in the system.

The next stage will be to undertake level surveys and a study to establish the optimum size and location for the balancing reservoir. Anglian Water will be supporting this work as part of the Water Resources East Anglia project.

We have started conversations with the County Archaeological Services team, conservation bodies and East Anglia One about possible opportunities linked to the project. For example, we may be able to construct the water mains alongside the East Anglia One onshore cable or build priority habitats into the reservoir design. One of the key benefits of the project should be to reduce the current degradation of saltmarsh at the King's Fleet pump and reduce abstraction pressure on the Bucklesham Mill River – one of our most pristine rivers in the county.

At a meeting earlier in the year, land managers interested in the project agreed that the best business model would be for Water Management Alliance/IDB to act as the managing body. The IDB would become the 'water company' and has ability to take out public sector loan to cover capital investment. Discussions will follow about details of decision making re sharing water, rights, obligations, easements, etc. We plan to hold a further meeting with land managers later this autumn. Discussions are also underway with the Environment Agency about the licensing of this 'new water'.

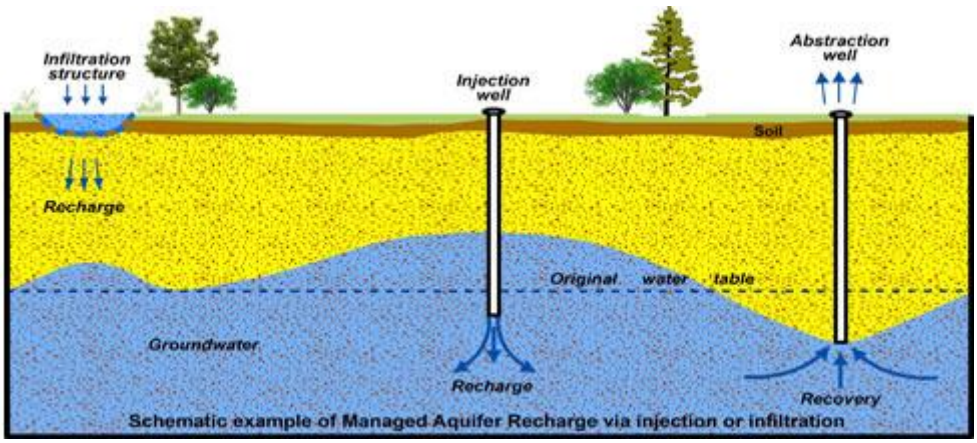
FELIXSTOWE PENINSULA SUB GROUP CONTACTS:

Tim Darby, ESWAG, (Landowner group lead) eswag@btinternet.com
Giles Bloomfield, East Suffolk IDB GilesB@wlma.org.uk

2. Managed Aquifer Recharge:

At the inception of the HWMP, one of the options suggested for enhancing water availability and natural river flow was aquifer recharging. This was not taken forward immediately due to lack of resource, but is now being considered.

Managed aquifer recharge (MAR) is the intentional recharge of water to suitable aquifers for subsequent recovery or to achieve environmental benefits. The concept is to flood an area to allow water to infiltrate naturally or take excess water and deliberately introduce water into the aquifer via a well/ borehole**.** Managed aquifer recharge (MAR) is not a new concept and is used throughout the world – for example 8% of Thames Water's public supply comes from MAR. It offers an alternative to using reservoirs to store excess water. This is predicated on the assumptions that there is available space within the aquifer to store the water and that it can be re-extracted when needed. A vital element is to ensure there is no deterioration in water quality as a result and that river/stream flows are maintained or enhanced. The diagram below illustrates the concept.



Natural aquifer recharge can be enhanced by re-connecting the river with its flood plain, deliberately flooding or winter irrigation of land or using rural Sustainable Drainage Systems (soakaways, swales, etc) to introduce water into the aquifer. It was suggested that this type of recharge downstream of Wickham Market might deliver significant benefit to water supplies further down the catchment – but before taking this forward we need to better understand the system, and it would need a willing landowner to allow regular winter flooding of land. This will be pursued as part of the wider work on natural flood management and enhancement of the river environment, with the added benefit of aquifer recharging.

MAR by introducing water through an injection well/borehole requires high quality water and has a number of technical difficulties – and as such is likely to be more suitable for water companies and larger projects.

The key to the value of MAR is to understand the effectiveness of infiltration measures and water quality implications and a trial is being set up, in conjunction with the East Suffolk Catchment Partnership's/ERDF Project Topsoil, to undertake this monitoring. A sub-group has been convened to take this idea forward, which if successful could be rolled out more widely as, for example, an extension of the Felixstowe Peninsula concept of utilising drainage water, in place of building a holding reservoir.

The next stages of the MAR trial work will include the following:-

- Desktop study - modelling of aquifer capacity and available water storage volume
- Confirm the water source to be used
- Check water quality of this source and the need for treatment stages before entering the aquifer
- Establish a monitoring network (starting with establishing the location of and availability to use existing wells and boreholes)
- Design infiltration/re-charge system/s to be tested
- Obtain necessary licences and other consents
- Undertake trial to introduce water via various systems and monitor to investigate if aquifer levels/spring flows are improved and also test if it is possible to take water out of the system in the summer

As this concept is being seen as an alternative to using reservoirs for storage it will also be necessary to quantify any costs, including carbon balance, for comparison with a reservoir, before utilising it more widely.

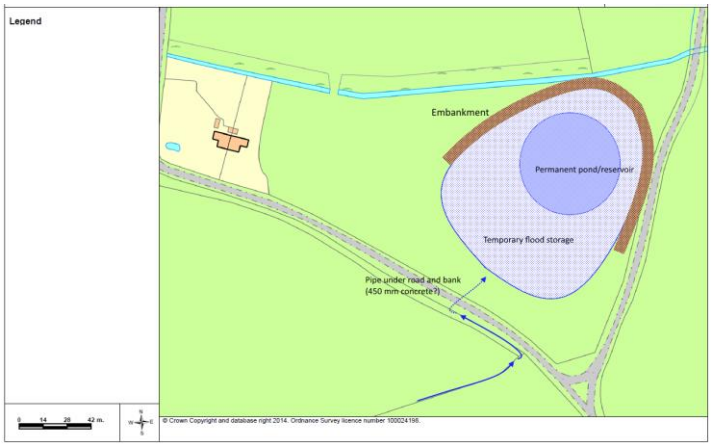
MANAGED AQUIFER RECHARGE SUB GROUP CONTACTS:
Paul Bradford, ESRT/HWMP consultant paul@bradfordbrighton.co.uk
Jane Barber, ESRT Project Topsoil Manager

3. Debenham Flood Risk Management Project:

The management of flood risk to Debenham is complex due to the three tributaries of the river Deben meeting in the village and the costs of many traditional flood management measures are prohibitive. Thus we are exploring a combination of several different ways to reduce risk, including slowing the rate at which flows enter the river network and getting the water away faster beyond the confluence of the tributaries.

(*Picture shows village flooded in 1993)*

Working with landowners and the Essex and Suffolk Rivers Trust, we identified a range of measures which could help reduce flooding in Debenham and also provide water quality and habitat benefits. These included Natural Flood Management (NFM) features (such as small flood storage areas and ponds). We incorporated the most promising 10 NFM features into a hydraulic model to assess their potential benefits and to ensure that they wouldn't have any adverse flood effects on other properties. The model showed that together, the NFM proposals could reduce flood risk in Debenham in smaller more frequent flood events, but that further measures would also be needed.



We are now engaged in detailed discussions with landowners to finalise the size and characteristics of the NFM features and management principles (*example design left)*. We will then be seeking consents for some of the features with a view to installing them later in the year.

The larger flood storage reservoirs we have modelled on the Gulls and Derry Brook do significantly reduce water levels in Debenham, however the construction and maintenance costs of these features are much greater than the benefits they provide. The funding provided by the Government is a fixed amount based on the benefits the project provides. As a result, significant funding from other sources (public and private) would be required to progress these features.

Investigations into creating a two stage channel to help improve the flow of water away from the village are also continuing. This too will require the support of landowners and a local site for disposing the excavated material, however the cost of this work is still likely to be greater than the benefits it provides. Other more conventional options for flood management, such as property level resilience, and improving the flood warning service in the village, are also being considered.

DEBENHAM SUB GROUP CONTACTS:

Will Todd, EA william.todd@environment-agency.gov.uk
Jane Burch, SCC jane.burch@suffolk.gov.uk

4. Water Framework Directive (WFD) and Channel Improvement Project:

WFD investigations show that the middle sections of the River Deben suffer from poor morphology, water quality problems and reduced fish populations. The river is also disconnected from its floodplain along most of its length.

Working with the Essex and Suffolk Rivers Trust/East Suffolk Catchment Partnership (ESCP) and sympathetic landowners, we have restored almost 1 km of back channels in water meadows alongside the river at Easton along with a silt trap to intercept road runoff. The back channels incorporate a simple dam and pipe structure which allows the landowner to hold onto flood water for longer (keeping the meadows wet and encouraging aquifer recharge) but also to drain the meadows if required. (*picture right).* Further upstream the ESCP has, with the help of the Wild Trout Trust, installed two 'large woody debris' structures to enhance the channel morphology within the river and provide refuges and nursery areas for juvenile fish.

The HWMP group is continuing to discuss potential river enhancement opportunities at Brandeston, Ufford and elsewhere. Landowners wishing to consider other opportunities should make contact with us.

SUB GROUP CONTACTS:
Will Akast, EA will.akast@environment-agency.gov.uk
Chris McArthur/Jane Herbert, ESRT chris@cimcarthur.co.uk

6. Abstraction Reform (licence trading) Project:

Following July's very successful "Water: Farming's Essential Ingredient" workshop organised by the East Suffolk Water Abstractors Group (ESWAG), a meeting was arranged on 19 August between representatives of the Environment Agency, Emma Howard Boyd (Chairman), Charlie Beardall (Area Manager)and Jonathan Thompson (Environment Planning Team Leader); ESWAG ,Tim Darby, James Foskett and Doug Inglis and Paul Hammett of the NFU. This meeting allowed some of the issues and challenges that came out of the workshop to be shared with the Environment Agency at the highest level, subjects such as abstraction reform, deterioration, trading and time limited licensing were discussed. An action out of this meeting is for Jonathan Thompson and Tim Darby to set up a meeting to further discuss possible areas of mutual interest on how more sustainable and secure water resources can be achieved in the Deben and East Suffolk area.

SUB GROUP CONTACT:
Jonathan Thompson, EA jonathan.thompson@environment-agency.gov.uk

6. Funding

The Holistic Water Management pilot is currently funded by 'ad hoc' and 'in kind' contributions from Suffolk County Council and the Environment Agency, with further 'in kind' contributions from Essex and Suffolk Rivers Trust (ESRT) and ERDF project Topsoil, the East Suffok IDB, and ESWAG. Significant additional funding will be required to carry out the detailed assessments required for a number of the projects, particularly the Felixstowe Peninsula proposals. Funding for the development of the Debenham Flood Management Project is coming from flood grant in aid and local flood levy but the project delivery will require additional funding.

SUB GROUP CONTACTS:

Matt Hullis, SCC matt.hullis@suffolk.gov.uk

Paul Bradford, Consultant paul@bradfordbrighton.co.uk