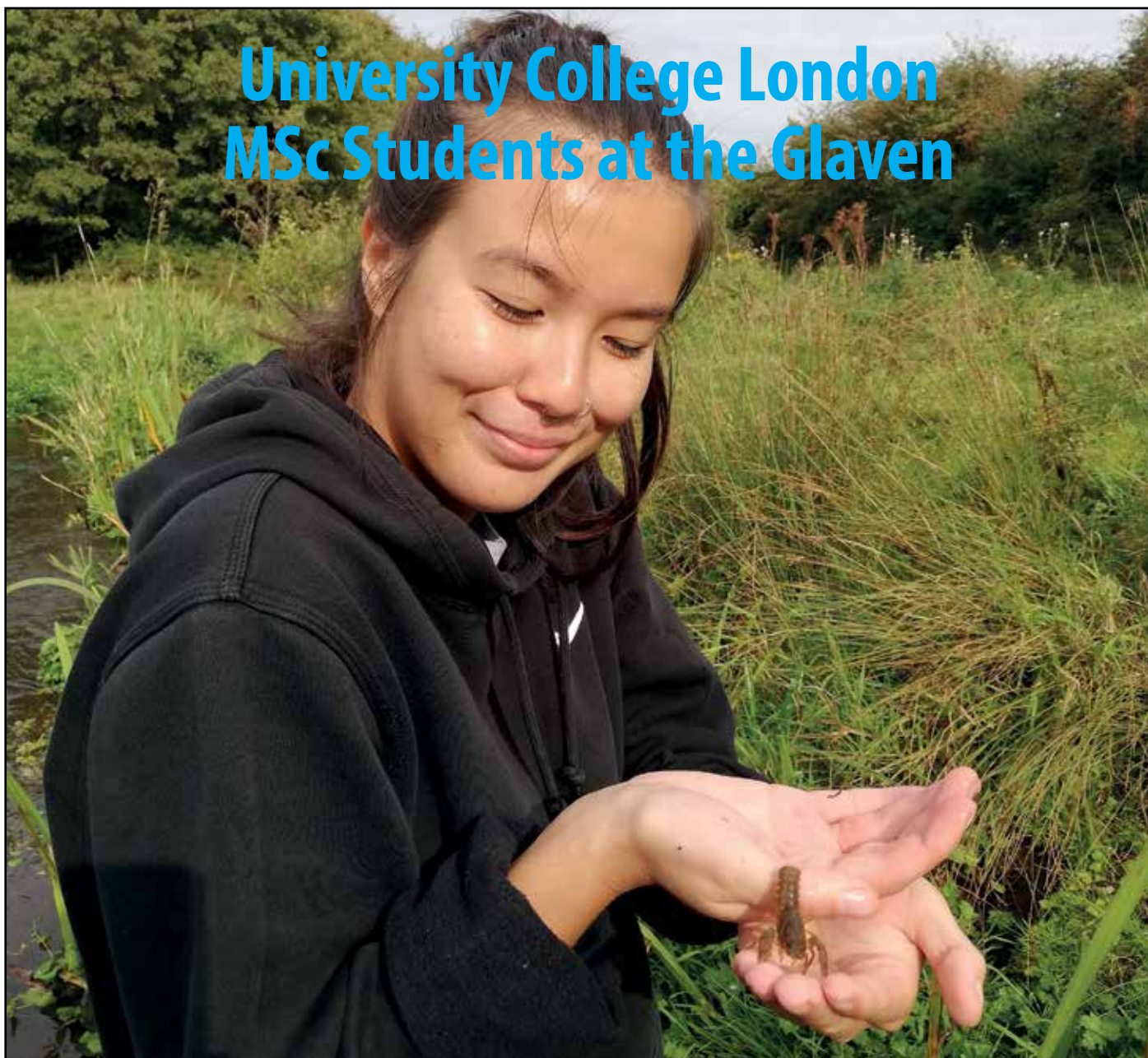




University College London MSc Students at the Glaven



On 30th September, with the kind permission of the Bayfield and the Letheringsett estates, Willie Brownlow and Natural Surroundings, and with much help from the Norfolk Rivers Trust and Adam Piper of ZSL, University College London MSc students (MScs in Aquatic Conservation, Ecology & Restoration & MSc in Conservation) had a survey day on the River Glaven. This is an annual fieldcourse event that pres-

ents an opportunity to make a check on a number of important Glaven species as the river is always sampled in the same way.

In the morning students looked at the Bayfield river restoration, Bayfield Lake and the fen and ditches at Natural Surroundings. To their complete delight, they were shown freshly captured eels (thanks to Jonah Tosney), pike, perch and all sorts of lovely plants of the river. Then, in the

afternoon, at Letheringsett Ford, the students were taught electric-fishing and crayfish survey techniques. It was pleasing to see the white-clawed crayfish still apparently thriving and also to see burrowing mayflies (which had been absent in 2018), bullhead, stone loach, brook lamprey and all sorts of invertebrates in good abundance. A great reminder of just how important it is for us to keep on conserving the

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The Knepp Wildland Project and the Landscapes Review

The Knepp Wildland Project is mentioned both in the 25-Year Environment Plan launched in January 2018 and the Landscapes Review on National Parks and Areas of Outstanding Natural Beauty (AONBs), the Panel making their final report on 21 September 2019. Both reflect the immense concern at the loss of wildlife, and the need now to think in terms of landscape and wildlife together, and not in different boxes. We can no longer take wildlife for granted, and stay fossilised at the 1950s situation. Isabella Tree's book on the Knepp Wildland Project was published in 2018 and created much interest and enthusiasm, and triggered a debate which continues. Was it a beacon of hope at last, a panacea almost to apply everywhere, or just not practical, or somewhere in between.

The Landscapes Review gives a succinct summary of the Knepp Wildland Project. "Knepp is a 3,500 acre estate in West Sussex. Since 2001, the land – previously intensively farmed – has been devoted to a pioneering rewilding restoration of the 350 acre Repton Park, in the middle of the estate, and widened a chance to look at the land in an entirely different way, and suggested the possibility of rolling out nature conservation across the whole estate.

Using grazing animals as the drivers of habitat creation, alongside the restoration of dynamic water courses, has resulted in extraordinary increases in wildlife. Rare species like turtle doves, nightingales, peregrine falcons and purple emperor butterflies are now breeding and populations of more common species are rocketing.

The vision of the Knepp Wildland Project is radically different to conventional nature conservation in that it is not driven by specific goals or species. Its driving principle is to establish a functioning ecosystem where nature is given as much freedom as possible. The aim is to show how a 'process-led' approach can be a highly effective, low-cost method of ecological restoration – suitable for failing or abandoned farmland – that can work to support established nature reserves and wildlife sites. Helping to provide the web-

bing that will one day connect them together on a landscape scale".

The Report goes on to say that "The Knepp Wildland Project is now a leading light in the conservation movement, supported since 2010 by Higher Level Stewardship funding it is an experiment that has produced astonishing wildlife successes in a relatively short space of time and offers solutions for some of our most pressing problems like soil restoration, flood mitigation, water and air purification, pollinating insects, and carbon sequestration." This is followed with an example of combatting climate change and the vital role of increasing tree cover as a carbon sink, but offering myriad other benefits like habitat connectivity, biodiversity improvement, help with preventing soil erosion, and reducing flood risk. We come back to these highlighted benefits with alternatives, and in the context of how widely can the philosophy be applied and what are the alternatives to achieve them?

The project has stimulated some sorely needed discussion, and undoubtedly there are many lessons to be learned, most likely in National Parks and other large areas in a sole ownership such as the National Trust in its wilder properties. However the Knepp is in a rather unique situation. This is a large land ownership, and the owners were in a position to disengage from intensive arable farming altogether and follow their philosophy; they would wipe out the losses they had in conventional farming, but the land value halves and not all would be able or willing to do. It relies on a variety of rare breeds or wild animals to provide ecological benefits, and much freedom to wander. In our view many of the environmental and wildlife benefits of Knepp can be obtained alongside conventional farming. This is demonstrated by Hole Farm Hempstead, with the support of the Farming and Wildlife Advisory Group. On connectivity it may be better than Knepp by the location at the headwaters between the Glaven and Bure. The habitats created will strengthen the ecological network; and see the proposal for a Nature Recovery Network below. There is an issue on food production and how much arable land can be set aside. The latest

Government population projections see a rise of 3 million in the next decade to hit 70 million in 2027-28. This is not just a huge impact on land use, but also water use and quality, not least with the increase in waste water that is treated in sewage treatment works and then discharged into our river systems.

In our view this combines to say that we must have a strategic approach for soil and water, and one that benefits both people and wildlife; the latter heading to extinction as collateral damage of what we have been doing over the past fifty years. Many elements for solutions are present, and the policies now on the table, albeit still in concept mode; but yet to be fully recognised, assembled and brought together in a coherent approach. Using our 20 years of experience in the RGCG we responded to the Landscape Review, supported by CPRE Norfolk on landscape and planning; and most crucially the Report looks for proposals for extensions to existing AONBs that should boost wildlife and support the recovery of natural habitats.

We proposed an enlargement of some 32 sq km of the Norfolk Coast AONB, with the added area having landscape worthy of an AONB, and crucially introducing major wildlife benefits through land management based on river catchments. This offers a strategy for a Nature Recovery Network by strengthening the ecological network provided by our chalk river systems, especially the links at their headwaters: Glaven and Bure, Stiffkey and Wensum; and the Bure and Wensum to the Broads. In doing this there would a connection between the north Norfolk Coast and to the east. This would embrace both the coastal and inland designated sites of nature conservation, and the wider countryside. A major part of the contribution to connectivity would come from improving the weakest part of the network, the upper reaches and headwaters of the rivers, likely to be dominated by intensive arable farming.

The Glaven and Stiffkey received a very big uplift in restoration projects through a successful bid to the Defra Catchment Restoration Fund which ran from 2012-15, they being the largest of nine chalk rivers on the north

coast. The most spectacular project was in the lower river at Bayfield. The river had been diverted into a brick underground tunnel in 1890-94. In August September 2014 a New River was created at a length of 1.2 km from 1 km in the tunnel. This was done by sculpting by design a sinuous channel with raised shallower sections topped with gravel, and this riffle followed by a deep pool on a bend; there were over 30 such patterns along the 1.2 km. Lowland rivers do not have the energy to shape the river naturally in this sinuous way, which is beneficial to the chalk stream ecology. There are other benefits to be obtained, most importantly a reduction of flood risk. The first major project on the Glaven in October 2006 was very early in a re-connection of the river with the meadow floodplain.

The Environmental Land Manage-

ment Scheme (ELMS) is still in the starting blocks, but the upper reaches of rivers must be a major target. The restoration of farmland ponds has been shown to not just boost wildlife on the site, but also connectivity, providing stepping stones through what might be otherwise an inhospitable habitat. We have also of course the existing hedgerows and trees, which could be increased. Most crucial perhaps is the reduction in arable run-off. Fields on valley slopes are high risk. High risk crops are potatoes and sugar beet in terms of soil erosion and pollution of the water system. This combination requires a change to grassland, scrub or trees. These measures can make a big contribution to reducing soil loss and river pollution with agrichemicals.

Ian Shepherd

We are grateful to all those members and other residents who refer to us on matters concerning the River Glaven. We aim to act as conduit for observations or concerns that might affect the health of the river.

Members have been active with ongoing monitoring and it was heartening to see that the river coped well with the recent downpours. The re-connections with the floodplains which were engineered as part of the restorative work on the Glaven in recent years, soaked up the floodwaters, distributed some of the silt into the meadows and reduced flood risk downstream. Fortunately the rains came before most beet fields had been harvested, and thus opened up to potential run-off.

Henry Crawley



(continued from p.1)

Glaven. We need to continue the fight for water quantity, water quality and ensure that signal crayfish do not invade the white-clawed crayfish-dominated Glaven middle reaches. The MSc students had a brilliant time and were treated to a barn owl hunting at Glandford Mill at the end of the day.

Dr Carl Sayer

We are fortunate to have a beautiful and wildlife-rich river; and with supportive landowners who permit access for an educational purpose.

The students range from those at school to post graduates. Holt Hall Field Studies Centre is very active with the first, and University College London with the second, under the guidance of Dr Carl Sayer. Carl as a youngster spent a great deal of time on the Glaven, which inspired him to make a career in aquatic science. These visits of young people are important to us all. We need to engage the young if we are to turn round around the dire situation where we are now one of the

most nature depleted countries in the world.

This a long term task, as set out in the 25-Year Environment Plan, but which many organisations have been involved in for many years. In the twenty years since the founding of the River Glaven Conservation Group we like to feel we have made a local contribution which reaches beyond our own river catchment; and will continue to do so.

Henry Crawley

Does The Glaven Need Its Beavers Back?

The beaver is a native Norfolk species, present here from the Ice Age until they were hunted to extinction at some time in the last four hundred years. In the same time period they almost disappeared from western Europe, hanging on in Scandinavia until the late 20th century, when they began to spread and re-colonise, thanks largely to deliberate re-introductions by humans. Although beavers are now well established in many countries, the UK has been very slow to bring them back, until recently. We now have populations living free in Scotland, Devon, Cornwall and Kent, and captive populations as close as North Essex. The reasons for their re-introductions have been diverse, ranging from flood defence, to reservoir protection, to habitat restoration.

The Good That Beavers Do

Wild and re-introduced beaver populations have now been extremely well studied, to the point where their ecological and hydrological impacts can be very well predicted. Beavers are ecosystem engineers, capable of re-building their environments to suit their own needs. They do this by creating ponds, wetlands and ditches which hold water and grow the aquatic plants on which the beavers feed. They are capable of doing this very quickly, and the ecological consequences can be dramatic. The flora and fauna that call the Glaven home have co-evolved with beavers, and many of them rely on beavers to create the habitat they need. Aquatic plants and the water voles that feed upon them both need areas of pond and river cleared of trees to allow the sunlight to reach the water surface. Without beavers, this only happens by human intervention. It is likely that the starwort and water crowfoot communities we see and value in chalk-streams like the Glaven only evolved there because beavers created sufficient open water. The plant growth and flow stability beavers create are ideal for water-voles too. When beavers fell trees to build lodges and dams they create ideal homes for native crayfish, lamprey and eels. The ponds behind the



Adult beaver, hull down.
Photo David Parkyn

dams have been shown to be ideal nursery habitat for fish, increasing fish abundance dramatically. Beavers also create flow diversity, restoring backwaters and wetlands to our landscape. This diversity of watery habitats allow dragonflies and amphibians to proliferate, as well as the marginal watery plants we have almost squeezed out of existence. Plant diversity, amphibian and insect abundance increase dramatically when beavers return.

Additionally, beavers address some of the biggest threats facing Norfolk's rivers. The dams lock-up sediment, preventing it travelling downstream and smothering spawning habitats. Slowing the flow and trapping silt also allows the river and newly created wetlands to process the nutrients that are killing our rivers. Research from Exeter University shows beaver dams decreasing the amount of sediment, phosphorus and nitrate passing down river dramatically.

Beavers also offer protection against flood and drought, storing huge amounts of water in the landscape, rather than rushing it off downstream. Our chalk-streams are not naturally prone to floods or droughts, and are threatened by both. Beavers restore their hydrological balance.

The trouble beavers cause

Beavers certainly can come into conflict with humans. They do cause localised flooding, they are capable of felling spectacular trees and they will steal crops within easy reach of the riverbank, particularly maize and sugar beet. However, all of these problems can be managed, as they are in Europe and increasingly in Scotland. Problem beavers can be trapped and removed, or beaver dams can be managed to prevent flood risk. Prize trees can be protected if necessary. Norfolk Rivers Trust believes that in order for beavers to be released freely in Norfolk we would need a management plan agreed with land-owners and government agencies guaranteeing that problem beavers would be removed and re-homed very quickly. The fact that beavers need wooded areas to build their homes means that agricultural conflict, although possible, should be minimal, as beavers will be attracted to the wet valley bottoms and alder carrs that are un-farmable. There is also concern that by re-wetting their surroundings beavers can actually damage key conservation sites, by drowning out species rich meadows and fens. Again, this can be monitored and managed, and beavers can be removed or their dams managed to prevent water-logging of key sites.

Why the Glaven?

The Glaven is currently suffering severely from all the problems which beavers address. The habitat through large stretches of the river has been damaged to the point where few fish (or voles, or crayfish) remain in the headwaters. By allowing beavers to re-create a series of dams, ponds and wetlands along the valley floor we could increase the ecological value of the upper catchment markedly, breathing life back into the river. Each pond becomes home to hosts of dragonflies and frogs, and alive with warblers, swallows and martins. The quality of habitat for eels and fish would improve enormously, allowing the river to support sustainable and



resilient populations.

The amount of silt and nutrients would decrease quickly and dramatically, protecting the lower river and old mill ponds from being choked, and allowing re-generation of trout and bullhead spawning gravels. The river would also suffer less from floods and droughts, as the beavers would store water, releasing it slowly through our increasingly long dry periods.

The Glaven undoubtedly needs beavers, and is well placed to host them. The catchment is relatively small, making beaver activity easy to monitor and, if necessary, manage. The Glaven also has a high proportion of wild patches of wet woodland and little agriculture right next to the river in comparison to other Norfolk rivers.

Norfolk Rivers Trust believes that the Glaven needs its beavers back in order to safeguard the amazing wildlife that we are lucky enough to enjoy for future generations.

What would it take?

Beavers don't need big lakes or rivers to thrive. They can construct the habitat they need very quickly from small streams or ponds, with a few trees present, as they have in Devon and Essex, where the streams they have been released on were barely a foot wide. They can eat most vegetation that grows on damp ground. On the Glaven they would thrive as high up as Gunthorpe, Melton Constable or Baconsthorpe.

In order for beavers to be released on the Glaven there would need to be broad agreement amongst land-owners, a management plan, and an organisation committed to future management. It would also need at least one land-owner to host the initial release. Norfolk Rivers Trust would be prepared to seek funding for a management plan and help with an application.

*Dr Jonah Tosney
Operations Manager
Norfolk Rivers Trust*

Upper: active beaver dam in arable chalk-land, Kent.

Middle: Beaver-felled tree, River Stour, Kent.

Lower: beaver feeding.
photo Cornwall Wildlife Trust

Norfolk FWAG Annual Award and Hole Farm Walk

The Norfolk Farming and Wildlife Advisory Group (FWAG) have been long respected for the work they do in supporting farmers with both information and practical advice in the county, and beyond as being affiliated to the national organisation. They also organise visits for farmers and to visit a host farm with some specific topic where the host will provide their knowledge and experience, and that leads to questions and an exchange of information and views.

On the 5th June there was a visit to Hole Farm Hempstead. This was more than a walk and talk event, but to celebrate the Norfolk annual Ian MacNicol Memorial Trophy 2018 awarded to Charles Inglis; and to father-in-law Robin Carver the national 2019 Silver Lapwing Trophy award, hosted by the previous winner at Castletown Farm in Cumbria, the judges having visited Hole Farm this year on the 22nd May. Charles talked about the farm as it was now and mentioned part of the history to set in perspective what was a most unpromising start when Robin and Rose Carver bought the farm in 1982.

This was something of a horror story, extreme even for its time, but could be taken as a warning for any future repetition. In the words of Robin: "In the sixties there was a revolution, which on arable farms led to a new breed of farmers who were ruthless in their prairie farming. David Johnson, who bought the farm in 1964, was an epitome of this new breed, taking over five farms in Norfolk, which he farmed for himself and others to whom he promised a 20% return on their investment. At Hole Farm all hedges and natural boundaries were destroyed with every hedge, gateway, wooden fences, wire fences all bulldozed into one vast heap which was set fire to and the remains (mostly wire) taken away or buried. This was followed by ploughing to the edge of every road, down every slope and even to the back door of the farmhouse". "Hole Farm ended up with five enclosures, which would have been fewer had Johnson been able to plough up the roads".

"Instantly and indeed consistently,



Upper: a typical FWAG walk, with a number of stops in the planned walk to see and discuss features of interest. So here is Charlie Inglis speaking and inner ring of people. Pioneer Robin Carver on right, father in law of Charlie. Jake Fiennes of Holkham in foreground, profile. Roger Combe of Bayfield centre back.

Lower: landscape view with Edgefield Little Wood SSSI on sky line, looking across a field of rape with wide margins.



Upper: the Suffolk Punch and woodland management.

Middle: A wide field margin with pollinator plants and wetland rush in centre.

Lower: Edgefield Little Wood, noted for White Admiral butterfly population.

there was heavy erosion (water and wind) – so great that a study group at UEA used to come every year to measure it (an annual loss of 150 cubic metres per hectare per year). An area of 80 acres to the north of the farmyard drained into the 'Hole' which led to muddy water coming through the farm buildings. Naturally the pond overflowed and formed a long erosion-created ditch down the valley to the south. Not one penny was spent on the buildings which deteriorated as a result and merely left to rot. The period of Johnson's ownership was a disaster for Hole Farm –and his investors. They never received the return promised and all of Johnson's five farms in Norfolk were sold off by him during his ownership – Hole Farm being the last".

Clearly this was an extreme case, but should be seen as the baseline against what we have now, as summarised by the FWAG citation. "Since 1982 an impressive programme of planting shelter belts, nine miles of hedgerows and farming practices aimed at sustainability, has turned the farm from an environmental and economic disaster into a profitable, thriving wildlife haven. The landscape has been transformed with 160 acres of wildlife rich, superbly managed woodland which includes black walnut and cricket bat willow plantations. A recognition that modern farming practices have impacted on wildlife has motivated the family to go the extra mile by digging ponds and scrapes, and providing top quality, innovative and diverse areas for farmland birds and pollinators. Species on the Red and Amber lists appear among the surveys of butterflies, bees, beetles, birds, dragonfly, arable plants and fungi that nature has rewarded the family's hard work and commitment to conservation".

This farm at 1982, pre-Knepp starting at 2001, has taken the more conventional approach in seeking to operate as a productive farm again, but in a combination with hedges and woodland that combat climate change by acting as a carbon sink; and in addition biodiversity improvement, preventing soil erosion and supporting habitat connectivity. By a fortunate chance the location lies in the area of Glaven and Bure headwaters; but then the importance of connectivity and the ecological network only arrived in 2006-8 with the Norfolk Wildlife Trust bringing it to the fore; and the wide recognition of the significance of farmland ponds as 'stepping stones' in 2016.

Henry Crawley

River Quality: the Need For Effective Waste Water Treatment

In 2018 only 14% of rivers met the minimum good status standards defined by the EU Water Directive, down from 25% in 2009. There is a long-standing and ongoing water pollution problem with agrichemicals contaminating both groundwater in aquifers and the surface water in rivers; the two sources for the public water supply in Norfolk. Much effort has been brought to bear on arable run-off to reduce the impact on our river systems, and more can be done through the judicious use of the Environmental Land Management Scheme. However there are also major issues around the effluent discharged into rivers from Waste Water Treatment Works (WWTWs), the waste being a combination of sewage and surface water run-off in a rain event. Councils such as NNDC in their Local Plans have to produce a Water Cycle Statement, and for this they rely heavily on the input from the Water Company and the Environment Agency.

In the previous round of this process questions were raised on the capacity of Holt and Fakenham WWTWs to be able to achieve compliance with the legal requirements; and now ten years on a general concern that insufficient has been done to upgrade incoming pipe network and plant capacity. We now face an unprecedented increase and Government drive on housing growth. Also in the last ten years there has been a greater awareness of the amount of micro-plastics and medicines received in the incoming foul water. Some water companies are much better than others, for example Anglian Water has a national lead in water metring and leakage prevention in the supply of water.

There is a concern nationally that the

legal constraints on WWTWs are too relaxed (for example that there is an allowance of one major non-compliance in a year, and raw sewerage can bypass the works); the quality of the effluent is monitored by the company and records are kept, but there is little resource to check and verify these; and the system is open to abuse, and this is only picked up when a company is set for many years in a deliberate approach of under-investment and/or abusing existing regulations. In the latter case there is an indication that this could be affected by ownership and degree of pressure on the profit margin, something not unique to water companies.

There was some stir in 2017 when Thames Water was fined £20.3 m in 2017, following a period of time when 4.2 billion litres of raw sewage was discharged into waterways connected to the main river. Now Southern Water has had extensive press coverage (for example Times 26/27 June 2019). Ofwat imposed a penalty package of £126 m. The management had set staff targets which would result in systematically concealing large leaks from failing WWTWs. It was found that senior management had colluded in a cover-up which spanned 2010 to 2017. In December 2016 Southern was fined £2m over leaks that had taken place in 2012. Also in December 2016 the company announced the departure of chief executive Matthew Wright who had been with the company since 2011. The largest shareholder in Southern is JP Morgan Asset Management at 40%. They had no comment for the press. The Financial Times suggested that the pressures originated from the owners, and senior managers were a conduit to the staff.

Matthew Wright on leaving Southern Water became the UK manager for Orsted Offshore Wind Energy. He expressed "genuine surprise" at the Ofwat decision. A financial conglomerate now own Orsted. Unlike Vattenfall owned by the Swedish Government, Orsted are to press ahead with both HVAC and HVDC onshore cabling options and transmission of power from Weybourne to the Norwich National Grid substation. Although HVDC is much less environmentally damaging, Orsted retain the option to select with price in mind just before construction is about to start.

Ian Shepherd

Crayfish monitoring

The native White Clawed Crayfish (WCC) population in the upper Glaven remains healthy but vulnerable. Work with the Norfolk Crayfish group and the Norfolk Rivers Trust continues by monitoring the crayfish populations in Norfolk, continued work on the Glaven to prevent Signal Crayfish getting into the upper river, and finding suitable 'Ark sites' as refuges. Two new developments are an aquarium based breeding programme which is being planned; and funding is being provided to survey for WCC with e-DNA sampling from local watercourses. Though expensive, it maybe more reliable and less time consuming than conventional surveying techniques.

Mink control

Six mink have been trapped on the Glaven this year, up from last year's tally so please let us know of any sightings (for more info search thenorfolk-minkproject.org.uk)

Henry Crawley

We aim to work in friendly collaboration with landowners and farmers, conservation organisations and relevant public bodies.

River Glaven Conservation Group

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