East Yorkshire Rivers Trust

EAST YORKSHIRE RIVERS TRUST Newsletter 9 - July 2015

DERWENT CATCHMENT PARTNERSHIP

Although the East Yorkshire Rivers Trust are hosts along with the Yorkshire Wildlife Trust for the Derwent catchment, we must rely on partnership working to deliver the many improvements that are needed in the catchment and even to prevent deterioration due to the many pressures on the environment. There are already some partnerships working within the catchment, such as the Waterways Partnership, Humberhead Levels Partnership and More for the Derwent Project, but a coordinated approach between these and other stakeholders was needed. Defra grants are made available for projects approved by catchment partnerships.

Several interested parties came together to form an interim steering group with the intention of forming a catchment partnership for the Derwent catchment. This group commissioned a consultant, Icarus, to help develop a vision, objectives and strategic framework for the development of a catchment and landscape scale partnership. The objective, through engagement and consultation, would place the Derwent on a national level footing for taking forward delivery and to draw down appropriate resources.

The consultants carried out a baseline survey to a broad network of stakeholders; established a Process Advisory Group who carried out two online surveys; held three participative, linked workshops with stakeholders (representing some 30 organisations and two landowners); conducted a wide-ranging review of existing, relevant partnerships, projects and initiatives across the catchment; and conducted research to establish organisational structures adopted by catchment partnerships elsewhere.

Their findings included: a review of the existing evidence base about the environmental status of the catchment and requirements for effectively monitoring progress towards achieving the vision for the catchment; an analysis of the options for an appropriate partnership structure, with implementation recommendations; an outline of the funding options for the Catchment Partnership, with recommendations about progressing its financial stability; a strategic framework for the Catchment Partnership and an outline implementation plan; a spreadsheet of the Catchment Partnership activity requirements identified in the workshops; and a summary spreadsheet of the findings of the research progessed into existing, relevant programmes, projects and initiatives and their relevance to the Catchment Partnership's vision and goals.

It is now up to the EYRT and interim steering group to implement these findings. This will be aided by an award to the EYRT from the Catchment Partnership Action Fund for this purpose.

YORKSHIRE DERWENT RESTORATION PROJECT – UPSTREAM PHASE – SEPH

Another project funded by the Catchment Partnership Action Fund is designed to improve the River Seph, a Rye tributary, where problems have been identified with inputs of sediments, with fish passage and with management of trees and woody debris. These issues were identified within a Wild Trout Trust report.

The project should provide best practice demonstration sites for large woody debris and erosion management, a fish passage easement at Low Mill and, in conjunction with Catchment Sensitive Farming, should provide a significant improvement in sediment pollution within this part of the catchment. The project will particularly seek to address excessive fine sedimentation. Likely sources include: stock poaching, arising from a lack of buffer strips and riparian fencing; stream crossings and road and track drainage; bank erosion relating to tree and large woody debris management; Invasive Non Native Species of plants (Himalayan balsam - largely controlled); and farm and equestrian yard run-off. Some of the sources of sediment identified may be eligible to be controlled by CSF grants, but others may not.

The project will undertake sympathetic management of large woody debris to help stabilise banks and reduce bank erosion whilst also creating important habitat and fish spawning areas. Where appropriate the project will cut back over hanging trees to reduce over shading. Demonstrate sympathetic management of riparian trees and large woody debris.

The project will identify causes of bank erosion and demonstrate sympathetic bank erosion repairs, including habitat improvement works.

Barriers to fish migration are a significant issue on the Derwent Management Catchment. This project will improve fish passage at a known location on the River Seph at Low Mill.

LOTTERY FUNDED
supported by Environment Agency

Howsham Bridge Project 2014

As part of the River Derwent Restoration Project the 'Restoration Plan' identifies several issues which contribute to the unfavourable status of the Yorkshire River Derwent SSSI. One of the issues identified along the full length of the river is to 'manage sediment input' and 'fence off trampled sections to allow to revegetate'. Along several sections of the river we have undertaken this relatively easy remedy, fencing off the stock from the river bank, to stop sediment entering the river. However at Howsham Bridge, which spans the Derwent, we found that fencing alone would not tackle the issue of silt pathways in the normal ways suggested in the restoration plan.

At this location, on the left bank, beef cattle grazed the banks of the river in two fields each side of bridge, wandering from each field at will by walking under the road bridge. This gave the cattle access to drinking water and allowed grazing in both fields without having to drive the cattle from one field to the other across a busy road, with all the safety issues that would arise. However although this method of grazing was beneficial to both the land owner and the tenant whose cattle grazed the fields, the access point under bridge had become a source of considerable material entering into the river.

To address these issues, an application was made to Sita's Enriching Nature fund for a project. The idea was to create hard standing for the cattle allowing them to move from field to field, but without continually disturbing open ground and therefore creating a silt pathway into the river. Sources of recycled concrete railway sleepers were found and a contractor sought who had the required skills to construct a 'water gate'. This involved reprofiling the river bank to ensure the access was safe (not too steep) for the cattle, excavating enough material to allow the sleepers to be inserted into the river bank to create the hard standing and installing fencing to form water gates that would withstand flood water. This gained the full support of the landowner and relevant permissions were sought and granted from both the Environment Agency and Natural England.

After considerable planning and preparation, the work to construct the water gates commenced on 4th November 2014. Due to the time of year and the fact that the area we were addressing is in a SSSI and has special interest for its grassland plants, the project team decided to hire specialist mats for the heavy plant machinery to traverse the land along the river bank in order to minimise damage. Although these mats added to the cost of this phase of the project, they have reduced construction damage and the costs of reinstatement. The look of the finished construction and minimised damage has gained glowing approval from the landowner for the management of the project so far. The construction phase was completed on 7th November 2014.

The East Yorkshire Rivers Trust would like to thank the Sita funders for their support with this project. The novel way this issue was approached and successfully addressed is a credit to all who participated in the project.

John Shannon
Derwent Restoration Project Officer

Before

After

Silt control projects undertaken at Lendales Farm, Kirby Misperton, North Yorkshire 2014

The Derwent Restoration Plan identifies silt as one of the main contributing factors leading to the unfavourable status of the Yorkshire Derwent in regards to its SSSI designation. Cattle poaching of the river banks is one of the main pathways by which silt enters the river and cattle in the river also allows direct entry of animal waste to the water body.

At Lendales Farm, four locations were found where cattle drank frequently from the tributaries of the River Derwent. At these locations, continual use by beef cattle had left open ground with no protective sward of grass and so allowed silt to enter the river freely. In warm weather the animals entered the water several times a day to drink, and in wet winter conditions, when the animals were not in the fields, rain and flood water carried silt directly into the receiving water course.

To address these issues, an application was made both to Sita's Enriching Nature fund and the local Catchment Sensitive Farming officer for a project. It was proposed that these drinking areas be made permanent and the areas of bare earth addressed in such a way as to ensure little silt entered the watercourse from these locations. This involved reprofiling the river bank to ensure the access was safe (not too steep) for the cattle, excavating enough material to allow the sleepers to be inserted into the river bank to create the hard standing and installing fencing to form water gates that would withstand flood water. Sources of recycled concrete railway sleepers were found and a contractor sought who had the required skills to construct a "water gate". Both applications were successful and the work was funded 50% from each funder. The relevant permission was sought from and granted by the Environment Agency. Local searches for all utilities were undertaken and discussions were entered into with the landowner to ensure all Health and Safety issues were addressed.

Work on installing the four drinking points commenced on the 7th of October with two water gates directly opposite one another being created on Pickering Beck where the cattle crossed the beck itself (see photographs right). Water gates were also installed on one bank of the Costa Beck and one bank of the Twelve Foot Cut. The work was completed within five working days.

ELMSWELL BECK

In winter 2014 through to early spring 2015 work was carried out at one of the headwater streams known as Elmswell Beck. Initial discussions had been had with the landowner in the previous year, looking at how work being undertaken through his agri-environment Higher Level Stewardship (HLS) scheme, administered by Natural England, could be implemented along an over-wide, weed choked section of the channel.

The channel in question forms one of the first feeder streams emanating directly from springs rising at the Springwell farm site. Over time the channel has become over-wide and when flows subside as the springs drop a very shallow water depth occurs with subsequent increased aquatic weed growth. By late summer/early autumn the stream is largely dominated by extensive beds of Fool's watercress with pooled water and minimal biodiversity.

A plan was devised to create a high and low flow channel, retaining the original wide cross section, whilst creating a deeper central channel to hold a greater depth of water in times of low flows. The central channel would meander through the wide cross section, to increase stream bed variability. Green engineered solutions would be used with large woody debris and coir logs installed at appropriate locations.

Once completed a sinuous central channel would naturalise with a wide original channel holding high flows as before, but critically the low flow water would be held in the newly created central channel, providing greater water depth for a longer period. This will increase habitat availability for a wide range of species including fish, invertebrates and birds as well as increasing aquatic and marginal plant diversity.

This work is a good example of a partnership approach with thanks to Natural England, Environment Agency, Yorkshire Wildlife Trust and Mr John Fenton (the land and riparian owner) who all assisted and made the work shown above possible.

Wide weed covered channel u/s view – autumn 2014

Stream restoration works autumn 2014

Volunteers assisting with works – coir logs installed on outside of 'new' meander

Creating new sinuous low flow central channel

Right:** **Compare with before. High flow channel still functioning with low flow channel visible (clean gravels)

PICKERING BECK REHABILITATION

The Pickering Beck project has received funding from the Cemex Environmental Trust. The project aims to create self-sustaining populations of brown trout, grayling and river lamprey within the Pickering Beck and to improve habitat for the nationally rare Duke of Burgundy Butterfly.

This work is part of an ongoing project being run by the East Yorkshire Rivers Trust (EYRT) in partnership with the Pickering Fishery Association and the Duchy of Lancaster Estate - the land owners.

Siltation, over-shading trees and lack of woody debris in the river have all had a negative impact on fish habitat and spawning areas.

Action taken

1. The tree canopy has been reduced to allow sunlight to reach the stream and the forest floor. This will promote the growth of plant species that will increase the biodiversity of the forest.

2. The glades that have been created will provide natural flight paths for the rare Duke of Burgundy Butterfly and suitable habitat for the growth of cowslips and primroses, their primary food source.

3. The project will fell some trees to reduce over-shading of the Beck and create woodland glades. The larger felled timber will be used to stabilise banks and block silt pathways. Large woody debris will be introduced into the Beck to provide habitat for invertebrates and fish.

To minimise damage to the forest floor a 'horse logger' was used to move the large felled timber within the project site.

WATER FRIENDLY FARMING

Water Friendly Farming can help protect our rivers and streams, and can help make farm businesses more effective and efficient. Good land management and farm practice will improve soil protection, reduce fertiliser and pesticide use and can also improve animal health. This can result in both cost savings and environmental improvements.

Livestock and Rivers

Where stock have free access to the river, water quality can be poor.

Poached soil leads to erosion, over-wide channels and shallow watercourses. This is compounded by compaction of soil, in turn leading to greater runoff and the deposition of fine silt on the riverbed. Silt robs the riverbed of oxygen by blocking the spaces between the gravels, significantly reducing the number of invertebrates and fish eggs. Uncontrolled stock access also adds animal wastes to the rivers which causes pollution.

Fencing watercourses can help reverse this decline

- River bank vegetation is re-established, helping to reduce erosion.
- Establishes a buffer strip between rivers and fields that intercepts soil run off.
- Reducing soil run-off helps to keep important nutrients on the land, often reducing the need for and cost of using fertiliser.
- Keeping livestock out of rivers may help reduce the spread of waterborne disease.
- Failing to address soil erosion or complete a 'Soil Protection Review' can affect single farm payments.
- Allowing polluting material to enter a river or stream is also an offence which can attract large fines.

Fencing and Stock Watering Good Practice

- Set fencing at an appropriate distance from the river (banktop height or greater).
- Align fencing parallel to flow and build in weak points at areas of risk.
- Temporary electric fencing or three lines of wire may be more appropriate than stock netting in areas of high flood risk.
- Make provision for gated access, to allow control of invasive vegetation by topping or occasional grazing by livestock.
- Access ramps should be sited on slope no more than 1:6 and should be surfaced with local stone held in place at the toe of the bank with untreated timber or similar.
- Locate water troughs away from watercourses.
- Provide hard base around the trough to minimise poaching.
- Troughs should be used in preference to drinking bays.

Issues

1. Poorly maintained yard and buildings – no rainwater goods, uncovered stock gathering areas resulting in clean and dirty water mixing.
2. Silage clamp located next to ditch increases potential for leachate to drain to river.
3. Poorly maintained farm/cattle tracks and gateways encourage runoff to ditches and river.
4. Neglected, over-mature riverbank trees – heavy shade suppresses vegetation and encourages erosion.
5. Poorly sited livestock feeder – poached and prone to runoff to river.
6. Uncontrolled stock access resulting in trampled and eroded riverbanks.
7. Arable field on steep slope – no buffer between field and river, no in-field grass or shrub buffer to help intercept runoff.
8. Collapsed willow - identify willows at risk and pollard.

Solutions

1. Well maintained yard and buildings – rainwater storage and covered stock gathering areas.
2. Covered slurry store located away from watercourse.
3. Well maintained tracks – limited pathway to river.
4. Phased management of river corridor – vegetated riverbank to help intercept runoff – recently coppiced and pollarded trees retaining proportion of mature and veteran trees to create a mosaic of light and shade.
5. Livestock feeder located on hard-standing and away from river.
6. Fenced river to prevent stock access encourages vegetated buffer strip.
7. Livestock watering – either drinking bay or trough on hard-standing.
8. Fenced ditch – well vegetated banks help intercept runoff.
9. Beneficial in-stream woody debris – located to limit erosion.
10. Gateway located away from river.
11. Arable field located away from river with grass margins to intercept runoff.
12. Pollarded willows.

Invasive Species

Non-native invasive species such as Japanese Knotweed, Himalayan Balsaam and Giant Hogweed can out-compete native plant species reducing the biodiversity of the river banks.
When they die back in winter they leave bare ground that leads to erosion and increases sediment input into the rivers. Giant Hogweed can also cause nasty skin blisters.

Whilst Himalayan Balsaam might provide some nectar for bees the reduction in natural biodiversity has larger negative impact upon all native wildlife, including bees.

Your help is needed
If you spot Giant Hogweed, Japanese Knotweed, or Himalyan Balsaam within the Derwent Catchment please report it via the plant tracker website:
http://planttracker.naturelocator.org

Ditch Management

Ditches often form a direct route between the farmyard and the river and can be a path by which fertilisers or chemicals enter a river. Ditches can act as a buffer to filter silt and pollutants before they reach the river. Frequent clearing can disturb this filter.

Good Practice

- To reduce the need for frequent dredging, fence ditches to prevent bank erosion. Bank side vegetation will help intercept run-off.
- At field corners consider creating small ponds or filter beds to encourage settlement of silt.
- Phase dredging operations over several years rather than clearing the entire length.
- Avoid spreading fertiliser and pesticides near to ditches.

Large Woody Debris

Large woody debris - the branches and root boles that collect in a watercourse are often removed because they are unsightly or thought to cause erosion and flooding.

Whilst this is sometimes true, large woody debris is in fact a valuable asset to the river and can if managed correctly help to reduce erosion and benefit wildlife.

- It can be difficult and costly to remove woody debris from the river. Instead, if it is pinned to the bank it will help to reduce erosion - stabilising riverbanks.
- Creates diverse flow conditions that can improve water quality and encourage natural flows that enable the river to self clean.
- It creates niche habitats and cover valuable to fish.
- Woody debris provides valuable nesting sites for Otter, Grey Wagtail and Dipper.

Controlling Runoff at Source

Clean and Dirty Water Separation

- Ensure guttering, downspouts and underground pipe work are in good order – consider storage of this clean water as an alternative to more expensive sources.
- Ensure that rainwater from rooftops is kept away from stock gathering areas, trackways and manure stores.
- Consider roofing stock gathering areas to minimise the production of dirty water.

Livestock and Vehicle Movement

- Minimise poaching through the provision of 'cow tracks'.
- Site feeders on hard-standing areas on higher ground away from watercourses and move regularly to avoid poaching.
- Identify erosion pinch points to reduce poaching – install cross drains in tracks, move or resurface erosion prone gateways, resurface farm tracks, install watercourse crossings.

Managing Soils

- Implement soil, crop and nutrient plans for the farm – identifying areas of erosion and runoff risk will help safeguard the most valuable resource on the farm.
- Consider regular soil nutrient testing to help reduce fertiliser costs.
- Capping and compaction encourage rapid runoff - check soils regularly.
- Avoid cultivation when soil is too moist.
- Avoid vehicle movements/wheel ruts on wet soil.
- Utilise a cropping sequence to ensure ground coverage throughout the year.
- Where erosion is severe consider alternative uses for the land.
- Consider permanent vegetation (hedges, woodland, grass buffers) on steep slopes, natural drainage-ways at risk from gully erosion, long unbroken slopes, wet soils in difficult corners and alongside watercourses.

Controlling Riverbank Erosion

Riverbank erosion is largely a natural process. However in recent times erosion has accelerated through the loss of riverbank alder (diseased and over-mature) and uncontrolled stock access.

Eliminating the cause of erosion is essential before embarking on riverbank protection works. Where erosion is sustained it may be necessary to consider revetment.

Revetment – Good Practice

- Environment Agency consent may be required before working within or near the watercourse.
- Use soft revetment e.g. willow spiling, brash, coir matting, pinned conifer tops.
- Hard revetment should be avoided.
- Revetment should follow the natural line of the river.
- Opportunity to incorporate wildlife features e.g. pipes buried into banks to encouage Water Voles.

Good Practice Guide

COLLABORATION - RIVER HULL HEADWATERS SSSI RESTORATION

Eastburn Beck - 2014 Phase 2

Background

Following a survey of the river channel on the first phase in September 2013 several cross sections were taken to determine the channel capacity. Large areas of silt deposition and gravel compaction were recorded. This first section of the stream was very over-shaded with mature willow and hawthorn. Some pollarding and crown reduction was undertaken. However, it is planned to reduce this over-shaded habitat further and use the material within the phase 2 site.

The aim of the project is to create areas of flow diversity and scour by the introduction of large woody debris. This method of silt control has been used in many areas and is accepted by most conservation bodies as a sustainable way of establishing a natural 'self-cleaning' flow characteristic within the channel.

The gravel bed will be loosened and any material gained will be used to enhance the narrowed meandering low flow channel. The undercut banks on each side of this section will be protected by green-engineering methods applied to the toe of the bank.

This 700 metre section is largely devoid of any bank-side tree cover. With the owner's consent it is proposed to plant species endemic to the area such as hawthorn and low-forming willow.

Upstream pointing 'V'. This structure has been used on a featureless section with even bed and water depth. The 'V' will create scour in the centre channel. The material displaced will form a gravel riffle with naturally sorted gravel sizes that will benefit trout spawning and invertebrate habitat

Planning

This phase 2 site will be accessed through JSR land on the right bank. In contrast to phase 1 this 700 metre section is largely devoid of tree cover. The exception being a few multi-stemmed hawthorn and small willows present on the lower section.

Material for creating the new margins will be gained from crown reduction of large willows along the phase 1 section.

This material will be pinned into the stream channel using the usual 2000 x 16mm rebar pins.

Tree 'kickers' were made from the hawthorn and willow by hinging into the river and securing with stakes.

This project was undertaken close to trout spawning time and during the work, several large fish could be seen fighting for the best positions.

Future phases are proposed on this stream with projects featuring meanders on the Southburn Beck and extentions to work already undertaken on Eastburn Beck.

View looking at the top of the site showing erosion to the left bank

Willow spiling used to protect the toe of the eroded bank. The small island has been retained to maintain the narrow channel and both banks have been protected from increased erosion

Bank toe protection using coir rolls. The rolls are staked and backfilled to promote natural plant growth from seeds present in the river sediment

Picture above showing a cover log. These are made from large diameter logs cut in half and fixed to the stream bed on spacers (legs) that create a gap beneath the log

West Beck, Bell Mills to Junction Pool - 2014

Background

This section of the West Beck is over wide and of a straight plan form with very little in stream habitat or cover for fish.

The channel lacks any energy in flow patterns which naturally help to maintain a self-cleaning river.

This lack of flow diversity during low flows periods increases the silt deposition on the river bed causing smothering of gravels and affects the diversity of invertebrate numbers important to anglers.

The aim of this project is to create a narrow 'low flow channel' while at the same time maintaining the overall cross section of the river alleviating any additional flood risk to the Mill.

This will be achieved by installing marginal 'berms' to narrow the channel. These berms will be backfilled with bed material from the mid channel.

This over-deepened channel will be created in a meandering form between the new bank installations. This will energise the flow of the river during both high and low flows.

The river will, during high flows, create additional scour pools and will wash out fine sediment in a natural process.

At low flows the river will drop into the narrowed channel and, with the energised flow will keep this channel free from any siltation.

During the very high water some years ago many trees were lost as they were inundated for several weeks.

It was agreed that as part of this project that the riverside trees would be replaced.

The species would be all indigenous to the area such as alder, hawthorn and blackthorn.

Planning

Following several site meetings with the riparian owners, Stuart & Simon Bradshaw, we agreed the extent of the works, appointed contractors and the project started on the 24th November.

Several willow trees near the site that had began to fall over were felled and placed on site to be used for the margin creation.

A problem that was quickly identified was the very sluggish flow due to ponding caused by the massive weed growth along

the river downstream of the project site.

The water depth through the site varied between 0.8 to 1.5 metres. The flow was measured at less than 0.1 m/s.

The original plans for this site were modified slightly by using willow logs to create the margins and large willow brash to act as 'kickers' to divert the flow.

Dead hawthorn was used to make large shelter areas, reducing the channel width locally by 40%.

Larger logs were pinned to the channel bed to act as deflectors.

Points to discuss regarding this section of the West Beck include:

- Operating of the sluices that are built within and upstream of the mill.
- The mill owners control the division of the flow around this structure.
- At present, the priority is given to the natural river course. Only at high flows is water diverted down the mill leat (project site). This, along with lack of weed management, has resulted in very high silt deposition on the lower section of the mill leat.

If constrictions were managed downstream, this 180 metre project site would benefit from the resulting increase in flow and natural movement of the sediment.

Backfilling of new 'D' shaped submerged berm

Placing a large log close to the left bank as a deflector. A total of nine such structures were positioned through the project site. These logs were drilled and pinned to prevent any movement

Below: View of lower section of the project site looking towards junction pool. Hawthorn bushes on the left and right banks were dead or dying. The bushes on the right bank were felled and placed under the bushes on the opposite bank and secured using steel pins

AMI RIVERFLY SAMPLING 2013 AND 2014

AMI Riverfly sampling was carried out at a number of sites on the River Hull/ Driffield Beck and the Derwent catchments. This involved three minutes of kicking the riverbed whilst holding a 1mm mesh net downstream to capture any dislodged invertebrates. My observations are as follows:

Driffield Beck (Two sites on Mulberry Whin Fishery and two sites on the West Beck Preservation Society water)
This is a chalk stream fed from springs just a few miles upstream from the sample sites. Water temperatures do not fluctuate widely and the water is lime rich and alkaline. The bottom is a mixture of small chalk gravel and silt. Most years there is a good growth of Ranunculus weed. Maximum flows are usually in the early spring when the chalk aquifers have been replenished by autumn and winter rains.

In 2013 no sampling was possible early in the year due to very high water levels. Throughout the summer there were good numbers of cased caddis (from 30 up to 1000 per three minute kick sample), mainly tiny Agapetus. Baetis nymph numbers were high (200 to 3000). Small numbers of Serratellaignita (Blue-winged Olive) nymphs were seen and decent numbers of Gammarus (typically 300 to 2000). However, water levels dropped sharply and by December they were the lowest I've seen in 30 years. Invertebrate numbers also declined markedly.

By February 2014 water levels had recovered but by April they were dropping despite extensive weed growth. High summer Baetis nymph numbers (up to 2500 per sample) were not reflected in good hatches of sub-imagos (at least not during daylight). Serratella nymph numbers were higher than in 2013 (up to 300 per sample) but again few were seen emerging. Once again Agapetus cased caddis larvae were abundant as were Gammarus.

Driffield Beck seems to have been going through a 'boom and bust' cycle over recent years with wildly fluctuating water levels, weed growth, siltation and invertebrate numbers, undoubtedly a reflection of our fluctuating climate and abstraction from the aquifers.

An interesting find in one of the December 2014 samples was a Heptageneid nymph, the first I've seen in the beck in over 10 years of sampling. Also of interest is the discovery in 2014 of isolated Gammarus tigrinus amongst the usual Gammarus pulex. This non-native species, from the USA and Canada, first seen in the UK in 1931, is reputed to have the potential for significant harmful impact on other invertebrates.

Yorkshire Derwent (Two sites near Hackness, Scarborough)
This is a moorland fed spate stream with acidic source water but some input from alkaline limestone springs. Weed growth is very limited but there is some Ranunculus at the lower site (Wrench Green), whilst the upper site (Langdale End) has no weed growth.

Invertebrate species diversity is much greater than Driffield Beck with all eight identifier groups being represented (Cased Caddis, Caseless Caddis, Mayfly (Ephemera danica), Blue-winged Olive (Serratellaignita), Heptageneidae, Olives (Baetidae), Stoneflies and Gammarus (Shrimps). However, the overall numbers of invertebrates are much lower than the more productive Driffield Beck.

In both 2013 and 2014 Baetis nymphs and Heptageneid nymphs were the most abundant invertebrates with samples containing into the low hundreds. Stonefly nymphs were abundant in the upper site (Langdale End), as were Paraleptophlebia submarginata nymphs (Turkey Browns) (not included in the eight identifier groups). Gammarus were present in all samples in low numbers (10s). During the summer months low numbers of Serratella nymphs were seen in some samples. Mayfly nymphs (Ephemera danica), Caddis larvae (both cased and uncased) were infrequently found.

The Langdale End site samples often contained our native White Clawed Crayfish.

Scalby Beck, near Scarborough (Two sites)
This short stream suffers from considerable fluctuation in flows as it receives flood water overflow from the upper Derwent via the Sea Cut channel about three miles below Hackness.

Samples showed lower species diversity and numbers than the other streams due to the great fluctuations in water levels that occur in this small stream with it limited catchment area.

Pickering Beck (Two sites, one two miles above Pickering town on the Dutchy Water and the other just below Ings Bridge downstream of Pickering)
Like the upper Derwent this is a moorland fed stream with some influence from limestone springs. Weed growth is non-existent at the upper site other than a small amount of Fontinalis moss but there is some Ranunculus adjacent to the lower site at Ings Bridge.

This stream has the best species diversity and some of the highest invertebrate populations of all the Derwent Catchment waters sampled, particularly at the site above the town where some of the larger species of Stonefly are to be found (Dinocrascephalotes and Perlodesmicrocephala).

Oxfolds/Costa Beck (Five sites in the two miles below its source at Pickering - top site above the top trout farm, two sites between the top trout farm and the lower trout farm, one site just below the lower trout farm and the lowest site just below the Yorkshire Water sewage outfall)
This is a spring-fed limestone stream with stable flows and water temperature. Weed growth is extensive with a variety of species including Ranunculus and Starwort. Sadly ten years ago it underwent a catastrophic decline as a fishery and despite much work by the East Yorkshire Rivers Trust, Fish Legal/ Angling Trust, Environment Agency and Pickering Fishery Association the problems have yet to be resolved.

2013 and 2014 invertebrate numbers have shown the same pattern that has been evident since sampling started in 2008. As with Driffield Beck (which is ecologically similar) Mayfly (E. danica) and Heptageneid nymphs are absent but unlike Driffield Beck Stonefly nymphs (Plecoptera) are present (but only at the top site). Baetis and Serratellanymphs are well represented at all sites. The obvious anomaly is the lack of Gammarus at the sites below the trout farms, although their numbers recover significantly at the lowest site, just below the Sewage Outfall.

River Rye, Nunnington (one site)
This is a rich river with abundant Ranunculus and limestone influence. It has the greatest invertebrate populations with all groups well represented with the exception of Gammarus that has never re-established to any extent since most invertebrates were wiped out during 2001 when the area was under Foot and Mouth restrictions with disinfectant spread over many roads near to watercourses.

River Seven, Sinnington (Four sites sampled four times a year)
This is a moorland stream with very little limestone influence.

All the eight indicator groups were represented although Ephemera danica, Serratellaignita, Caddis and Gammarus were only present in low numbers.

River Dove, just below Kirkby Moor Side (One site sampled infrequently)
This is a very overgrown stream with moorland origin and quite silty in many areas around the sample site.

All 8 indicator groups are present at this site with only Baetis nymphs being abundant.

Most of the sites sampled show healthy habitats. However, water level fluctuations on Driffield Beck are of concern as is the health of Oxfolds/Costa Beck, where Gammarus are struggling in some areas and the wild trout and grayling populations have crashed catastrophically.
Dave Southall

Dinocrascephalotes

Gammarustigrinus

IN SEARCH OF SYNAGAPETUS DUBITANS

A first for discovering a micro-caddis not previously recorded in the UK happened to Stuart Crofts (Riverfly Partnership) in 2010. A casual sweep of a hand net through plants on the bank of a spring fed stream revealed one adult Synagapetus dubitans, a very small caddis thought to be found only in Europe and not in the UK. Later the identification of the insect was confirmed, and in 2011 was discovered at several other sites in North Yorkshire. Later, in 2012, during work by the EYRT at Bracey Bridge plantation, the discovery was raised by Alan Mullinger and Jon Traill when stood beside a powerful spring pool feeding a stream at Bracey Bridge plantation near Driffield.

At least one other site was known to seemingly match the conditions required for this caddis but for the time being it was (eventually) decided to 'test the water' by sampling the plantation spring(s) pool on the 13th May 2015. On arrival three springs were seen to be breaking the surface of the pool (still active after a long dry winter and Spring), with a forth hidden on the edge of the pool beneath overhanging vegetation. The most powerful spring was spilling out a fair amount of water which flowed over a bed of small woody bits giving way to a silt bed. Not ideal for caddis, but some reasonable substantial pieces of decaying timber in the pool yielded three or four different caddis species... in small numbers! The cases of the small caddis measured similar to the figures given in Stuart's paper so I e-mailed him the same day and the next day samples of all caddis found on the site was posted to him for identification.

Unfortunately, hope didn't spring eternal this time... the micro-caddis was identified as Agapetus fuscipes, a common species, and the others as Silo pallipes and two Limnephilidae species. However, the pool and bankside vegetation will continue to be checked for caddis this Summer and perhaps the elusive Synagapetus dubitans will make an appearance and can be claimed as a first for East Yorkshire.
Dave Croft

WATER SHREW (NEOMYS FODIENS)

The largest of Britain's shrews, with long pointed snout, small ears and tiny eyes. Fur is short, dense, velvety and jet black on the upper surface of the body, usually greyish white/yellowish underneath. Most have a tuft of white hairs on ears and white hairs around the eyes.

Distinctive stiff white hairs on the margins of the feet, and underside of the tail forming a keel.

Size: 67-96mm, tail 45-77mm.

Weight: 12-18g.

Life Span: Short lives lasting no more than about 19 months.

The water shrew is found throughout mainland Britain. It is semi-aquatic and is most often found in habitats close to water, including the banks of streams, rivers, ponds, drainage ditches, reed-beds and fens. It is particularly numerous at water-cress beds. Occasionally it is found far from water in rough grasslands, scrub, woodlands and hedgerows, usually as the young are dispersing. They have low populations densities compared with most small mammals.

Water shrews are generally solitary, each maintaining its own territory, although they frequently live in close proximity to each other in a favoured area of stream-bank. They breed throughout the summer, producing two to three litters, each with 3-15 young, between April and September. Females produce their young in a nest woven from dry grass, usually in a burrow or under a log. After breeding the adults die-off and the young shrews carry the population through the winter before becoming sexually mature the following spring, ready to breed in the summer following their birth.

General Ecology

Water shrews inhabit burrows and come out to feed on invertebrates. The water shrew is most unusual amongst mammals in possessing venomous saliva. A mild toxin secreted into the saliva in the mouth helps to stun the prey. Even humans can feel the effects of this if bitten by a water shrew. Even though the shrew's bite rarely punctures the skin, a red rash appears at the site of the bite which is sore to touch. They do not hibernate; they remain active all through the year, diving for aquatic prey even in mid-winter. The fur is denser than in other shrews, efficiently insulating them against cold and wet.

Their main food source is freshwater shrimps, water skaters and caddis larvae which they obtain by diving and hunting underwater. Occasionally frogs, newts and

small fish are eaten. They also feed on many terrestrial invertebrates such as earthworms, snails and beetles.

Because water shrews are never very abundant, it is difficult to tell if their populations are under threat. They are still numerous in many sites where long-term studies have been conducted. The likely reasons for any decline in their numbers are habitat loss and water pollution. While they can tolerate a good deal of disturbance from human activities, drainage schemes and river-bank clearance may adversely affect them by altering the water supply, reducing their food supplies, destroying their burrows and the vegetation cover. They are very vulnerable to pollutants and pesticides in the water which they ingest indirectly via their prey and directly through their grooming activities.

THE SNIPE - A DECLINING WADING BIRD

Over the last 100 years many wetland areas have been lost through changes to land management, industrial and housing development and direct drainage for land reclamation. As this happens, many river systems become disconnected and the river channel is squeezed into an ever tighter corridor, effectively losing its floodplain.

The value of floodplains has long been understood and one group of birds rely more heavily on them than many others. Wading birds, by their very name, need areas of marsh, fen and open water to feed, roost and breed. Today there are fewer lowland wetland sites able to support breeding waders with many now restricted to upland sites or breeding in continental Europe and only returning to the UK for the winter months.

One species that you may encounter in areas of tussocky wet grassland or rush pasture is the snipe (Gallinago gallinago). The first encounter is often as you pass through a wet area of a field, only to be surprised as a small brown bird with long bill rockets out of long vegetation in front of you, alarm calling as it flies off. Birds do breed in lowland areas of the UK, but this is becoming rarer, with many sites now only home to over-wintering birds. If you are lucky enough to have breeding snipe you may witness the amazing courtship display flights of male birds as they dive up and down at dusk. The flight is accompanied by a distinctive 'drumming' call which is actually made by air passing and vibrating through the outer tail feathers.

It feeds on worms and molluscs in shallow water or the muddy margins of a wetland area and needs thick vegetation to hide from predators. The nest is also found in these denser areas of rush, sedge or tussocky grass with up to four eggs incubated by the female for around three weeks. Young are active immediately and are led to damp areas to feed on insects and small worms. They grow quickly and are able to fly after two weeks.

The Snipe - a bird now on the Amber List due to declining numbers