

East Yorkshire Chalk Rivers Trust

Aike Fry Refuges

Aike Beck, a tidal tributary of the River Hull, was diverted in the 1980's and the channel course returned to arable land.

In compensation for this loss of habitat, several channels were excavated in the berm of the main river to create sheltered areas for fry. After 20 years, these off-river channels had become silted. A project was set up in partnership with the East Riding Fisheries Consultative Association to reinstate this important habitat.

On site supervision of the work was undertaken by the Trust. The channels were reshaped and deepened to improve the habitat.

The effectiveness of the shelter channels will be monitored in partnership with the Environment Agency.



Eske Borrow Pit

The banks of this 30 hectare flood storage lake next to the River Hull near Beverley was becoming badly eroded due to the open aspect and the prevailing wind. This site is adjacent to the Pulfin Bog, a SSSI and important bird migration route.

The Trust entered into a partnership arrangement with the Environment Agency

and Bishop Burton Agricultural College to undertake some bank restoration work.

The project was completed using natural Willow material from the site. This was placed in the marginal area as an effective method of breaking the waves and enabling the growth of reeds to stabilise the banks.

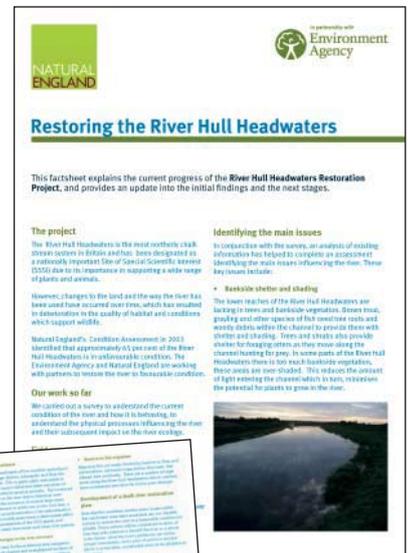
Golden Hill Fencing

The effects cattle can have on a fragile riverbank is well documented.

The middle reaches of the West Beck were being heavily impacted due to an inadequate electric fence.

The Trust using EA funding in partnership with the Golden Hill Fishing Club erected a new, more substantial fence.

This project has helped protect over 1900 metres of river bank.



Gypsy Race Fisheries Survey 2008

Gypsy Race is a groundwater fed, winterbourne chalk stream which discharges direct into the North Sea at Bridlington. Part of the approximately 25km long watercourse is dry for several months of the year with the exception of the deeper pools. Several species of fish are believed to survive within the stream with reports of large trout being caught.

Surveys have been carried out on the stream in order to establish the baseline fish population prior to instream habitat improvement works. These works are designed to protect the existing population of fish and enhance the natural environment to increase recruitment and juvenile survival.

Biological Surveys have been carried out on this watercourse since 1990 through kick sampling and King's College carried out eel specific surveys in 2005. The results of these surveys are included in the report.

Methods

2008 Fisheries Surveys

All sites were surveyed using electro-fishing. This is a common fisheries survey tool, which enables a stretch of river to be surveyed using a localised electrical current to temporarily 'stun' fish allowing them to be netted easily. They are then placed in a recovery bin or keep net until the end of the survey when they are identified, measured and a scale sample taken before being returned to the river.

All sites were surveyed over 40-50m lengths of stream with 'stop-nets' used to reduce the risk of fish evading the electrical field. Minor species were recorded on a log abundance scale with major species individually counted.

2005 King's College Eel Surveys

King' College carried out surveys on the eel populations throughout the River Hull Catchment and the East Riding of Yorkshire to determine the current state of the eel populations. This was part of a nationally funded Environment Agency project.

The two sites on Gypsy Race were



Minnows in spawning colours



A typical East Riding of Yorkshire chalk stream trout

fished using electrofishing techniques similar to those employed in 2008; however these were fished at a very slow pace and all species other than eels largely ignored. The slow pace allows the electrofishing gear to have a greater effect on deeply burrowed eels and results in a much higher catch rate.

Biological Surveys

These have been carried out as part of the General Quality Assessment (GQA) scheme. The biological component of the GQA scheme is based on monitoring the macro-invertebrate communities of rivers. Invertebrates are used because they respond to the physical and chemical characteristics of the river, and are affected by pollutants which occur infrequently and which can not be detected by the

Gypsy Race

Following the 2008 Surveys on the Gypsy Race the Environment Agency gave consent to reintroduce brown trout to the stream. This was undertaken with the installation of a hatching box filled with gravel with the trout eggs and gravel layered to imitate a natural trout redd.

spot-sampling used for the chemical component of the GQA scheme.

Samples have been collected using three minute kick samples and the number and species of macro-invertebrates present can be used to calculate a grade for the river based on the pollution tolerance of the species present. Grade 'A' represents very good whilst Grade 'F' represents bad biological community present.

Discussion

Survey results for Gypsy Race show fish present at all survey sites in varying numbers. Minnow and sticklebacks are the most abundant species and are a good food source for trout and many bird species. These species are tolerant of poor environmental conditions and will survive in isolated pools as the stream dries during the summer.

The mean daily flow data shows that between August and November the

Results

2008 Fisheries Survey Results

Site	NGR	Survey Site Area	Fish Numbers		
			3-Spined Stickleback *	Minnow *	Eel
Willow Garth (1)	TA1268467647	175m ²	10 - 99	-	-
Boynton Hall (2)	TA1388367914	250m ²	10 - 99	10 - 99	1
Beech Brook Farm (3)	TA1427067816	250m ²	-	10 - 99	-
Gauging Weir (A165) (4)	TA1654267536	200m ²	-	1 - 9	-

* For Sticklebacks and Minnows abundance estimates where used.

2005 King College Survey Results

Site	NGR	Fish numbers	
		Eels	Sea Trout
6 Acre Plantation (Near site 1)	TA1280067700	3	-
Bridlington (Site 4)	TA1650067500	3	2

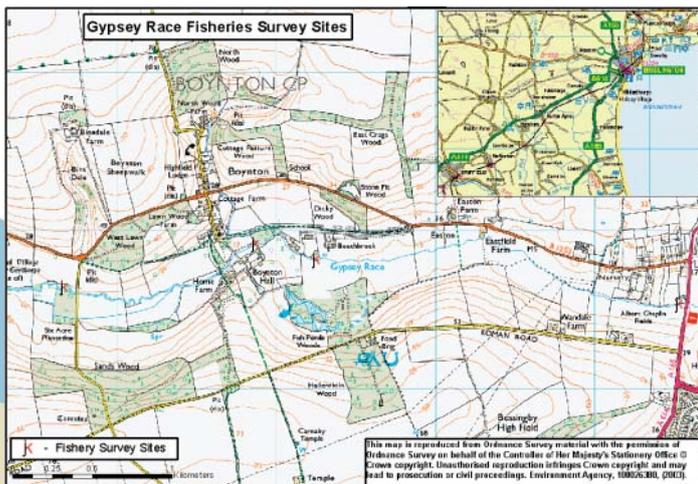
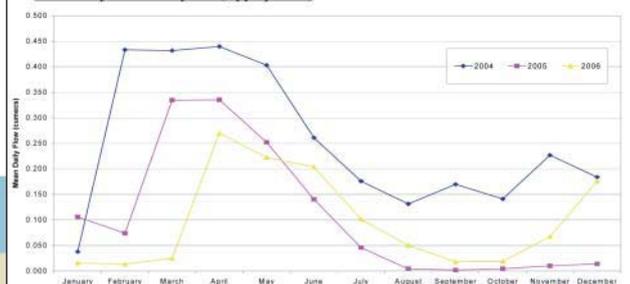
Summary of Biology Results

Year	1990	1995	2000	2002	2005
Grade	d	e	d	c	c

Comments made by biologists during sampling.

Date	Comment
12-Mar-90	Site dried up for most of 1989. Very little water now present and very little flow.
06-Dec-90	Dry Riverbed.
14-Dec-90	Dry Riverbed
26-Oct-98	Dry
14-Oct-99	Dry. Few scattered pools. Also oily scum on surface
01-May-03	Dry
17-Sep-03	Dry
27-Oct-05	Stream completely dry upon visit

Mean Daily Flow at Boynton (Gypsy Race)



stream is at most risk of drying up. In 2005 the level was extremely low and flows did not recover until April 2006. Multiple years of low water levels will exacerbate the existing flow problems within the stream for fish. Low flows are likely to result in warmer water temperatures and decreased oxygen levels.

The absence of brown trout in the results suggests that the conditions during the summer are not favourable to support this species or that the surveyed sites do not hold trout. Surveys could be carried out later in the year when less water is present so that pools can be targeted which must be holding trout if they are present.

Two large trout caught during the King's College surveys suggest that the species may be present within the system. These may have been sea trout, which migrated up the stream to spawn although this has not been confirmed through scale analysis. The presence of these trout indicate that this species may be present within the system or the potential exists to develop a population should migrating fish be able to spawn successfully. Further surveys targeting trout during the migration period would allow better analysis of the situation regarding this species.

The presence of eels in Gypsy Race is important. The life cycle of eels is fairly complicated with adults migrating to the Sargasso Sea to spawn and elvers (juvenile eels) returning to the UK. Eel recruitment to the UK is known to have crashed in the early 1980's and is now believed to be less than 1% of the historical levels for the country as a whole. The number present in Gypsy Race is low and may be as a result of the low flow summer conditions restricting movement within the stream.

Biological surveys of Gypsy Race carried out since 1990 show a marginal improvement in water quality. Changes to water quality at this point in the stream are likely to be largely led through quantity of water although a small Sewage Treatment Works is present in Rudston some 3.2km upstream of Site 1. Nutrient run-off from farmland may also be having an impact on the watercourse.

Problems with biological sampling are evident in comments made by biologists visiting the site for samples, recording a dry streambed on numerous occasions. Biological sampling could be carried out at the fishery survey sites to demonstrate if improvements carried out for fish also have benefits for the invertebrates.

Reports have been made of crayfish

FOCUS ON THE WATER SHREW

This elusive small mammal can be found in chalk stream habitats and is an indicator of good water quality. It is often overlooked and under-recorded as it is very rarely seen.

Measuring around 10cm in length and weighing between 10 and 22 grams, the water shrew has a characteristic dark coat with distinctive white under parts and often has white ear or tail tips.

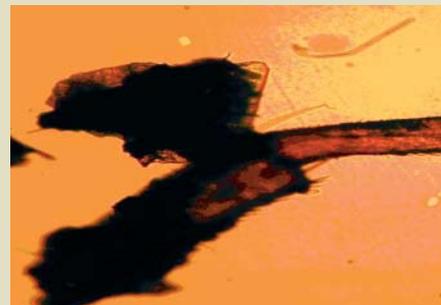
It is semi-aquatic and has several adaptations for this lifestyle, including a thick coat with dense undercoat and short bristly hairs along the inside of its hind feet and the underside of its tail. These help it to swim and dive for its aquatic prey.

From late spring onwards, the Water Shrew may have as many as three litters in the year, each containing as many as eight young. Like many small mammals they are short lived and many youngsters don't survive more than a few months. Adult water shrews have been known to survive 18 months but more typically live for around 9 months. Thus a youngster born this summer will hopefully survive the winter and breed the following year, keeping the overall population stable.

As mentioned earlier, aquatic prey form a significant part of its diet and the



Adult water shrew showing white tips to the ears



Aquatic prey remains are clearly seen when viewed under a microscope

water shrew is the only shrew species to catch aquatic prey. Surveys for water shrews can be carried out by using bait tubes and then looking at any scats (droppings) found in the tubes, under a microscope.

Remnants of prey species, including freshwater shrimp, water slater and caddis fly, are clearly visible in the scats when viewed under a microscope, with limbs often seen and the whitish exoskeleton of freshwater shrimp also obvious.

within Gypsy Race, but no evidence of their presence was apparent during the fisheries surveys and it is advised that specific crayfish surveys be carried out in order to establish their presence and species.

Of interest was the presence of water voles at Site 4. This was confirmed through the presence of a water vole on the stream bank and was observed for several minutes. Holes in the banks were present at several of the sites but thorough investigation of these was not carried out. Surveys to establish the spread of this species within Gypsy Race may be required.

This species is an important UK Biodiversity Action Plan (BAP) species and water vole habitat is protected under Schedule 5 of the Wildlife and Countryside Act 1981. Section 9 (Part 4) now protects its places of shelter, but not the animals themselves.

Recommendations

- Fish surveys to be carried out to target migrating fish species at appropriate time of year.
- Monitoring of the fish population for a minimum of three years post habitat improvement works
- Monitoring of invertebrate communities to assess changes as a result of fish habitat improvements. Surveys to be carried out before and after works have been carried out.
- Carry out surveys to assess the water vole and crayfish populations and the impact that the habitat improvements may have on them.

Driffield's brown trout population to benefit from weir transformation

The population of brown trout in Water Forlorns in Driffield has received a boost thanks to the hard work of the East Yorkshire Chalk Rivers Trust and students from Bishop Burton College.

The fish, whose natural spawning grounds are located just upstream from the weir near the Exchange Street Bridge, were prevented from reaching the grounds by the original construction, which was too high and too deep for them to swim over.

Alan Mullinger, director of the Trust was approached by the owner of the stretch of water containing the weir.

He said: "The riparian owner of this small section of Water Forlorns contacted the trust as he was interested in improving the aesthetic appeal of the stream.

"He had installed the original rock weir some years ago and wanted the advice of the Trust on further improving the stream.

"We advised him that the weir in its original form was acting as an obstruction to the spawning migration of the resident brown trout population. It was also causing siltation of the gravel on the stream bed."

The weir was causing a restriction in the speed and volume of flow, which meant that silt deposits were building up above the weir. Trout were attempting to spawn, but as they prefer clean gravel of a certain size in which to lay eggs, successful spawning would not have been possible.

The Trust called on the fisheries management department of Bishop Burton College, who had worked with them on a number of other projects, to

Water Forlorns, Driffield

A project to improve this small chalk stream was identified in 2007 and following an advisory visit by the Wild Trout Trust it was decided to undertake further work and submit proposals to the local council.

This small stream has the potential of becoming an important attraction to the Driffield town centre.

The stream contains a resident wild brown trout population. This habitat is under pressure from recent planning proposals and developments in the Driffield Town centre.



help them out with the redevelopment.

Lecturer Paul Coulson was only too pleased to help.

"I didn't hesitate in accepting Alan's offer of work. My students are always keen to develop their practical skills so I took six students along to see what we could do," said Paul.

"Work on the site involved moving the existing weir and converting it into a suitable form that would allow trout to access the upper section of the stream and improve the flow diversity."

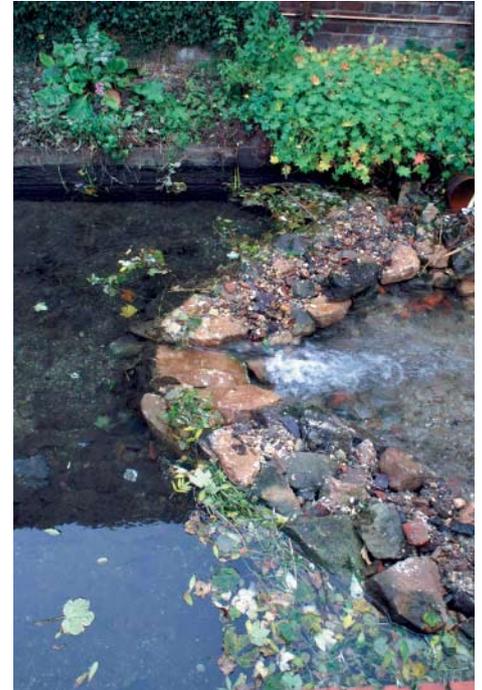
Alan Mullinger explained further: "The rocks were reformed into an upstream-pointing 'V' and any spare material was used to narrow the stream to create a bed suitable for the establishment of marginal plants."

"The resulting faster flow past this section would then remove the silt deposits and improve habitat."

The back of the new weir was built higher than the rest and as the water flows through the high, narrow channel that has been created, a scour forms, which keeps the gravel immediately downstream of the weir free of silt and other deposits.

This allows the fish not only to spawn there if they wish, but also to build up momentum to navigate the new weir.

Within minutes of the work being completed, trout were seen moving



through the new weir on their way upstream and, according to the Trust, this migration has continued with large numbers of fish successfully moving through the system to the spawning gravels.

Paul Coulson said: "The fish were jumping as soon as we'd finished, which gave the team enormous satisfaction, and the fact that the work was totally sustainable, with nothing left behind and nothing taken away, is great.

"Hopefully this new system will enable Driffield's population of brown trout to grow."

Links

www.bishopburton.ac.uk

www.eastyorkshirechalkriverstrust.org

Trout in the Classroom Project

In partnership with the Environment Agency, the Trust have been given three sets of equipment to work with local schools in this very interesting project.

The equipment comprises an aquarium, a chiller unit to keep the water temperature at a suitable level and a water filtering system.

The aim of the project is to introduce trout eggs into the chosen schools. The pupils will then see the arrival of the eggs and be able to witness the eggs hatching.

The pupils will be able to feed the trout up to a stage when they will participate in the release of the fish into a local stream.

The project facilitates learning across the school curriculum and encourages interest and ownership in the children's local environment.

The Trust will continue to build on this project as it fulfils the Trust's educational aims.

