RIBBLE RIVERS TRUST

Annual Newsletter: Issue 11 | 2015

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Suggested donation: £1

FISH PASSES: DO THEY WORK?

PhD student Mike Forty assesses the efficiency of our fish passage solutions

RIVERS IN THE CLASSROOM

Educating the future guardians of our rivers

STOP THE SPREAD!

Simple ways to prevent invasive species spreading

URBAN RIVER RESTORATION

Improving Burnley's rivers for people and wildlife

CATCHMENT PARTNERSHIPS - WATER FRIENDLY FARMING - FISH SURVEY RESULTS

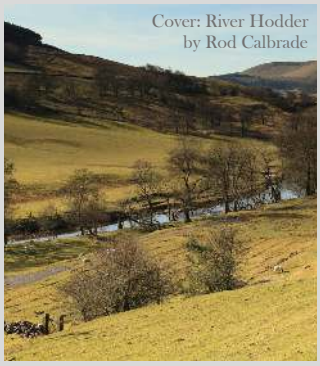
Day ticket fishing from £5

Photo: Rod Calbrade

Game and coarse fishing at several locations around Ribble Catchment, including main Ribble and Calder rivers.

The Angling Passport scheme aims to highlight the importance of maintaining a clean and healthy river as a valuable asset to recreation and the local economy. Proceeds from the ticket sales are invested back into our river conservation activities.

Buy your tickets online at;
www.theriverstrust.org/passport/ribble



Cover: River Hodder by Rod Calbrade

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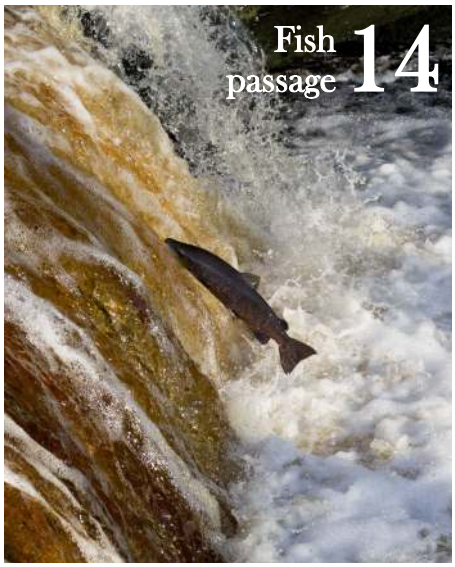

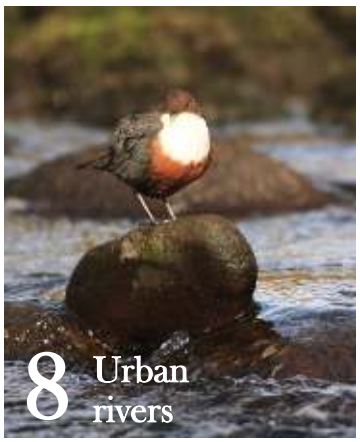

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Photo: Rod Calbrade

Welcome

A word from the Chairman and Director

Another hectic and successful year has passed, with significant amounts of improvements to the catchment delivered and monitored. This newsletter covers all the key highlights of 2014 and our aims for 2015. Our dedicated team of staff and volunteers should be widely congratulated on their fantastic efforts (not forgetting the awards they have won).

The Trust has had a successful 6-year period of sustained funding from a range of sources, however the significant funding to improve rivers to meet the Water Framework Directive (WFD) requirements comes to an end on March 31st 2015. However the Trust's work is not solely about the WFD, it is about improving catchments for the benefit of wildlife and importantly, people. Healthy catchments provide us with hugely valuable resources, such as the water we drink, reduced flood risk, food and valued recreational spaces. To achieve the healthiest catchment possible, an all-inclusive approach with focused delivery of activities to provide these resources is needed. In November 2014, the Trust submitted a funding application to the Heritage Lottery Fund for our most ambitious project to date, to achieve just that. This project brings together all stakeholders, interest groups and organisations to deliver together. The application has requested £2m over a 5-year period to achieve this, but requires funding big and small from all those benefitting to be successful, and the Trust will be seeking contributions from all to support this project.

In addition to the Heritage Lottery Fund, the Trust has applied for funds for a 5-year project to increase the involvement of young people in improving our catchments. There has been several hundred years of degradation by people and it will take us a long time to put this right, and it is young people who are key to achieving this and who will be given this heritage in the future.

We hope that this newsletter will show how the Trust is working to make sure that we have something worth giving to our children. There are fantastic articles on what and where we are working, and also the positive improvements that our monitoring is demonstrating.

We look forward to reporting on our successes (with your help!) next year!

Jack Spees, Director and Philip Lord, Chairman

News in brief

New grants for habitat improvements

In the latter half of 2014, Ribble Trust was fortunate to secure two new grants to fund 'Keeping the Ribble Cool' - a project that seeks to increase riparian fencing and plant trees along riverbanks in order to maintain cooler water temperatures for aquatic species, reduce diffuse pollution and create habitat corridors for wildlife.

Through the Enriching Nature programme, SITA Trust granted £74,194 towards the project. SITA Trust has provided funding to biodiversity conservation projects through the Landfill Communities Fund since 1997.

The project was also able to attract a further £50,000 from United Utilities' Catchment Wise Fund, which was established by the water company in 2014 to fund water quality improvement projects across the North West. This additional funding has allowed the Trust to upscale the project and deliver habitat improvements at more sites across the catchment.

Jack Spees said *"We're extremely grateful to SITA Trust and United Utilities for the opportunity to carry our this vital work in our catchment."*

Jack Spees (left) and Neil Ashworth (right)

Victoria Woods

An award winning year for Ribble Trust

2014 was a successful year for Ribble Trust in terms of project delivery, not least for the Heritage Lottery funded Urban River Enhancement Scheme (URES) in Burnley, which gained recognition at two separate awards events.

The first success for URES was reaching the finals of the 2014 National Lottery Awards in the 'Best Environmental Project' category. The National Lottery Awards recognise and reward the inspirational work of National Lottery-funded projects across the UK. The project was up against six other environmental projects from around the UK in a public vote and ultimately placed third, achieving vital national publicity for the restoration of urban rivers.

The second success came at the Wild Trout Trust's 2014 Conservation Awards. The awards recognise and encourage excellence in the management and conservation of wild trout habitat, celebrating the efforts, skills and ingenuity of projects carried out by professionals and by grass roots voluntary organisations. The URES project once again shone through, winning the 'Best Partnership Project' award.

The awards are hugely important to the Trust, not just as recognition for the hard work and effort put in by the staff or for the publicity raising the profile of the work, but also to help increase the success rate of future grant bids so that this work may carry on for years to come.

Jack Spees (left) and Mark Rudd

Ribble Way walk raises £5,000 for charity

On 1st August 2014, Ribble Trust Director Jack Spees and Environment Agency colleague Mark Rudd embarked on an epic 72-mile sponsored walk along the entire length of the Ribble Way to raise money for the Ribble Trust and WaterAid. Despite dark clouds and torrential rain throughout, the walk was completed in 28 hours and over £5,000 was raised. Jack said *"It was an incredible experience to walk the length of the River Ribble from sea to source and we couldn't have done it without the support of friends, family and colleagues along the way. It was and experience I'll never forget."* The walk helped to highlight the need for clean water, both here in the North West and globally.

National Lottery reception at No.10

On 3rd December 2014, Director Jack Spees attended a reception with the Prime Minister at No. 10 Downing Street to celebrate 20 years of the National Lottery and its contribution to projects across the UK, following the delivery of a lottery funded urban rivers project in Burnley (URES).

Catchment Based Approach
Partnerships for Action

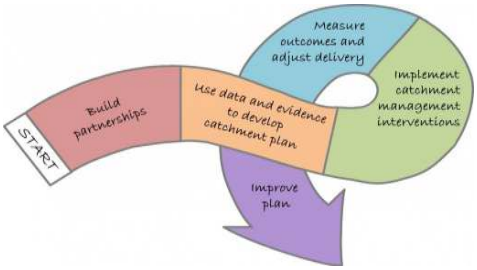
The Ribble Catchment

Catchment Partnerships

On 22nd March 2011, the Minister for Natural Environment and Fisheries announced the piloting of a new approach to improve our water environments, saying that we should:

"Provide a clear understanding of the issues in the catchment, involve local communities in decision-making by sharing evidence, listening to their ideas, working out priorities for action and seeking to deliver integrated actions that address local issues in a cost effective way and protect local resources."

The Catchment Based Approach (CaBA) as it became known, was piloted by Defra on several river catchments across the UK between 2011 and 2013 - one of which was the Ribble. During that time, Ribble Rivers Trust was able to form a strong partnership with various stakeholders from across the catchment and share data and evidence that would pave a way forward for collaboratively formulating an action plan to improve the quality of the catchment's water environments.



In June 2013, Defra released a policy framework which encouraged each of England's 87 river catchments to adopt the Catchment Based Approach. The document incorporated learnings from the pilot phase and aimed to deliver a more ambitious River Basin Management Plan that would contribute to the government's targets for improved water quality under the European Water Framework Directive. The roll-out of the CaBA was enormously successful, with almost all of the catchments across England and the Welsh borders adopting the approach.

Each catchment partnership is now led by a host organisation from the third sector. With the backing of its partnership, Ribble Rivers Trust was successful in securing this role. The partnership, which operates under the name 'Ribble Life', meets four times per year to input into, develop and ultimately begin to implement a Catchment Action Plan together.

Initial seed funding for the establishment of a pilot catchment partnership came from Defra and was distributed by the Environment Agency. Further support came in the form of an EA Catchment Co-ordinator, who engaged and collaborated with local organisations and decision makers, providing the link between specialists within the EA and the partnership. Catchment co-ordinators also facilitated good communication and information sharing throughout the development phase of the partnership.

Once the process was formalised and rolled out, further funding was made available through local and national Environment Agencies for partnerships to work towards developing an action plan to address water related issues within their catchments. Partnerships in the North West also benefitted from extra funding from United Utilities, who see the protection of natural water resources such as rivers and lakes as part of their business remit.

The seed funding comes to an end in 2015 and the catchment partnerships must find a way to fund themselves in order to continue operating effectively, such as making applications to grant-giving bodies. Ribble Rivers Trust made a bid to the Heritage Lottery Fund in November 2014 for a five-year project seeking to demonstrate and galvanise how working together in partnership can deliver multiple organisations' objectives at the same time, resulting in far greater benefit for the catchment in a much more cost effective way. By the end of the project, the aim is for the tried and tested method of collaborative working to be written into organisations' future management plans to secure improvements to the Ribble Catchment's water environments in the long term.

Ribble Life

The Ribble Life Catchment Partnership

'Creating a healthy water environment that will bring economic and social benefits for all.'

What are ecosystem services?

The health and wellbeing of people is dependent upon the services provided by ecosystems and their components i.e. water, soil, nutrients and organisms.

Ecosystems provide people with a means to; breathe, grow food and acquire clean drinking water. They also provide us with an opportunity to derive non-material benefits through cultural services such as recreation and enjoyment of nature's beauty.

A healthy functioning ecosystem also regulates climatic conditions, air quality, river flows, erosion, disease, pest control, pollination and natural hazards, such as flooding.

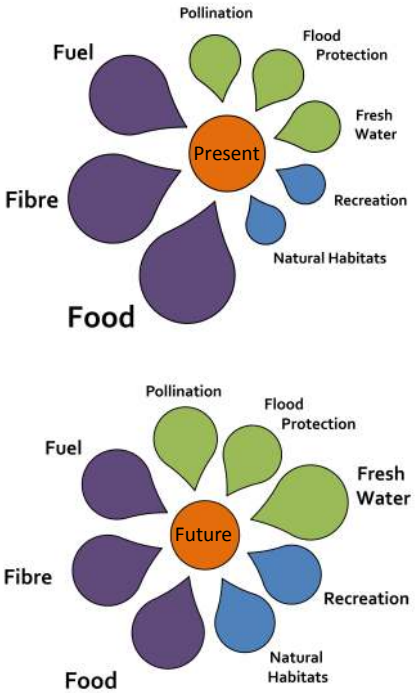
Are we only just realising this?!

Ecosystem services have always existed. Unfortunately, people started to exploit them long before we fully understood how vital they are to our survival and how exceptionally fragile they are. *The concept of ecosystem services was developed to help people to understand their dependence on natural resources and how best to manage them.*

Many ecosystem services are not currently functioning at their full potential and continue to deteriorate, impacting negatively on human health and wellbeing. One such example is the reduced ability of river catchments to store water due to urbanisation and soil compaction, leading to an increase in the frequency of flood events. This, coupled with the pressures of a growing population and the threat of climate change, means that improving our ecosystems and increasing their resilience to human activity has never been more important.

It has become increasingly recognised that restoring and enhancing the delivery of ecosystem services through improved catchment management should not only be the responsibility of the public sector, but also of the private and third sectors, i.e. charities like Ribble Rivers Trust.

So, how do we plan to deal with this responsibility and how should we go about managing our catchment so that everyone continues to derive benefits from the environment? The evidence for partnership working is ever increasing, indicating that greater environmental improvements can be made if organisations and interest groups work together. The Ribble Life catchment partnership is ideally designed and best placed to implement the changes that are needed - this will ensure that our ecosystems continue to function for our benefit in the future.



Ecosystem services functionality - present and future (courtesy of Westcountry Rivers Trust)

Restoring urban rivers

The Lancashire town of Burnley is widely recognised for its industrial heritage since it was at the forefront of cotton production during the Industrial Revolution. The reason for its success was the presence of two rivers – the Brun and Calder – which were used to power machinery in the mills and factories. Industry in Burnley has since evolved and the rivers' power is no longer required, however the environmental destruction caused by industrialisation and pollution had left a lasting legacy of damaged and neglected rivers that were unable support significant populations of riverine wildlife.

Between 2011 and 2015, with funding from the Heritage Lottery Fund and the Environment Agency, the Urban River Enhancement Scheme (URES) set out to:

"Protect and enhance both the ecological and historical heritage of the rivers in Burnley for the benefit of local communities and riverine species."

The URES project sought to achieve its objectives by shining a spotlight on Burnley's natural river heritage through a coordinated and multi-partnership approach in order to deliver lasting improvements for both people and wildlife. This resulted in the local communities having a better understanding and respect for their rivers with a greater inclination to protect their natural asset beyond the scope of the project, as well as an improved physical habitat that is able to support greater numbers of fish, invertebrates, birds and mammals.

Rivers function as a dynamic system so anything that happens upstream can affect the area downstream and vice-versa. With one of the worst affected areas of the catchment now improved and communities' appreciation for their rivers rekindled, there will undoubtedly be positive knock-on effects for the entire Calder Catchment.

Achievements and impact

Increased habitat connectivity: 5 separate reaches of the rivers Calder and Brun were successfully altered to improve the habitat for local and migrating fish populations. 1 fish pass and an eel pass were installed on Burnley's oldest weir.

Bankside improvements: 5 local groups were set up to tackle litter and invasive species on riverbanks. 67 volunteer days were held, undertaking activities including clean-ups, invasive species control, tree planting, wildflower planting, constructing otter holts and sprucing up railings. Artwork was installed at one riverbank location to draw the public's attention.

Volunteers: 1,698 individual volunteers were involved in the project, giving over 8,198 hours of their time.

Improved access: Physical access to the rivers was increased by installing 2 bridges (one of which was constructed by the Army and Prince's Trust volunteers) and 3km of footpath was improved. The project also increased the visual access to the rivers by creating 2 viewing windows in bankside railings. Intellectual access was enhanced by erecting 3 interpretation panels to inform the public of the heritage and wildlife of the rivers.

Community events: The URES project organised 12 community events (including the Big Splash event in the town centre) and attended 15 other community events such as the Canal Festival and the Woodland Festival.

Temporary exhibitions and displays: The project held a temporary exhibition for 5 months in the windows of an unused town centre shop. River-themed photographs were also exhibited for a day in the town centre. A river painting was commissioned which now hangs in Towneley Hall Art Gallery.

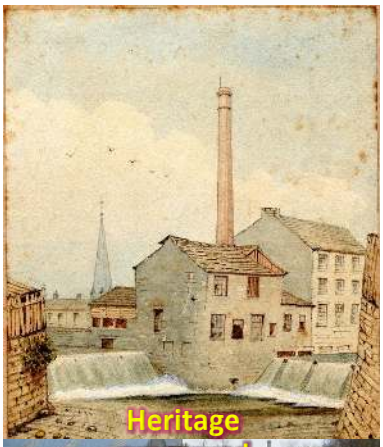
Walks and talks: 7 guided river walks were held and 33 presentations were delivered, reaching an audience of 1,579. In addition, 3 heritage trails and guide books were developed.

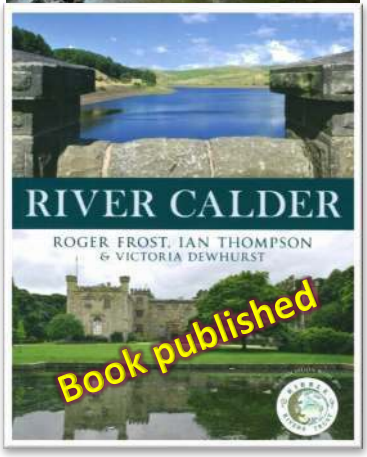
Outreach sessions in schools and colleges: There were four main ways the project engaged schools; two years of running 'Rivers in the Classroom' with 9 primary schools, over 800 secondary school children from 27 schools and community centres were involved in 'When You See Water' drama workshops, 14 young people gained an Arts Award qualification through 'Undercurrents' and all pupils from the Mohiuddin International Girls' College celebrated the opening of the fish pass adjacent to their college.

Training: 30 people completed a WEA recognised River Habitat Management Course, 15 volunteers gained qualifications to treat invasive plants adjacent to watercourses, 30 volunteers became certified by the Riverfly Partnership to monitor river invertebrate populations, 14 college students gained an Arts Award qualification and two teacher training events were held prior to running 'Rivers in the Classroom'.

Visits: The project hosted some notable visits; a site tour for the Burnley MP Gordon Birtwistle, the attendance of the Mayor and Mayoress at several opening ceremonies (including the fish pass, bridge and footpaths), the government Minister for Health attended a river clean-up and representatives from Defra visited the construction works, who were extremely positive about the community benefits that were being derived from their investment in the river works through the Environment Agency.

Other activities: 20 people were involved in recording an oral history of Burnley's rivers and over 100 entries were received for a river-themed photo competition – 258 public votes selected the winners. A new book *'River Calder' by Roger Frost, Ian Thompson and Victoria Dewhurst* was published and the launch was attended by over 80 people.





Supported by The National Lottery® through the Heritage Lottery Fund

heritage lottery fund

Environment Agency

Working with farmers

Project background

A sizeable area of the Ribble Catchment is intensely farmed, so working with farmers to improve the way land is managed is crucial to achieving healthy watercourses. Ribble Trust has been working with farmers since it was established in 1998. This work was scaled up significantly in 2012 when the Trust was granted funding from Defra's Catchment Restoration Fund.

The issues

Many of the Ribble Catchment's rivers and streams are failing to achieve Good Ecological Status as set by the EU's Water Framework Directive because of diffuse pollution, poor habitat and obstructions to fish passage. Bathing waters along the Lancashire coast are also failing to meet safe standards, partly as a result of faecal inputs from agriculture. A distinct lack of tree cover is contributing to the impact that climate change is having on our rivers and the way in which farmland is managed often increases the risk of flooding. From the farmers' side of the story, they're losing vital soils and nutrients from their land through erosion and having to spend more money to compensate.

Objectives

Ribble Trust understands the many pressures that farmers face and forging good working relationships is key to ensuring that long term improvements are made. Farm appraisal visits are offered, highlighting quick-fix opportunities which will not only benefit the environment, but also improve the farm and furthermore, save the farmer money. Farmers often contribute to the cost of the work by undertaking some of the works, supplying materials or even making a cash contribution. Since 2012, farmers in the Ribble Catchment have contributed more than £30,000 to improving farms for water. Where works are required that exceed the Trust's budget, the farmer is signposted towards other support.

Solutions

The majority of the Trust's work on farms involves the installation of riparian fencing to exclude livestock from the watercourse. This helps to reduce poaching, erosion, loss of soil and sedimentation, as well as preventing the direct input of faecal matter. Vegetation along the riverbank is able to flourish, creating a buffer strip that intercepts runoff of soil and nutrients from the field and reduces bank erosion. Solar powered drinking troughs can be installed to maintain a water supply to the livestock and these are placed on hard-standings to reduce soil poaching.

Trees are often planted within the fenced off areas. Once matured, they will shade the water and keep temperatures cool for fish - something that will become increasingly important with the expected rise in temperatures associated with future climate change. Trees also reduce soil compaction, increasing the ability for groundwater storage and thus reducing flood risk. The additional habitat created by undertaking these works benefits wildlife, increasing biodiversity within the catchment.

Other works that are undertaken on farms include the installation of large woody debris to protect badly eroding banks and enhance habitat, bridge alterations to improve fish passage, installing crossing points and stoning gateways to reduce soil erosion, concreting farmyards and repairing guttering to aid with clean and dirty water separation, roofing manure stores and creating small wetlands to reduce runoff.

Raising awareness

Many farmers and land managers do not realise that their activities have such a significant impact on rivers and streams, so increasing awareness is key. Ribble Trust does this by hosting farmers meetings and farm demonstration events, focussing on topics such as managing manure in wet weather, soil management to reduce compaction, nutrient management and drainage. A Water Friendly Farming Guide has been produced as well as a guide to slurry and manure applications. A number of agricultural shows have also been attended.

Benefitting wildlife

The Trust undertakes annual fish and invertebrate surveys, as well as walkover surveys to assess the impact that working on farms has had on local wildlife populations. These have shown that fish, especially salmon and trout, and invertebrates have benefitted from the improved water quality and habitat, and as a result other species such as white clawed crayfish, otters and birds will also benefit.

Delivery

Farm improvements have been delivered with a combination of the farmers themselves, contractors and hard-working volunteers, including several corporate teams from 3M, Greggs, the Environment Agency and United Utilities.

Funders

The Trust's work with farmers has been funded largely by Defra's Catchment Restoration Fund, Natural England's Catchment Sensitive Farming scheme, the Environment Agency, Lancashire Environmental Fund, United Utilities and their Catchment Wise fund, SITA Trust's Enriching Nature Programme, Forestry Commission and the Woodland Trust. Funding has been secured to continue this work into 2016.

Leagram Brook - before and after riparian fencing and tree planting

Solar powered drinking troughs

Leagram Brook - before and after installation of large woody debris

River Ribble at Stainforth - wetland creation

Pipe bridge replaced with clear-span bridge to enable fish passage on Leagram Brook

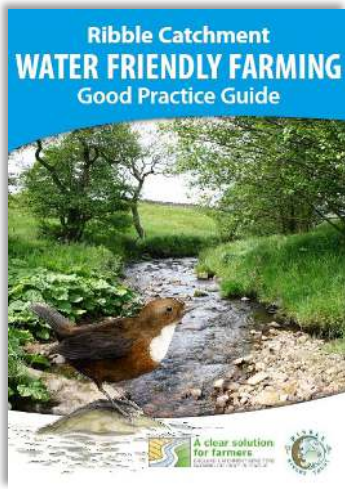
Stoning gateways reduces erosion

Skirden Beck - concreting yard to reduce runoff

Guttering repaired

River Loud - roofing manure stores

Farm demonstration events



Rivers in the classroom

Children are the future guardians of our rivers, so education about the importance of wildlife and conservation is vital to ensuring that our efforts are sustained beyond our lifetimes. Education Officer **Neil Ashworth** describes how Trout in the Classroom has evolved.

Thanks to a grant from the Heritage Lottery Fund, Ribble Trust has been able to purchase additional trout tanks and develop the educational programme to align it better with schools and the National Curriculum.

New teacher training sessions are providing schools with everything they need to know about the upkeep of their tanks and rearing the trout from eggs to fry, while teachers' feedback has already given the Trust an invaluable insight into how the initiative could link with other aspects of the children's learning, for example literature, art, music, science and more.

Bringing the river environment into the classroom gives children a unique opportunity to uncover the elusive world of brown trout in a completely hands-on way, allowing them to directly contribute to their local environment. The children witness first-hand how the fish evolve from eggs to alevin, from fry to parr and ultimately to full grown trout swimming in their local river. By discovering more about the lifecycle of the trout and their need for good water quality, clean spawning gravels and suitable habitat, it is hoped that the children will grow up with a greater respect for the environment and inspire them to appreciate rivers later in life.

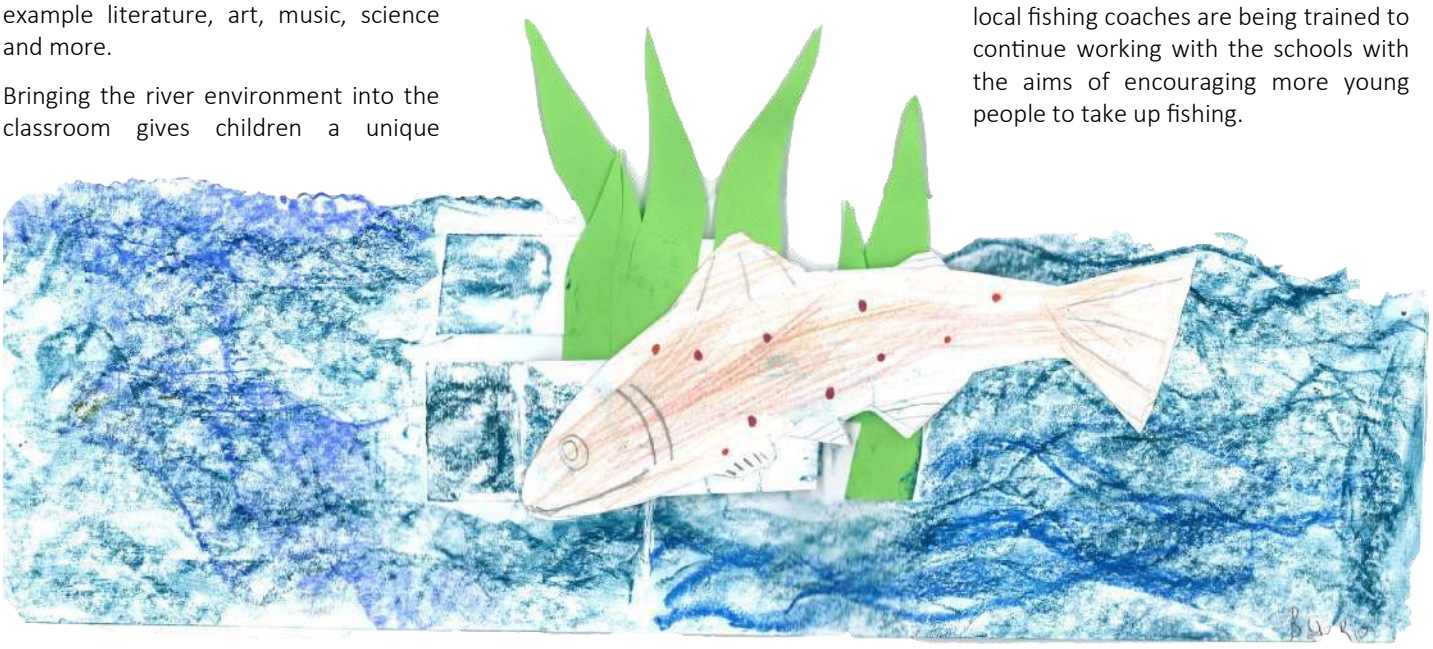
"The children were given experiences and learning opportunities both inside and outside of the classroom which enriched and enhanced their understanding of the local area. They were given an insight into environmental issues through first-hand experience."
- Primary school teacher

River in the Classroom takes place every year in primary schools across the catchment. Tanks are installed into classrooms in December so that they are ready to receive trout eggs in January. The eggs soon hatch and the children are able to watch the fish as they grow. Three months after hatching, the trout are ready for release and the children are taken to their local river to watch as their fish are released into the wild.

Funded by the Heritage Lottery Fund, the initiative was expanded upon in 2014 and 2015 by inviting professional artists to run river-related artistic sessions with the children. This resulted in high quality work being produced, utilising art, music, creative writing and puppet making.

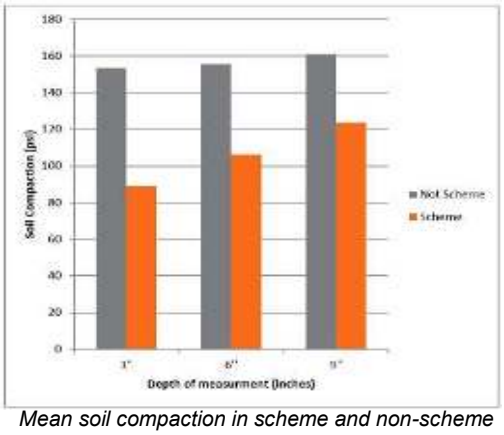
Also in 2014, Ribble Trust trialled its first 'Mayfly in the Classroom' scheme with some schools, making use of the tanks to house mayfly. The children were able to learn about the lifecycle of river flies as they observed the mayfly transform from the nymph stage into winged insects, which were also subsequently released at the river. The trial was a success and will be rolled out to more schools in 2015.

During the course of the project, some children took part in a angling demonstration and were given fishing lessons. This proved to be a popular activity with the schools and as such, six local fishing coaches are being trained to continue working with the schools with the aims of encouraging more young people to take up fishing.



Academic research

The restoration methods that Ribble Trust employ are accepted industry best practice, but is there proof that these techniques are effective in the Ribble Catchment? The Trust supports a small number of university students each year to determine the impact of its conservation efforts.



Mean soil compaction in scheme and non-scheme areas at varying depths of 3", 6"and 9".

Stephen Harrison from the University of York investigated whether livestock exclusion from the riparian zone improved soil compaction and the amount and diversity of flora at two of the Trust's habitat schemes on Easington Brook. He found that where livestock had access to the stream, the soil was more compacted than in the fenced habitat scheme areas. He also found that within the habitat schemes, there was greater diversity in species of flora and species richness was almost doubled compared to areas accessed by livestock.

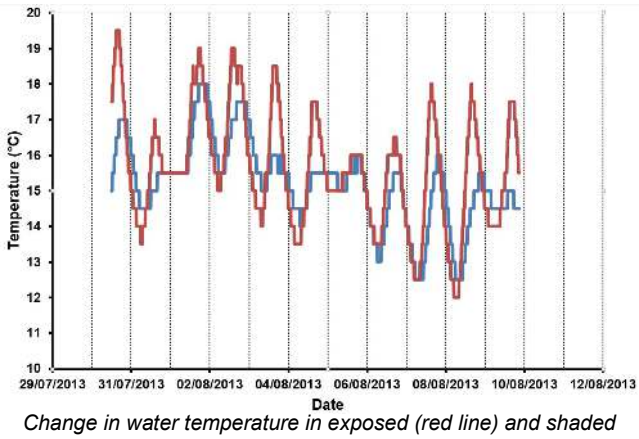
Soil compaction on farmland increases the risk of flooding, since rainfall cannot percolate into compacted soil so readily. This means that water runs off the fields rapidly into watercourses, leading to flash flooding and higher inputs of sediment and nutrients. Stephen's study indicates that within habitat schemes, soil is less compacted and the amount of flora is greater, which means a higher volume of rainfall can be held within the soil and released gradually into the watercourse, with the vegetation intercepting more of the run-off.

Jonny Ainsworth from the University of Lancaster investigated the impacts of a water abstraction point on channel characteristics and sediment transfer rates on Langden Brook. He found that the channel morphology above the abstraction point was capable of changing more frequently due to a greater availability and mobility of sediment, as opposed to the more static morphology below the abstraction point, which is starved of gravel as a result of the intake structure interrupting the natural supply.

Jonny also inferred that the makeup of the material on the riverbed together with the channel characteristics has a significant controlling influence upon the frequency of particle movement, with his tracer pebbles above the abstraction point being easily brought free from loose substrate compared to the site below, where more pebbles were compacted in place. This can reduce habitat for invertebrates and impact on fish egg survival. The study suggests that the natural movement of sediments in Langden Brook is hampered by the water abstraction point, resulting in changes to the shape of the river.

Ribble Trust has been working with United Utilities and the Environment Agency to see that bed material blocked by the abstraction point is reintroduced downstream in an attempt to reinstate the natural sediment supply and create improved spawning habitat for fish.

Karlina Ozolina from the University of Manchester monitored and assessed the effect of tree cover on river water temperature and fish abundance on Bashall Brook and Rathmell Beck, which have both shaded and exposed areas. Using remote temperature data loggers, Karlina maintained a continuous water temperature data series for both watercourses. On Rathmell Beck, the upper section is exposed with no tree cover, whereas the lower section is shaded. Karlina found that although the average temperature at the two sites was similar over a 10-day period, the daily temperature fluctuations were more extreme at the unshaded site. There, the daily maximum temperature was between 1 and 2.5°C higher compared to the site with tree cover.



Change in water temperature in exposed (red line) and shaded (blue line) areas of Rathmell Beck over 10 days

The study indicates that river water is being cooled in the summer where there are riparian trees providing shade compared to where they are absent. The findings provide the context for Karlina's laboratory experiments on brown trout swimming ability and physiology which are hampered by elevated water temperatures. Kalina's study lends further evidence that more riparian trees are needed to protect our rivers in the face of climate change.

Fish passage

PhD student **Mike Forty** from Durham University has been evaluating the efficiency of several of our fish passage designs. Here we report on some of his early findings.

Historically, our rivers have been subjected to human intervention through the construction of dams, weirs and culverts etc. These structures can cause many issues for watercourses, including fragmentation of habitat. Barriers to upstream fish migration can present delays in accessing spawning grounds or even deny access completely. Reduced spawning habitat availability, together with fewer numbers of fish that can reach it and the condition of those fish when they eventually get there, impacts greatly on population numbers, condition and dynamics.

Mike aimed to investigate patterns of upstream migration in relation to barrier impacts using the method of PIT telemetry to quantify the efficiency of some of Ribble Trust's fish passage designs.

PIT tag (not to scale)

PIT telemetry involves inserting a tiny transponder into the fish in a similar way to micro-chipping pets. Wire antennae are strung across the river and detect when a tagged fish swims beneath. Using this setup, it was possible to record when a fish arrived at the foot of the obstacle, whether that fish was successful or not in overcoming it, how many attempts it made and how much time it took.

Swanside Beck

Mike evaluated the efficiency of two cumulative barriers on Swanside Beck. The first was a flat-faced weir fixed with a low cost baffle solution and the second was a traditional pre-barrage pool-weir traverse design.

Swanside 1

Swanside 2

	Swanside 1				Swanside 2		
	Number of fish tagged	No. of fish attempting	No. of fish successful	Efficiency	No. of fish attempting	No. of fish successful	Efficiency
Brown trout	588	158	111	70%	100	78	78%
Sea trout	5	4	4	100%	2	2	100%
Atlantic salmon (juvenile)	45	2	0	0%	-	-	-
TOTALS	**638**	**162**	**113**	**70%**	**102**	**80**	**78%**

Chipping Brook

Assessments were also conducted on Chipping Brook to test the effectiveness of a pool-weir traverse fish pass as well as to measure the barrier effect of a weir and 70 m long concrete culvert.


Chipping 1

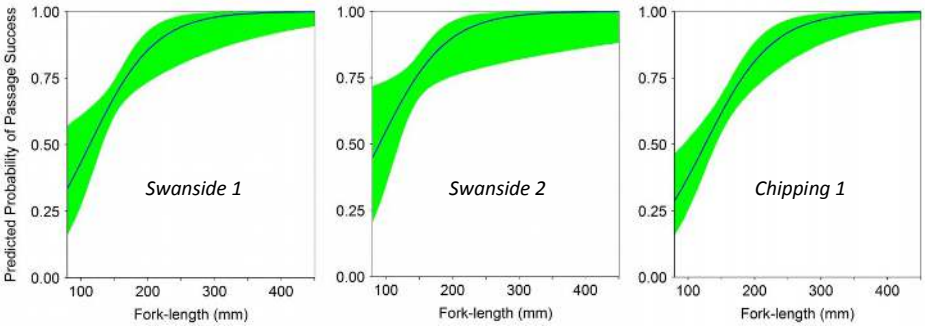

Chipping 2

	Chipping 1				Chipping 2	Weir		Culvert	
	Number of fish tagged	No. of fish attempting	No. of fish successful	Efficiency	No. of fish attempting	No. of fish successful	Efficiency	No. of fish successful	Efficiency
Brown trout	644	197	103	52%	59	56	95%	22	39%
Sea trout	2	2	2	100%	-	-	-	-	-
Atlantic salmon (juvenile)	46	7	2	29%	2	2	100%	2	100%
TOTALS	**692**	**207**	**108**	**52%**	**61**	**58**	**95%**	**24**	**41%**

Prior to works being undertaken, the two weirs on Swanside Beck were impassable barriers to upstream migration, therefore Mike's results indicate that the designs are functioning well. During Mike's study, no adult salmon were able to be tagged so were not observed ascending either structure. **However electrofishing surveys in 2014 found salmon fry above both weirs for the first time in the Trust's monitoring history** (see page 18), displaying evidence that adult salmon ascended both structures and successfully spawned in the autumnal migration season.

It was found that the fish passage solution implemented at the Chipping Brook weir was not functioning as effectively as those on Swanside Brook. As such, Ribble Trust revisited the first design and modified it so that the flow was improved. The efficiency of the modified solution is being reassessed. The culvert on Chipping Brook remains a significant challenge, since design options are limited due to the fact that structures placed inside the culvert will increase flood risk to the houses above.

Predicted probability of passage based on length of fish



Size matters!

Additional modelling was undertaken to work out the probability of a fish ascending an obstacle based on its length (see graph below). It was found that Swanside 1 and 2 and Chipping 1 each performed well for brown trout over 250mm, with chances of success being between 90 - 100%. However success varied greatly for smaller fish, with Chipping 1 seeming to prove the most difficult for smaller brown trout to pass through.

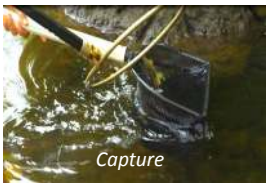
Monitoring obstacles to fish migration in this way helps to inform which fish passage design options should be considered for future works. It can also help in prioritising works by determining which weirs have the greatest impact on fish migration.

In addition to assessing the efficiency of fish passage solutions on Swanside Beck and Chipping Brook, Mike undertook the same study on a series of fish easements constructed by Ribble Trust on Colne Water and assessed the impact of installing large woody debris to increase the available habitat for fish on Gayle Beck in the Yorkshire Dales. This ongoing work will evaluate the level of success of conservation efforts undertaken by Ribble Trust using Defra's Catchment Restoration Fund. Mike also monitored the impacts of the urban channel alterations on the rivers Calder and Brun in Burnley as part of the Heritage Lottery funded URES project (see page 8). His PhD study continues through 2015.

Fish surveys


Electrofishing method


Mild electric current


Capture


Measure

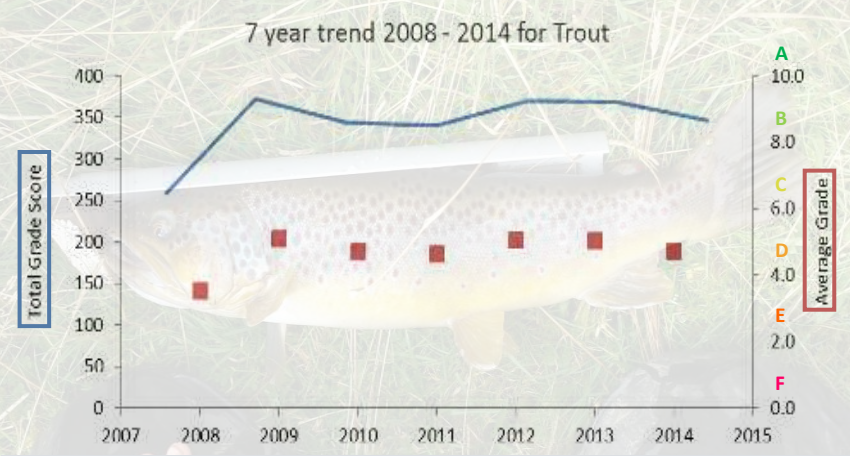

Release

Fisheries Scientist **Gareth Jones** reports on results and trends from his fourth summer of electrofishing surveys across the Ribble Catchment.

Electrofishing surveys have been a core activity for rivers trusts since their introduction by the Tweed Foundation over twenty years ago. They provide us with not only a catchment-wide perspective of our local fish populations, but also help us to identify new opportunities for habitat improvements. Our presence on the river means we can observe current conditions whilst meeting with local landowners and users.

Over 330 sites were surveyed during the summer of 2014. This extends our coverage over the previous year and increases our research portfolio. The achievement was reached through use of a second monitoring team led by our Assistant Fisheries Scientist , Paul Peters.

The Ribble Catchment is fortunate to have widely dispersed, generally healthy trout populations. Hodder and mid-Ribble tributaries continue to perform well as rearing grounds attestation to their local environments. All of the tributaries that feed the rivers flowing through our Calder Valley towns comprised top grade trout reaches too. Where abundant trout fry are located, natural conditions lend an advantage towards those migrating to sea. The early signs have been encouraging with a confirmed sighting made this year of a sea trout found during Ribble Trust construction works in Burnley town centre. Sea trout are typically encountered through mid-summer. Generally, these arrive in our Hodder surveys first. We now hope that the same will be said for their Calder neighbours next summer!



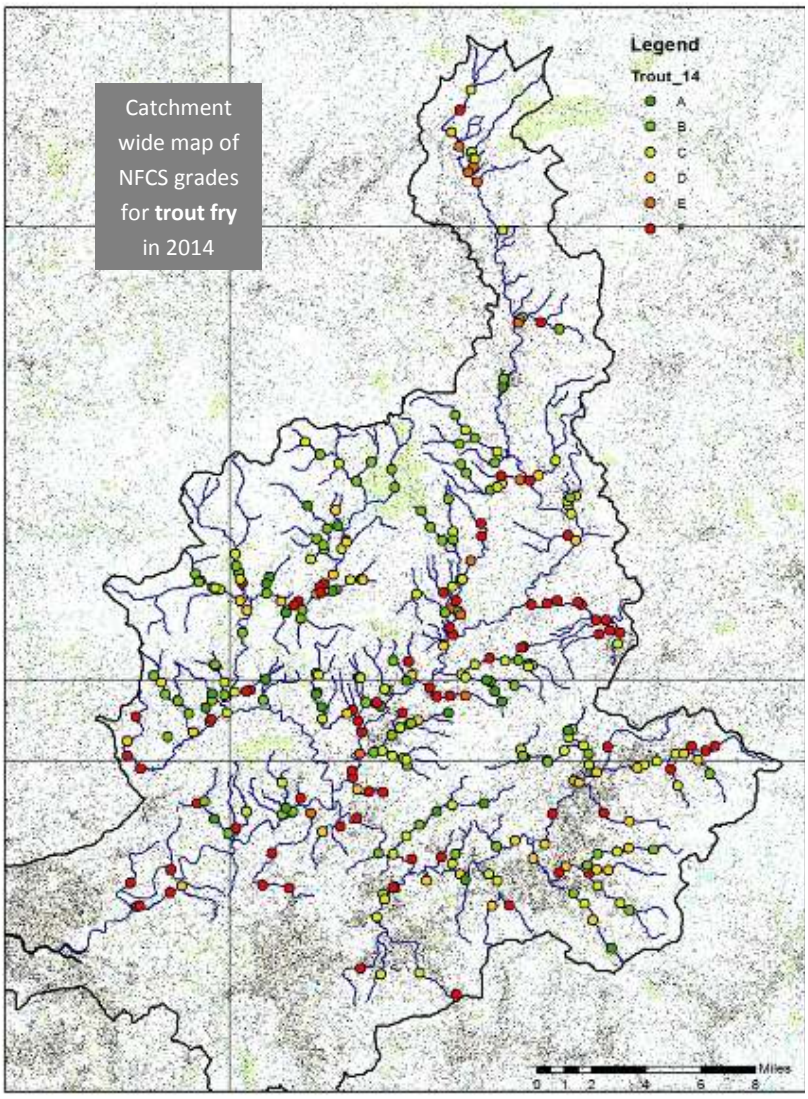
Catchment-wide trout grade scores for repeated sites over the past seven years

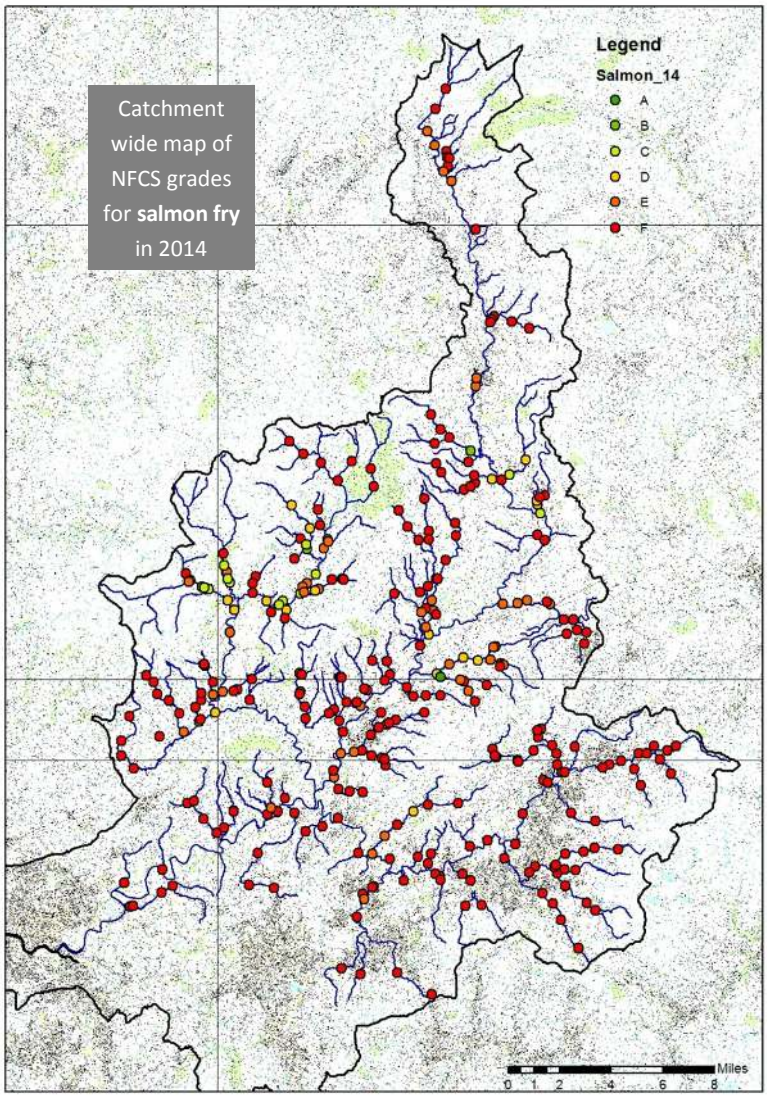
Lower densities of trout have always resided throughout of the lower Ribble tributaries, upper Loud and Stock Beck since RRT surveys started. This year was no different. These watercourses remain a key focus as we seek to improve the habitat there, although the presence of other aquatic species looks favourably for Stock Beck.

Seven years' worth of data for repeated sites now provide us with a better catchment-wide understanding of this year's results. Whilst more sites showed fewer trout fry compared to 2013, the longer term trend shows this reduction was limited (see graph below) with 2008 and 2011 attaining lower grade scores. The response of juvenile trout in dry summers is undoubtedly to drop back towards cooler and deeper sections of river and therefore are less likely to be captured during surveys. A reduction in juvenile trout in our small becks may therefore have been anticipated given the conditions during 2014. Such findings are not unique and are consistent with those upon other catchments, such as the Tweed. By retaining more water in and shade over our rivers in summer, we are presenting more favourable conditions.

The electrofishing capture of salmon in sites across the whole of the catchment was comparable to the previous year with a minor deterioration over the previous year. The true impact is considered to be negligible given the wider dispersal of salmon that has occurred. River conditions have been far more conducive to covering the ground quicker and therefore, with greater survey coverage many of the sites were visited later than the previous year. Whilst the Calder sub-catchment remains largely absent of salmon the positive news from page 18 of this newsletter presents cause for optimism.

The catchment's most important spawning areas exist throughout the mid to upper Hodder and its tributaries below Stocks Reservoir, alongside Sabden Brook on the Calder and the tributaries of mid-Ribble up to Settle. Smaller populations of salmon persist in the upper Ribble and lower ends of the River Loud, Dean and Mearley Brooks and Stock Beck. It is these ephemeral populations that must be afforded greater attention to improve their habitats if we are to see the Ribble's run of salmon improve.





Maps of the Ribble Catchment showing the distribution of population densities of salmon and trout fry in 2014

Salmon tracking

A tagged springer from 2014

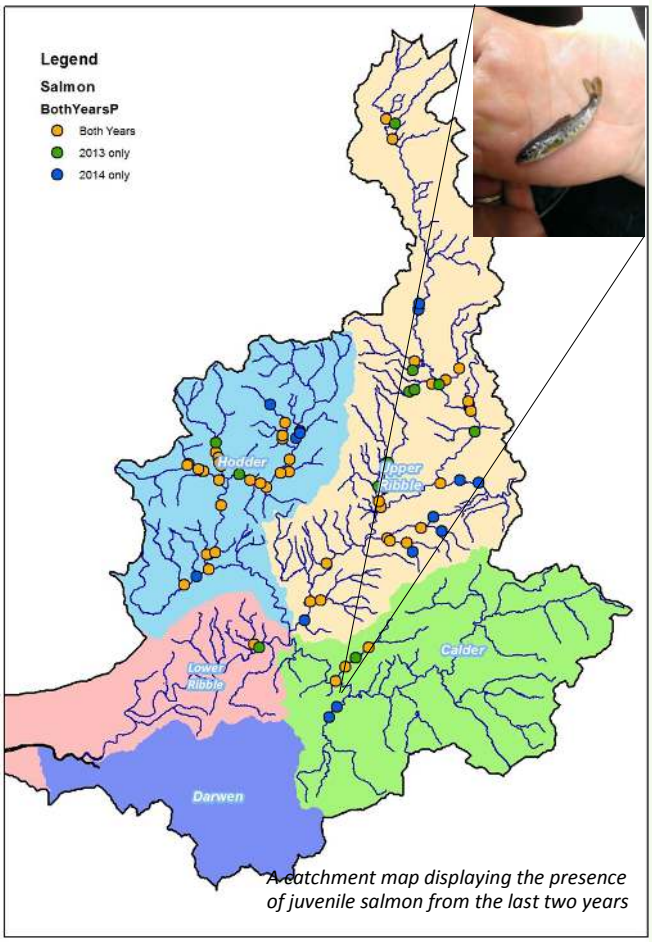
2014 represents the final year of our salmon tracking project and there has been no let up in the pursuit of the tagged fish by our volunteers. This year, 18 salmon were tagged between February and June with three smaller individuals released and two sea trout also captured. Those tagged were smaller in size than those of the previous two years but arrived at the same time of year.

The last of the active monitoring took place at the end of December and the routes of all 62 tagged fish (26, 18 and 18 in consecutive years) are now to be collated and reviewed. The proportion of tagged salmon followed through to spawning was greatest in the final year of the project. Again, the tagged fish have exhibited a consistent behavioural pattern to previous years and a preference for main river spawning. Only a single tagged fish was observed spawning in a tributary in 2014. A meeting of the project team early in 2015 will decide what outputs from the study are to follow.

The second year's results have provided further drivers that have resulted in habitat improvements along Ged Beck and Twyn Ghyll during the course of 2014. Undoubtedly, the outcomes from the final year will also contribute towards further practical works whilst improving our knowledge base for future management purposes. The encouraging results from our 2014 electrofishing surveys give hope for future salmon runs. Thank you to all the volunteers who gave up so much of their time to contribute to the study.

One of our hardy volunteer trackers out on a windswept Long Preston flood plain

Salmon storm the Calder



A catchment map displaying the presence of juvenile salmon from the last two years

Fisheries Scientist Gareth Jones comments on new locations of salmon found during 2014's surveys.

In summer 2014, a series of very exciting findings were made relating to the whereabouts of our catchment's salmon. Perhaps most significantly, my first juvenile salmon discoveries upon the River Hyndburn were made. Both fry and parr were located within two sites on the lower end of the river below Oakenshaw weir in Clayton Le Moors. This was a particularly rewarding result as local residents that have campaigned tirelessly for water quality improvements were on hand to witness the findings. The observation corresponds with the first discovery of a trout fry on Great Harwood Brook. Targeted work to capitalise upon this discovery is envisaged with the prospect of extending their range further towards Accrington.

The dispersal of juvenile salmon was not just confined to the River Hyndburn, with the Environment Agency identifying a salmon fry further along the main river Calder. This was a major success story for both the Ribble Trust and EA following the removal of the weir next to the old Padiham power station. As the removal of barriers has continued, it is now possible for salmon to ascend the town centres of Barrowford, Burnley and Colne. With their desire to travel further along the Calder now confirmed, who knows where we will encounter young salmon in 2015!

Salmon parr were also found further along the mid-Ribble tributaries of Stock Beck, Howgill and Barrow Brook.

> "Who knows where we will encounter young salmon in 2015!"

Ribble Trust has completed habitat improvements upon each whilst installing three easements along Swanside Beck (which leads to Howgill). The presence of salmon parr above the third easement on Howgill demonstrates that a further 1.4 km of rearing and spawning habitat is now being utilised. Previously this reach would have been cut off to migratory salmon.

One of a number of cracking salmon parr seen during a good developmental year

Parr are highly territorial creatures and their wider dispersal along the river increases their chances of survival. With more parr existing in previously inaccessible areas of the catchment, their increased presence should translate to greater numbers leaving the Ribble as smolts.

The persistence of fry and parr within reaches carrying urban run-off with a heavy silt load has also been encouraging. In addition to our discoveries upon the Calder catchment, small juvenile populations continue to persevere along the tributaries flowing through and around Clitheroe. Salmon parr too have had a good developmental year and have been on average longer in length than in 2013, which is a genuine cause for optimism because larger smolts have better chances of survival. By improving and increasing the availability of habitat to support the freshwater phase of their lifecycle, we are promoting their chances of survival as they head to sea.

Biosecurity

Invasive species can adversely affect fish and other wildlife and are costly to manage. Invasive Species Officer, **Adam Walmsley** explains why we should all do our bit to protect the rivers we love.

Unlike pollution which dissipates over time, invasive non-native species can cause **permanent, irreversible** damage to an ecosystem. From Himalayan balsam seeds stuck in the tread of your boots, to the transfer of crayfish plague that can decimate a stronghold of native white claw crayfish, it is far too easy for people to unwittingly damage an ecosystem. Please do your bit to ensure you don't inadvertently spread these species to, from, or within the Ribble catchment.

In the Ribble catchment we work hard to tackle invasive species like Himalayan balsam and giant hogweed with the invaluable help of many volunteers. But there are many more species out there that aren't yet present in the catchment and could pose an even greater threat to the Ribble. As people who love rivers and visit them on a regular basis, we are potentially a major vector for aquatic invasive species. These organisms are experts at hitchhiking on boots, clothing and equipment in order to find new habitats to invade. It's up to all of us to make sure we aren't giving these species a free ride by inadvertently transferring them between waterbodies. Fortunately there are some simple precautions we can take which reduce this risk dramatically;

Killer Shrimp
First found in the UK in 2010. A voracious invertebrate predator which preys on other invertebrates, fish eggs and small fish. A close relative, the Demon Shrimp, has recently been found in the River Douglas.

Matt Brazier

Signal Crayfish
Outcompetes the endangered native white-clawed crayfish and carries the crayfish plague which decimates white-clawed populations. Both species are found in the Ribble. Signal crayfish also predate juvenile fish.

David Aldridge

Quagga Mussel
A filter feeding mollusc which can cause a major shift in freshwater algal and zooplankton communities. First discovered in the UK in October 2014, it outcompetes the invasive zebra mussel which is already present.

Check all clothing, footwear and equipment for visible debris or organisms, particularly seams, treads and seals of boots. Remove debris and leave at the waterbody where it was found.

Clean all clothing, footwear and equipment thoroughly. Equipment and boots can be cleaned using first a hose and then dipping them into a disinfectant solution (e.g. Virkon®, available at farm stores or online). This will kill diseases but not invasive species.

Dry all clothing and equipment thoroughly. Equipment should be dry for at least 48 hours before it is used elsewhere, as invasive species can survive for up to 2 days even in dry conditions. Do not transfer water elsewhere. For more info visit: www.nonnativespecies.org/checkcleandry

Wetlands

Constructing wetlands or 'scrapes' on floodplains can provide various benefits to the environment. One of the main benefits is their ability to filter pollutants from overland flow using natural processes. During high rainfall events, slurry, topsoil and nutrients can be washed off agricultural land into rivers and streams, having detrimental effects on water quality and aquatic wildlife. An excess of nutrients in rivers can lead to algal blooms, depriving the water of oxygen and resulting in fish kills. Too much sediment in rivers can smother and destroy fish eggs , while the input of faecal matter can reduce the water quality to such a degree that bathing waters along the coast become unsafe for recreational activities.

By constructing wetlands on floodplains, runoff rates are slowed and many of the suspended solids become trapped by the vegetation and settle out, while other pollutants are absorbed by the vegetation. Wetlands also provide suitable conditions for microorganisms to exist, which further increases their ability to remove pollutants from the water.

Another benefit of constructing wetlands on floodplains is the additional habitat they provide, increasing the diversity of plant species and attracting different types of wildlife such as dragonflies, frogs, newts, wildfowl and wading birds.

Furthermore, the presence of scrapes gives the land increased capacity to store water. As our climate changes, we expect intense rainfall events to occur more frequently. These events are responsible for flooding because the rain falls so intensely over such a short period of time that is unable to adequately soak into the soil. As a result, it flows rapidly across the land and into rivers, generating a flash flood. By constructing attenuation features such as scrapes, rainfall can be intercepted, stored and released more gradually into rivers, reducing the likelihood of flash flooding.

Other water attenuation features, such as 'leaky dams', are being trialled around the country, as the issue of flooding is becoming increasingly pertinent to the lives and livelihoods of people living near rivers. Such 'soft engineered' solutions are far more cost effective than constructing flood walls and they have the added benefit of improving biodiversity.

A leaky dam in the Belford Catchment, Northumberland

Ribble Trust has constructed two wetlands to date, one adjacent to the River Ribble at Stainforth and another with the Environment Agency at Trout Beck near Settle. Under the new Countryside Stewardship scheme, farmers and land managers are expected to be offered payments for the creation of wetlands and the Trust hopes to aid with the construction of more of these features in the future.

Constructed wetland - Trout Beck near Settle

European Eel

Anguilla anguilla

Lifecycle

The European eel arguably has the most fascinating life of all our riverine species. They begin their lives in the Sargasso Sea in the middle of the North Atlantic and they drift across to Europe on the Gulf Stream as larvae, a remarkable journey lasting 1-2 years and covering a distance of up to 6,000 kilometres. When they arrive at our estuaries, we find them in their 'glass eel' stage. As they grow into elvers, some eels begin to migrate up our rivers and can live for 6 - 20 years in freshwater. When the time comes, adult eels make the long journey back to the Sargasso Sea to spawn.

Glass eels (image: Sustainable Eel Group)

Endangered?

It is deflating to concede that after such an epic journey to reach our rivers, juvenile eels face a raft of issues that threaten their survival. According to the International Council for Exploration of the Seas (ICES), the arrival of eels on European shores has declined by 99% since the 1980s, placing them on the critically endangered list. There is no sole explanation for this dramatic decline, but possible causes include overfishing, parasites, barriers to migration (weirs, hydroelectric dams), pollution, lack of habitat and changes to the Gulf Stream.

Adult eel traversing riverbank

Conservation

In 2007 the European Union adopted measures to aid in the recovery of eel stocks. National eel management plans were adopted, with proposed actions including;

- Limiting fisheries
- Removal of barriers to upstream migration
- Restocking juveniles in inland waters

Annual electrofishing in the Ribble Catchment indicates that eel populations are good, except for in some of the upper extremities of the catchment where their upstream migration is blocked by weirs.

In recent years, Ribble Trust has worked with the Environment Agency to install eel passes on several large weirs, including the River Ribble near Clitheroe, Croasdale Beck near Slaidburn, the upper Ribble at Settle and Langcliffe and the River Brun.

Eel passes are relatively simple arrangements, resembling a wide drainpipe containing bristles not dissimilar to an upturned brush. A flow of water permeates through the bristles, allowing juvenile eels to wriggle their way through and bypass the weir.

Ribble Trust cannot control changes at sea which may affect breeding rates of eels, but we can strive to ensure that when eels arrive in our rivers, they have suitable habitat and good water quality, and so we hope to undertake more of this work in the future.

FACT FILE

- **Lifespan:** Up to 80 years
- **Size:** Up to 130cm, average adult 60 - 80cm
- **Diet:** invertebrates and small fish
- **Range:** Up to 12,000km from Sargasso Sea to Europe and back.
- **Reproduction:** one female can produce over 1 million eggs (owing to high juvenile mortality rates)
- **Habitat:** varied - coastal waters, estuaries, rivers. Often burrow into loose substrate and frequently leave the water to traverse riverbanks.

Installing an eel pass on Settle Weir, River Ribble

Help improve your local rivers

Volunteer with us!

The Ribble Trust started life as a group of volunteers and they've been integral to our delivery of habitat improvements ever since. There's no way we could make as big an impact without them.

We work all over the Ribble Catchment so chances are there'll be volunteering opportunities near you. No experience is necessary as full training and equipment is provided prior to the activity.

Already our volunteers have helped to improve our rivers for the future, but there's always plenty more to do and we need **YOUR** help to do it!

From tree planting, fencing and wildlife surveys, to litter picks and invasive species control, we offer a range of opportunities to suit energetic, hard-working volunteers who love the outdoors and want to make a difference to their local environment.

Anyone can get involved, from families and individuals, to colleges and local businesses. We even offer corporate team away-days, which are great for teamwork and enjoying time out of the office.

Join the mailing list to receive all the details on upcoming volunteer events, just email your request to admin@ribbletrust.com

Check the website for updates: www.ribbletrust.org.uk/volunteering

Follow us on Facebook - www.facebook.com/RibbleTrust

"Volunteering is a fantastic way to see and help wildlife. You can learn new skills, meet new people and it looks good on a CV! A great sense a satisfaction comes from volunteering and seeing a job well done."

No time to volunteer?

Donate and help us plant more trees by texting

TREE26 £2 / £5 / £10

to **70070**

Once again, thank you to all of our members, volunteers, supporters and funders who have helped keep us going over the years. Together, we're making the Ribble Catchment a better place to live for wildlife and people.

Hanson HEIDELBERGCEMENT Group

heritage lottery fund LOTTERY FUNDED

Environment Agency

Department for Environment Food & Rural Affairs

United Utilities helping life flow smoothly

NATURAL ENGLAND

A clear solution for farmers CATCHMENT SENSITIVE FARMING

SITA trust

WOODLAND TRUST

THE RIVERS TRUST where there's water there's life The new name for the Association of Rivers Trusts

Forestry Commission

Durham University

Membership Form

As a charity, we rely entirely on membership fees, donations and grants to continue the vital conservation of our rivers. If you love nature and would like to make a difference, please join us.

STEP 1: Your details

Title _____ Forename(s) _____ Surname _____

Address _____

_____ Postcode _____

Phone number _____ Email _____

STEP 2: Choose your payment

Your membership subscription is a donation towards our work. The more you can afford to give, the more we can do to improve our rivers.

Annual membership: £20 ❑ **(or £5 per quarter)**

or your own amount **£**_____

Life membership: £250 ❑

or your own amount **£**_____

STEP 3: *giftaid it* at no extra cost to you

For every £1 we receive, we can recover an extra 25p from HM Revenue & Customs.

❑ Yes I want to Gift Aid it ❑ Non-taxpayer and cannot Gift Aid

Name: _____ Signature: _____

You must pay an amount of Income Tax and/or Capital Gains Tax for each tax year (6 April to 5 April) that is at least equal to the amount of tax that all Charities and Community Amateur Sports Clubs will reclaim on your gifts for that tax year. Other taxes such as VAT and Council Tax do not qualify.

STEP 4: Select payment method

❑ **Cheque/cash** - please make cheques payable to 'Ribble Catchment Conservation Trust Ltd.'

❑ **Banker's order** - please fill in your bank details below.

Bank/building society name: _____

Branch address: _____

_____ Postcode: _____

Sort code: ____/____/____ Account no: _____

Please pay *Ribble Catchment Conservation Trust Ltd.* £ _____

Starting on _____ and thereafter quarterly/annually (delete as appropriate).

Signature:

Date:

Full name: _____

Address: _____

_____ Postcode: _____

Instructions to bank/building society

Account name: Ribble Catchment Conservation Trust Ltd.

Sort code: 16-29-34

Account no: 10046013

Address: Royal Bank of Scotland plc, The Butts, Rochdale, Lancashire

Postcode: OL16 1EJ

Please return completed membership forms with payment to;

Ribble Rivers Trust, c/o Hanson Cement, Ribblesdale Works, Clitheroe, Lancashire, BB7 4QF.

Why not join online? Visit www.ribbletrust.org.uk/membership

Help secure a better future for rivers and wildlife

Become a member

Our members secure our very existence. The income we generate from membership is the foundation upon which we can apply for much needed grants to continue our work.

By becoming a member of the Ribble Rivers Trust, you'll be helping us protect and improve our rivers for the benefit of wildlife and people for generations to come.

Complete and return the membership form overleaf

As a member you will receive;

- Annual newsletter
- Mid-year e-newsletter
- Water Friendly Homes guide
- Membership card
- Member discounts
- Car window sticker

Membership £20 per year

Photo: Rod Calbrade