Fisheries Annual Report 2017 to 2018
West Midlands

We are the Environment Agency. We protect and improve the environment.

We help people and wildlife adapt to climate change and reduce its impacts, including flooding, drought, sea level rise and coastal erosion.

We improve the quality of our water, land and air by tackling pollution. We work with businesses to help them comply with environmental regulations. A healthy and diverse environment enhances people's lives and contributes to economic growth.

We can't do this alone. We work as part of the Defra group (Department for Environment, Food & Rural Affairs), with the rest of government, local councils, businesses, civil society groups and local communities to create a better place for people and wildlife.

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Foreword

In each of our 14 areas we carry out a wide range of work in order to protect and improve fisheries. Below are some examples of what has been happening in the West Midlands (WMD) Area, much of which benefits fisheries from funding from both fishing licence fees and other sources. For a wider view of the work we do across the country for fisheries please see the national Annual Fisheries Report.

Contents

1. Fishing licence checks and prosecutions

During the 2017 to 2018 financial year (the last complete year of data) a total of 64,702 fishing licence checks were carried out by our fisheries enforcement staff across the country. Our checks show us that evasion was relatively low with a national average of 3.97%. Below are details from WMD:

145,413 rod licences sold

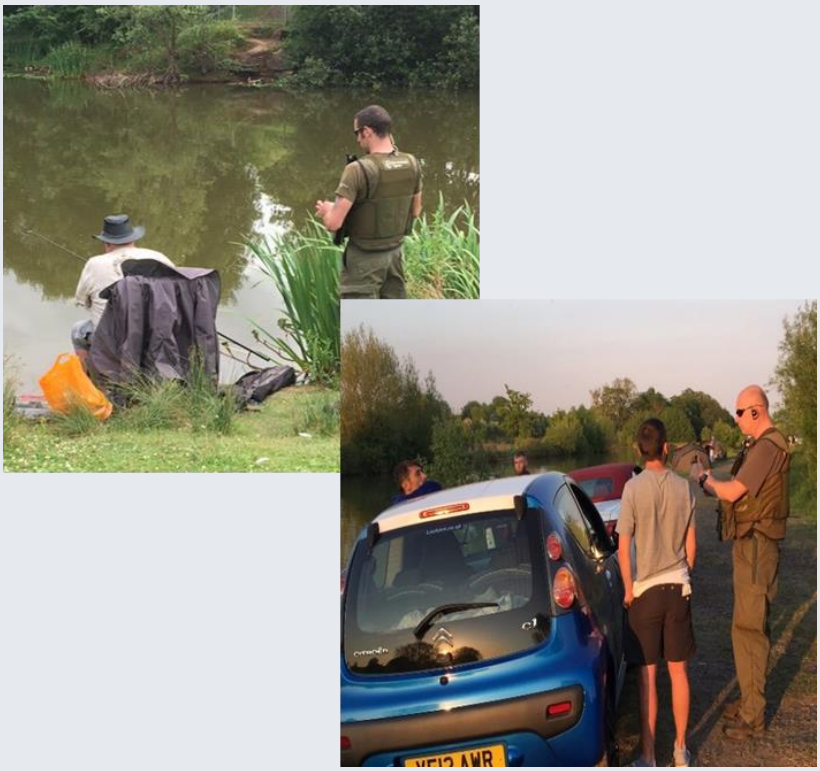
£3,100,173.25 income generated from rod licence sales

8707 rod licences checked

378 successful prosecutions

£62,190 fines and costs imposed

Fishing licence checks and prosecutions



Fishing licences checks on a still water in West Midlands

Illegal fishing

Boat patrols are an important part of the fisheries enforcement arsenal, by using our patrol boat we are able to effectively police both banks of the navigable rivers we have in the area, namely the Severn and Avon. It also allows officers to access areas that are out of the way or inaccessible from the bank and to check other boat users. In 2017 we undertook 21 boat patrols resulting in several offences including fish removal and fish theft.

Boat patrol on the River Severn

2. Illegal fishing

Illegal fishing remains a threat to game and coarse fish stocks in England and the fisheries they support. The Environment Agency uses a combination of covert and overt patrols to deter and detect poachers, as well as responding to reports of illegal fishing where there is a credible threat to fish stocks and where we have a realistic chance of apprehending the alleged offenders. We cannot respond to every report of illegal fishing so we must prioritise where we focus our efforts.

347 illegal fishing incidents were reported to our incident hotline (0800 80 70 60)

Foul hook

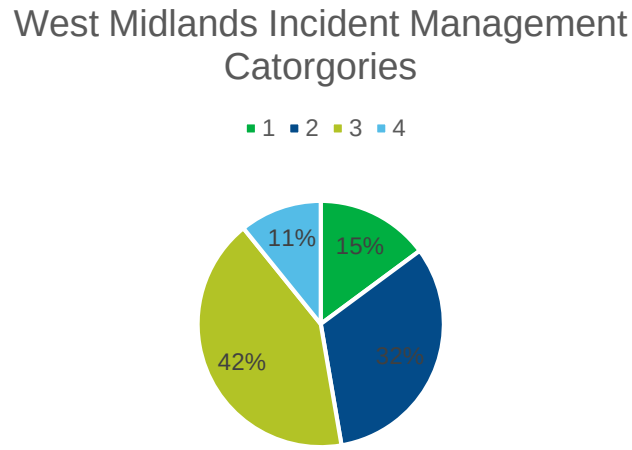
This hook and attached weight is known as a "snatcher" which it is cast out using a fishing rod with heavy line, allowed to sink and then struck back in hope of foul hooking salmon or large coarse fish. This was found on a river in the catchment at a weir were salmon can be delayed during their upstream migration. Reports of this type of poaching activity and the physical evidence enable intelligence lead operations and patrolling which are known deter illegal fishing activities. No subjects were identified in this case.

Illegal treble hook found by bailiffs on a riverbank

3. Incident management

Responding to fish kills and other environmental incidents is a vitally important part of what we do. We respond to thousands of substantiated incidents annually. Members of the public report incidents through our Incident Hotline (0800 80 70 60) and we are able to respond 365 days a year and on any day, at any time, providing an effective and proportionate response.

All incidents are categorised according to potential and actual impact on the environment and the impact on our resources. We can then break this figure down into categories of incident as shown below. Category 1 is the most serious and Category 4 is a reported incident with no impact.



Incident calls and theft of fish

We aim to attend as many incident calls as possible. In 2017 to 2018, this averaged 10 callouts every week, most of which occurred during anti-social hours and weekends. The majority of incident calls are related to the fish removal or theft and mostly involve the taking of coarse fish with rod and line or illegal set line fishing.

Fisheries enforcement officers responding to a reported incident.

Illegal gill nets

We have seen an increase in the use of illegal gill nets, especially on the River Wye where we have had 12 reports of nets being used to target both salmon and coarse fish. Such nets do massive damage to the amenity value of the beat where they are set and often catch birds and mammals as well.

Examples of seized fishing equipment and illegal activity

A salmon caught in an illegal gill net being retrieved by our officers

Offences with high fines

George Holland from Stafford was fined £1800 for no licence and obstruction of constable and using threatening, abusive or insulting words or behaviour causing that person to believe that imminent violence will be used against him at Issak Walton fishery.

At the Ripple Fishery which is an EA owned water Greg Hensaw of Birmingham was reported and fined £2416 for multiple offences including close season fishing and obstruction of officers. Henshaw was arrested on site by our officers for failing to provide his name and address.

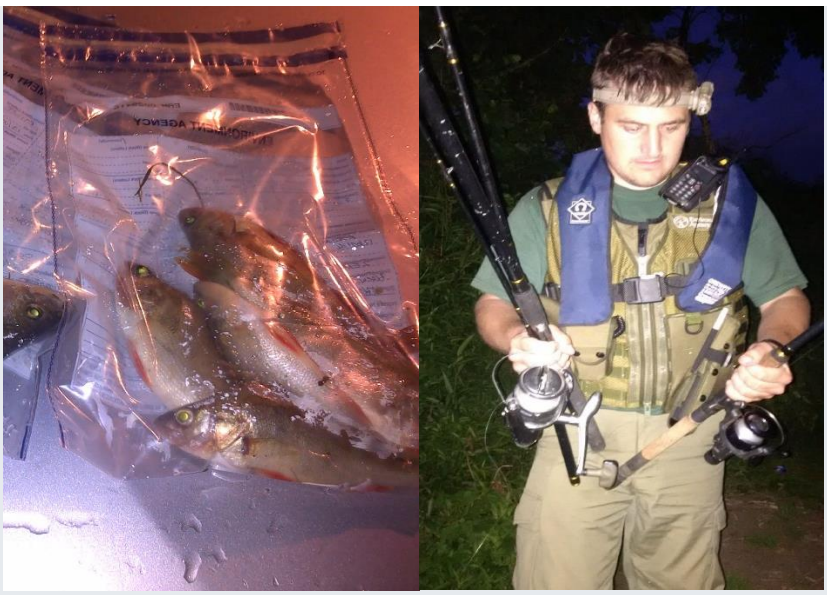
Partnership

In addition to our high level of incident callouts, we also ran several operations including Operation Leviathan which is a multi-agency operation linking in with Angling Trust and local police with the aim of reducing illegal fishing and fish theft across several areas. We conducted 10 of these across the west midlands patch with the majority being in Warwickshire / Leicestershire area and several in the Gloucester Area.

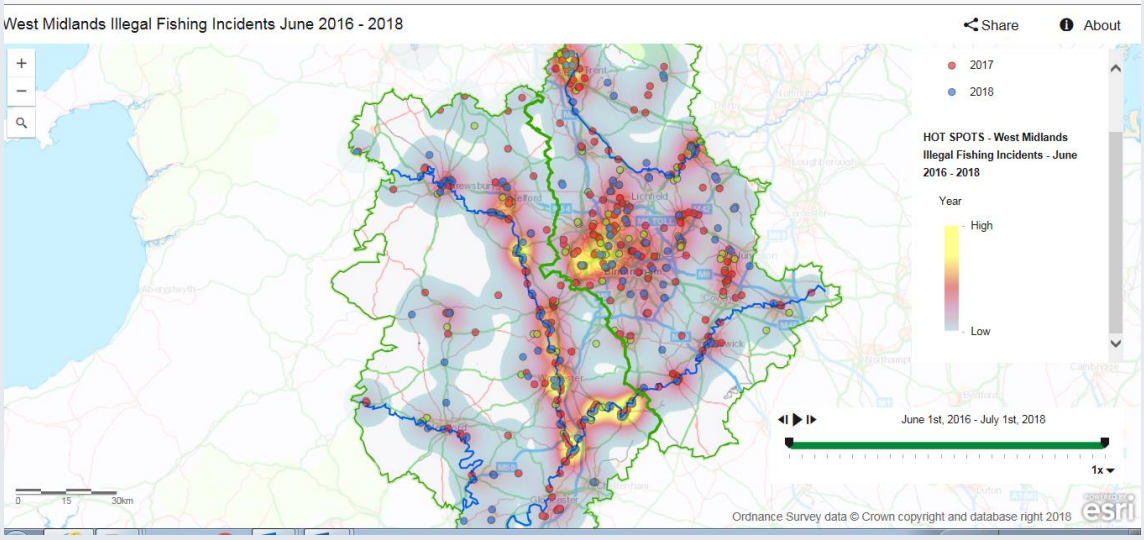
Operation Leviathan: multi agency approach tackling illegal fishing and fish theft

Operation Stone

Operation Stone was set up five years ago to tackle fish removal across several hotspot areas of the rivers Seven and Avon. Intelligence we gather during our patrols and from reports is used to plot a “heat map” of high risk areas which we refer to as Fish Theft Areas (FTAs)– these FTAs are patrolled in a semi-covert way during peak periods which is usually Friday to Sunday nights during the summer months to help deter offending at these spots. Fish removal is a massive reputational issue for the Environment Agency and the publicity we get from Operation Stone is evidence of how strong the feeling of fish removal is with our licence paying customers.



Evidence gathered during operation stone

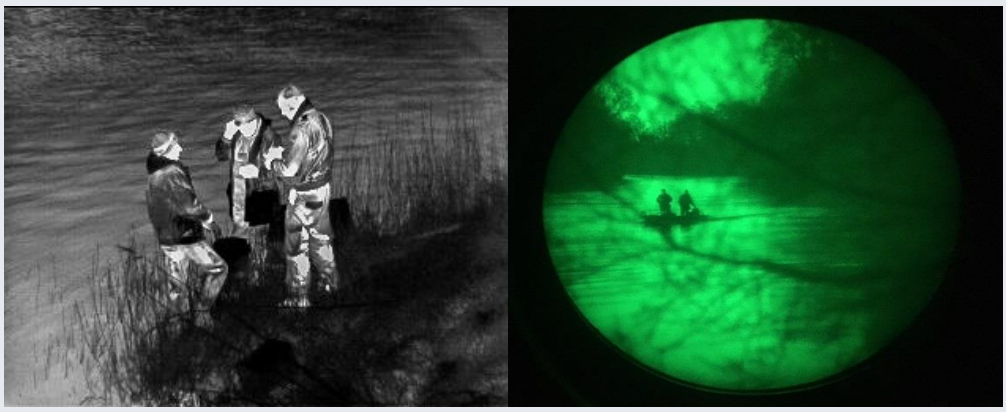


Operation Stone: heat map of Fish Theft Areas (FTAs)

Elver enforcement

Regulation and enforcement of the elver fishery contributes to a significant workload for fisheries enforcement team from February to May each year. In 2017 officers ran active operations and patrols over 51 nights of the season. Our emphasis is on intelligence gathering during those patrols where we work closely as a multi-agency group alongside local law enforcement, national wildlife crime officers, CEFAS and Border Force. Our

aim is to achieve fisheries compliance with all licenced fishermen and dealers, most importantly prevent the illegal trade in the export of elvers out of the country.



Pictures taken during elver enforcement

Salmon patrol

During late autumn early winter fisheries enforcement officers conduct salmon protection patrols throughout the Severn catchment. We monitor the numbers and progress of the fish as they migrate upstream to their spawning grounds. Day and night patrols are undertaken to deter poachers, particularly during low flow periods where salmon delayed at significant barriers to migration such as weirs.

Fisheries officer and a bailiff watching the salmon run on the River Teme, Ludlow

River Teme fish rescues

Some of the upper catchment watercourses can experience extreme low flow events as a result of periods of prolonged dry weather. This can be so be so severe the surface water flow disappears beneath the gravel bed and sections of the river dry out. Fisheries staff had been monitoring the levels in the River Teme in Herefordshire and swiftly rescued fish that were stranded in pools and narrow channels. Over a fortnight period in July hundreds of salmon parr (juveniles) and adult trout were rescued and relocated into flowing sections of the river downstream. Once flows return, a network of improved fish passage at significant barriers will allow fish to repopulate the previously dry sections river. Redd counting was undertaken in December and least 20 redds (nests) were counted which shows salmon had returned and successfully spawned.

Fisheries officer holding a rescued 3lb brown trout prior to release in deeper water

River Redlake fish and crayfish rescues

In early July a member of the public reported that a section of the River Redlake in south Shropshire had dried up. Fisheries staff responded quickly to the incident and worked with Monitoring Team staff to rescue 270 fish from the village of Bucknell. As the sections of water dried up, native white clawed crayfish were exposed. Staff from Natural England worked with Fisheries, Biodiversity and Geomorphology staff to capture 100 crayfish and relocate them to sections of deeper flows downstream. The crayfish, which are now classified as an endangered species, were found in surprisingly large numbers huddled together in damp patches below the cobbles.

Natural England staff collecting native white clawed crayfish from under damp stones

River Dore fish rescues

The prolonged dry weather continued into the autumn triggering further exceptional low flow incidents, this time on the River Dore in Peterchurch, Herefordshire where officers from fisheries and monitoring teams spent 4 days in early October rescuing over 450 juvenile and adult brown trout, several eels and lamprey from various sections of the River Dore as it shrunk in size seemingly overnight reducing to a trickle, then a series of ponded oxygen depleted sections before drying up completely.

The fish were rescued using electric fishing equipment, carefully netted and transported in oxygenated tanks of water. The fish were released further downstream in sections of river with deeper flowing sections and improved higher levels of dissolved oxygen. Fisheries Officers worked with local landowners, the public and the Monnow Rivers Association to publicise their incident response work, educate people on the signs of fish in distress and to how to report incidents to reduce significant ecological impacts. Some fish had perished due to the low dissolved oxygen levels and opportunistic predation, although significantly more were rescued.

Rescuing fish in very low flows and releasing brown trout and eels in deeper water

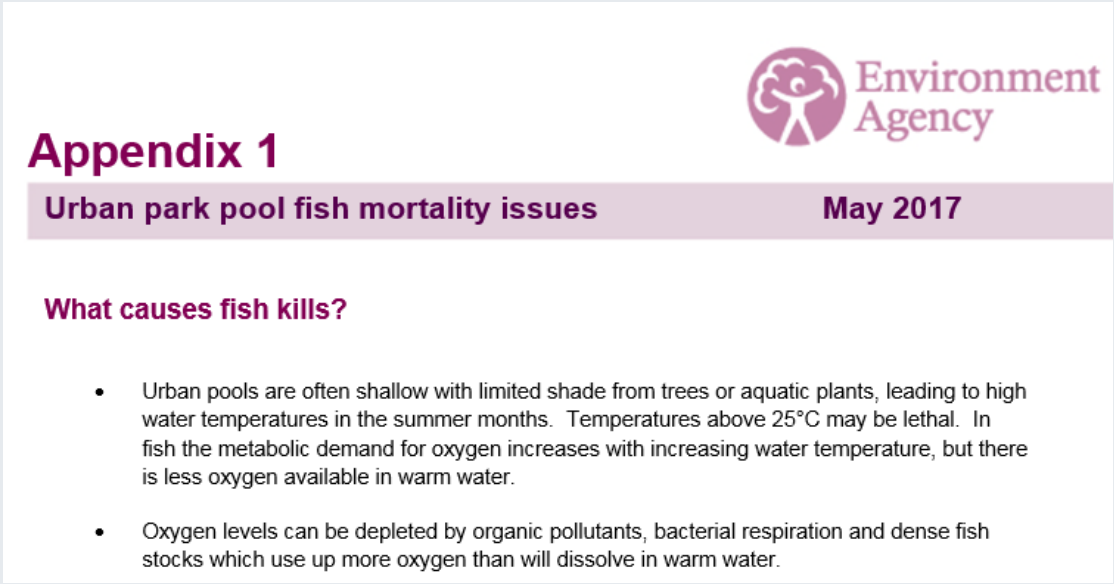
Shropshire Brook, Cannock Chase SSSI crayfish rescue

In May 2017 we received reports of the Shropshire brook drying out which holds a number of native crayfish. The brook runs through Cannock Chase SSSI/SAC and is an important area for nature conservation. In addition to over 60 native crayfish, also fish species such as trout, minnow and stickleback were affected. We attended the incident and were able to rescue several crayfish and move them to a part of the brook which was still flowing. We worked together with our colleagues to establish the reason for the brook drying up and preventing it from happening again.

Cannock Chase SSSI and some of the crayfish that were rescued

Fish kills

It's not just rivers that suffered in the hot summer months. Each year we write to local authorities advising them of the risk to their fish stocks due to high water temperatures and low dissolved oxygen levels.



Environment Agency

Appendix 1

Urban park pool fish mortality issues **May 2017**

What causes fish kills?

- Urban pools are often shallow with limited shade from trees or aquatic plants, leading to high water temperatures in the summer months. Temperatures above 25°C may be lethal. In fish the metabolic demand for oxygen increases with increasing water temperature, but there is less oxygen available in warm water.
- Oxygen levels can be depleted by organic pollutants, bacterial respiration and dense fish stocks which use up more oxygen than will dissolve in warm water.

An example of the guidance we issued in 2017 to 2018

Fisheries Officers regularly advise on appropriate mitigation and responded to incidents, one example being Leegomery Pool in Telford. The area officer responded to reports of fish in distress and pumps were deployed to increase aeration. Our response prompted positive feedback from the angling club and encouraged them to put in place their own fisheries management plan which included buying their own aeration equipment.


One of 60 dead mirror carp in a Shropshire still water and aeration at Leegomery Pool, Telford

Smiths Pool, Stoke on Trent

Reports of fish in distress at Smith pool, near Stoke prompted an immediate response from Environment and Fisheries Officers. Upon arrival fish were gasping all around the pool and dissolved oxygen levels of 1.7 mg/l were recorded. The decision was taken to deploy aeration equipment throughout the pool.

In addition to our own aeration, we were able to make contact with the local fire brigade who took the opportunity to test out some of their pumps and in doing so, help aerate the water. Unfortunately, a number of fish died, but we were able to save many more by deploying aeration equipment.



Deploying aeration equipment

River Leadon, Herefordshire & Gloucestershire prosecution

In July 2016 the River Leadon and one of its' tributaries, the Preston Brook, suffered from a severe pollution event caused by hundreds of tonnes of digestate which killed all the invertebrates and approximately 15,000 fish (chub, roach, dace, brown trout, eels, lamprey, bream and pike and minor species such as bullhead, minnow and stoneloach) in a 14km stretch from Dymock to Upleadon. In November 2017, the offenders were fined a total of £62,000 at Hereford Magistrates Court representing the major impact the pollution had on the surrounding environment. It was the worst environmental disaster in the area for 10 years.

The digestate pouring off the field into the Preston Brook and a selection of dead fish

To replace the fish that were killed, a 4 year re-stocking programme has been established with fish being provided by the rod-licence funded Environment Agency fish farm at Calverton in Nottinghamshire. A total of 92,750 fish will be re-stocked, consisting of 42,875 chub, 34,125 dace and 15,750 roach. All fish will be 1+ year class and stocked at stretches fished by Gloucester Angling Club. Stocking started in 2016 and will be reduced annually. After the fourth year fish will be mature and there will be adequate recruitment to ensure populations will be self-sustaining.

Fisheries Officer stocking chub on a Gloucester Angling Club stretch

Laughern Brook pollution incident, Worcestershire

In September the Laughern Brook, Worcester was subject to a large pollution event, the second such incident in two years. Approximately 5km of watercourse was affected. The fish species that had naturally re-colonised from the previous pollution were hit the hardest and over 120 fish consisting of dace, gudgeon and brown trout were killed. EA Environment officers conducted an investigation and the source of the pollution was identified and contained. Monitoring officers investigated the impact on the invertebrate life by undertaking kick samples and found both live and dead invertebrates.

Fisheries officer taking water quality readings

Fisheries officers responded to the incident by undertaking water quality readings and identifying the 'plume' of pollution as it moved downstream. Hundreds of coarse fish were observed by fisheries officers gasping at the surface of the brook. A rapid deployment of hydrogen peroxide was decided upon as the best course of action as the dissolved oxygen levels had plummeted. Operations staff established 3 sites where hydrogen peroxide was pumped into the water, in one area with a large population of coarse fish in and a second where there were brown trout and a third with mixed fish populations. Within a short period of time the dissolved oxygen level had been raised from a critical 5% to a life sustaining 60%. Pumping continued for 2 days and helped to save the remaining fish populations that had survived the pollution. Fisheries officers walked sections of the brook and undertook a comprehensive fish mortality investigation. A legal investigation is currently underway.

Fisheries officer identifying dead fish .

4 Fisheries improvements

The boxes below highlight some projects we have delivered followed by the table below listing many of our environmental improvement projects that have helped to deliver benefits to fisheries; many in conjunction with our partners. We have included the time of our fisheries officers in the funding considerations for the projects as their posts are funded by fishing licence income. Considerable amounts of their time and expertise has been provided for the projects. Many projects have also received funding from government or from other parts of the Environment Agency e.g. flooding, the Environment Programme or Water Framework Directive budgets however where contribution has included fishing licence income, this has been noted.

£326,950 + **£307,650** = **£726,100**

EA Funding | Match Funding | Fisheries Improvements

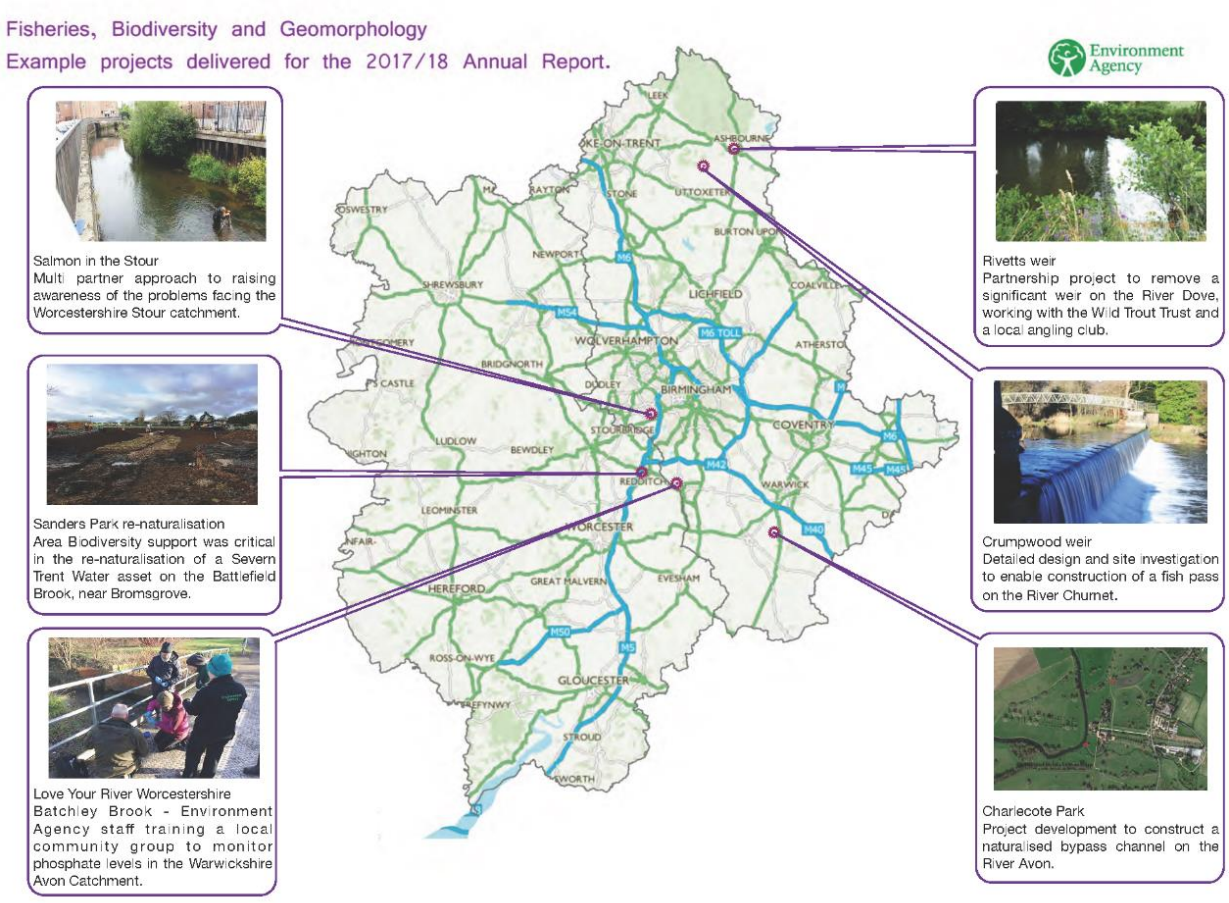
Project Title	Outcome or benefit	Partners	EA funding (£)	Match funding (£)	Total Cost (£)
Charlecote Park bypass channel	Ground Investigation to inform a final design for fish passage at Charlecote Park cascade weir (River Avon)	National Trust	£10,000		£10,000
Crumpwood Fish Pass Project	Fish pass feasibility and design of larinier fish pass under historic groundwater pumping station	South Staffs Water, Lichfield Water Works Trust, Caldon and Uttoxeter Canal Trust, Staffordshire Wildlife Trust, Wild Trout Trust, Grayling Society, Fenton and District Angling Society, Dove Valley Anglers, JCB Angling Club	£15,000	£74,950	£89,950
Rivetts Weir Removal	Fish migration and	Wild Trout Trust,	£15,000	£15,000	£30,000

	improvements in fish habitat	Birdsgrove Fly Fishing Club			
Re-connecting Woodgate Valley (Phase 4)	Four weirs removed to improve fish migration and morphological connectivity	Birmingham City Council, Woodgate Valley Rangers	£27,000	£1,700	£28,700
Salmon in the Stour (headwaters to confluence)	Catchment scale restoration on the Worcestershire Stour to improve water quality, habitat and fish passage.	Wildlife Trust for Birmingham & the Black Country, Worcestershire Wildlife Trust, Severn Rivers Trust	£64,950	£20,500	£85,450
The Dream Tean	Working with farmers to remove large sections of hard bank revetment. Replaced with root plates to provide stability and fish habitat.	Wild Trout Trust	£10,000	£80,000	£90,000
West Mids Eel traps	Refurbishment of two eel traps (one Humber catchment one Severn catchment), to enable enumeration of adult eels leaving the river catchments in West Midlands.	Multiple private landowners, Warwick Castle - Merlin entertainments	£15,000	£5,000	£20,000
River Alne catchment restoration project	Extensive walkover surveys identified multiple habitat improvement opportunities; livestock exclusion, fencing, tree planting. Project workshops with	Severn Rivers Trust, River Alne Consultative (multiple angling clubs)	£10,000	£10,000	£20,000

	the River Alne consultative enabled delivery on the ground				
Abbeydale weir removal (River Arrow)	Detailed design and hydraulic modelling commission to enable removal of Abbeydale weir (River Arrow) in 2018/19.	Redditch Borough Council, North Worcestershire Water Management	£10,000	£22,500	£32,500
Love Your River Worcestershire	Community engagement and phosphate monitoring in the Batchley Brook / detailed designs for fish passage and hydraulic modelling for habitat re-connection on the Red Ditch and the River Arrow.	Redditch Borough Council, North Worcestershire Water Management, Worcestershire Wildlife Trust	£30,000	£1,000	£31,000
Bentley Brook catchment restoration project	Fish passage and habitat improvements using the SNIFFER low cost barriers assessment methodology.	Wild Trout Trust	£20,000	£2,500	£22,500
Sanders Park re-naturalisation (Battlefield Brook)	Part of Severn Trent Waters AMP work; removal of concrete lined channel (0.4km), meander introduction and planting.	Seven Trent Water	N/A	N/A	N/A
Unmuddying the waters	Multiple weir removals and habitat interventions	Severn Rivers Trust, Shropshire Hills AONB,	£95,000	£74,500	£169,500

	(fencing, buffer strips and tree planting)	Woodland Trust			
Severn & Wye tool bank	Provision of hand tools and equipment to local groups (with an approved management plan) to enable small scale habitat improvement works alongside rivers and on wetlands.	Severn Rivers Trust, Wye & Usk Foundation, Stroud Valleys Project, Wyre Forest District Council	£9,500	£1,000	£10,500
River Worfe habitat improvement project	Catchment based approach to habitat improvements to benefit priority fish species.	Severn Rivers Trust	£17,000	£17,000	£34,000
Wye & Lugg coarse fishery habitat improvement project	Strategic assessment of riparian and in-stream habitat and targeted fish surveys to inform a programme of restoration measures within a SAC.	Wye & Usk Foundation	£20,000	£7,000	£27,000
Severn Basin predator study	Angler led sampling programme in the Severn basin for pike and zander to better understand populations, fish movement and age ranges.	Severn Rivers Trust, Bournemouth University	£5,000	£19,000	£24,000
Total			**£326,950**	**£307,650**	**£726,100**

Selection of Projects



Crumpwood Weir Fish Pass

Crumpwood Weir is a historic weir built in the early 1800`s on the River Churnet in Staffordshire. The weir has been used to both maintain water levels for navigation across the river and to provide a head of water to drive a pumping station. In addition, the weir also forms a significant barrier to the upwards passage of fish (e.g. Atlantic

salmon) within the River Churnet; and making these barriers passable is part of the process of improving the ecological condition of the river.

Crumpwood weir and project information flyers

The Environment Agency have been working closely with partners to design a new fish pass around the weir and to use this as a catalyst for further restoration of the site. The proposed Crumpwood Weir Fish Pass will consist of the installation of a two flight Larinier technical fish pass through the existing pump house, with the resting pool of the pass within the northern pump chamber; and the two flights of the pass being through the pumping station inlet and outlet.

Salmon in the Stour – Headwaters to confluence

River Stour at Weavers Wharf in Kidderminster where habitat restoration is planned

During 2017 we have created a partnership between Environment Agency; Severn Rivers Trust; Birmingham and Black Country Wildlife Trust and Worcestershire Wildlife

Trust. The aim is to raise awareness and promote ownership of the project working across the whole catchment.

Desired work elements over and above improving the passage of salmon through work on weirs include: creation of a clean stream team (identifying and resolving misconnections); community monitoring to tackle water pollution; outdoor classroom sessions to promote river wildlife and how to protect it, business awards to improve the 'blue network', events, use of social media and more. Current and planned EA work will be further enhanced through the group's communication with businesses, schools and communities. In the summer of 2017 the partnership went live at multiple venues throughout the catchment to promote the project to the public and interested stakeholders.

As part of the Salmon in the Stour project, fisheries and catchment co-ordinator staff took invertebrates and fish typical of that which would be expected in the Stour (roach and bream) to Wolverley primary school. Over 80 children were able to view them and had many interesting questions - especially over the lack of eyelids and blinking! This was part of a River Rangers package taught by Worcestershire Wildlife Trust as part of the project. All children have 3 sessions including learning about the River Stour and its catchment; the salmon lifecycle; investigating and visiting a tributary; measuring water quality and talking about pollution; kick sampling for invertebrates and an audit of the school's drains.

Salmon in the Stour project officers at Wolverley Primary School

River Alne catchment restoration project

The River Alne is a historically important fishery within the Warwickshire Avon catchment and is a failing waterbody under the Water Framework Directive. Area fisheries officers identified an opportunity to create the 'River Alne Consultative' which has gathered a member from each fishing club on the Alne to sit on a committee with an aim of airing their concerns and gaining support for proposed habitat improvement projects.

In addition, a partnership was formed with the Severn Rivers Trust to help deliver habitat improvement projects identified after carrying out extensive walkover surveys and in discussions with the angling consultative. Projects delivered ranged from livestock exclusion (fencing) and tree planting to provide green corridors along the river.

Barriers to fish migration on the River Alne and members of the 'AFC'

River Clun weir removal, Shropshire

The Severn Rivers Trust in partnership with the Environment Agency surveyed, planned, and delivered the removal of Oaker weir on the River Clun in September 2017. This historically redundant mill weir has long provided a barrier to fish migration both up the River Clun and the River Kemp and has also modified the natural river habitat both upstream and downstream. FBG staff provided the Trust with key assistance in terms of the Geomorphological Assessment and in submission of the Flood Risk Activity Permit (FRAP) for the weir removal works. Following removal there was evidence of increased Brown Trout redd cutting activity in the reach upstream. After the higher flows in winter the aquatic habitat has substantially improved both upstream and downstream as natural gravel movement and features have been restored. The land owner and local fly fishers have both commented on the improved river conditions following removal.

Oaker weir removal

Re-Connecting Woodgate Valley (Phase 4)

In partnership with Birmingham City Council and Woodgate Valley Rangers, we have removed four weirs on the Bourn Brook in Woodgate Valley Country Park. This project was funded by the Water Environment Improvement Fund. By removing these weirs, a significant length of Bourn Brook through the valley has now been re-connected. This work represents a continuation of the ongoing work the partnership has been carrying out in Woodgate Valley Country Park. The work will help to improve the ecology by improving habitat connectivity, in-channel morphological diversity and will also help the river to function as naturally as possible.

Woodgate Valley weir before and after

Rivetts weir removal

Rivetts weir was a significant barrier to fish migration on the River Dove. With funding from the Fisheries Improvement Programme, a partnership between the EA, Wild Trout Trust and Birdsgrove fly fishing club were able to remove the weir. In doing so, a significant length of River Dove (around 2.1 km) was opened up for coarse fish, trout and eel migration. The project will also improve habitat connectivity for other aquatic species and improves sediment transfer.

Rivetts weir before, during and after

Unlocking the Severn Project

We are a key partner in Unlocking the Severn, a LIFE / HLF project designed to allow the rare twaite shad access to 253 km of historic spawning grounds which they are currently prevented from reaching due to a number of weirs on both the River Teme and the River Severn. The Heritage Lottery Board will determine our Stage 2 application in late June 2018 and if successful the project will deliver the biggest programme of its kind in Europe, becoming a £20 million fish passage and community engagement programme of works jointly funded by HLF, the EU LIFE Nature Programme, the Environment Agency, Canal and River Trust (Lead Partner), Severn Rivers Trust and Natural England.

Significant work has been undertaken this year during the development phase including landowner negotiations, making a Compulsory Purchase Order using EA powers, completing detail designs and costings, implementing a comprehensive monitoring programme, and beginning an events programme for the public.

Unlocking the Severn map and Powick weir drop in session

Drop in sessions and angler meetings were also held with interested parties who expressed both concerns and support for the fish passage improvements we are making to Powick weir. The work will begin in early July 2018. Feasibility options for a full, partial and complete removal scheme were on display to members of the public and anglers so they could ask questions to EA staff and gain a greater understanding of the project. The drop in session was well received with lively debate for and against.

Severn basin predator study

The Severn basin Predator Study is a PhD part funded by the EA, Bournemouth University and the Severn Rivers Trust. This study has so far provided a really valuable insight into the current status of zander and pike populations in the Rivers Severn and Avon and will also highlight any changes in populations over time. The health of any predator population is directly correlated to the abundance of prey species and therefore monitoring predator fish populations will give a good indication on the health of the river system as a whole. Every month or so, fisheries staff assist the PhD student with seine netting Upton-on-Severn marina on the River Severn and Tewkesbury marina on the River Avon. Any pike and zander that are caught, have an acoustic or dorsal fin tag fitted. This tag is picked up by 10 receivers situated in the River Severn which log the movements of the fish.

Anglers contribute to this study in a variety of ways; reporting sightings of tagged fish, catching fish to be tagged and submitting their own citizen science data. Anglers fished from boats and on pegs at Upton-on-Severn in September to help catch 25 predator fish for tagging. The anglers have study kits with which they can record the length of the fish and take scale samples. This data is a vital component of the study. If you wish to take part please contact us and a study kit can be sent to you.

Specimen roach and pike netted at Tewkesbury marina

Study kits

Severn & Wye tool bank

As part of the rod licence funded Fisheries Improvement Programme, Fisheries staff have secured £9,500 of funding and purchased equipment (such as hand tools and waders) for environmental groups. The 4 groups were extremely grateful, with some willing river volunteers using their new tools later that day to allow access to swims ready for the start of the trout fishing season. This scheme has allowed local groups to manage rivers and stillwaters to benefit the environment and increase the angling potential; the only cost incurred has been their time. If you would like to know more about possible Fisheries Improvement Programme funding for your club or environmental group please get in contact.

Fisheries Officer presenting tools to the Severn Rivers Trust for volunteers to use

Battlefield Brook, Worcestershire

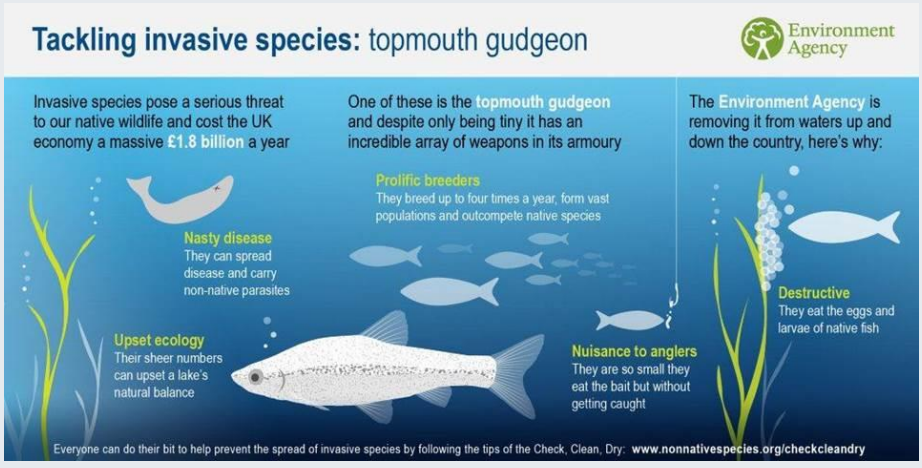
Fisheries and Biodiversity Officers have worked in conjunction with Severn Trent Water and Redditch and Bromsgrove Council to free a watercourse from its concrete lined channel. The Battlefield Brook in Bromsgrove is being restored in two phases; the first phase involved creating a new watercourse and filling in the old concrete lined channel in the upper section of Sanders Park. Extensive bank re-profiling has been undertaken complemented by coir matting, erosion prevention and wildflower seeding. A second phase is due to be delivered in the next financial year. This second phase is planned to create back waters and in channel variation in a more natural channel. This is primarily to increase habitat for water voles (this is one site in the county that there is a population remaining) but will provide enhancement for wildlife, including fish in the channel. In total, approximately 700 metres of watercourse will be restored, meanders re-instated with riffles and in-stream gravel providing habitat diversity for invertebrates and fish species and wetland areas retained, as well as providing a large scale amenity value and proximity to flowing water to the hundreds of park users.

Flows returning to a newly meandered channel and new channel with re-profiled banks

Topmouth Gudgeon (TMG) eradication, Herefordshire

In November, local fisheries officers and those that are part of a National Non Native Invasive Fish Team undertook a large scale eradication of a small fish called a topmouth gudgeon. The fish originates from Asia but how it became established at the complex of pools is unknown. Staff used a plant based piscicide, a poison that targets fish, to eradicate the species from all of the pools where the species had been found in traps in September. The residents of the site are now much more aware of the consequences of these invasive species being spread and are looking forward to re-stocking some of the pools once the treatment has de-graded. A four year trapping programme will commence at the site to ensure the species is eradicated. This is the 25th site that topmouth gudgeon have been eradicated from. It is a high priority species for Defra to eradicate.

Fisheries Officers inspected a recently treated pond



Topmouth gudgeon poster

National crucian conservation project (NCCP)

As part of the National Crucian Conservation Project, two stillwaters fulfilled the criteria for the stocking of crucian carp provided by the rod licence funded EA Calverton fish farm. In July, approximately 200 1+ year class crucians were stocked into a newly established stillwater in Gloucestershire belonging to Gloucester Angling Club. In May, 100 0+ and in July, 300 1+ crucians were stocked in the Jubilee Fishery belonging to the Jubilee Angling Society in Worcestershire. The Jubilee Angling Society worked in conjunction with fisheries staff to net, then drain down the pool to ensure only crucian carp are present once stocked. The pond will become a training pool to encourage junior anglers to take up fishing. Fisheries staff have worked with anglers at both sites to provide fisheries management, habitat improvement and water quality advice. If you would to be part of the National Crucian Conservation Project please contact us to see if your stillwater qualifies.

Fisheries Officer explaining the expected growth rates to Jubilee Angling Society member and 1+ year class crucian carp

Barbel stocking River Severn

Rowley District Angling Society assisted the Environment Agency with an angler/citizen science study to understand whether stocking barbel to larger rivers like the River Severn will improve the health of fish stocks and angling. The club have provided fishing match catch returns for two decades which has given fisheries staff a great insight to the health of river and its fish stocks. The club have been issued sample kits and been trained on how to safely remove scales for ageing analysis. This information, along with length and weight data provides a good indication of the health of barbel in the River Severn at this fishery.

Fisheries staff acquired 250, 2 year old barbel (8 to 10 inches long) from the rod licence funded Environment Agency Fish Farm at Calverton, Nottingham. The fish were purely river strain fish and have been reared in conditions that enhance their fitness for river life. Each of the fish were marked with a clearly visible bright pink elastomer implant so that local anglers can identify them as the stock fish from this year. Members of the angling club assisted fisheries staff with stocking the fish on their stretch of the River Severn at Coalport.

The Environment Agency have agreed to repeat the stockings of marked barbel over the next three years, but it is hoped the study of the highly prized barbel catches on this part of the River Severn, with the angling society will continue for many years after.

Angler being trained in scale removal, fish farm staff netting out the barbel and elastomer implant in position

Salthouse farm pool stocking

We stocked 200 tench into Salthouse Farm pool, Weston Coyney as part of a rehabilitation project. Another 6200 fish (a mixture of roach, bream, tench, barbel, chub and dace) from our fish farm at Calverton were stocked out as part of the project and post pollution work in 2017 to 2018.

One of our fisheries officers with members of the angling club at Weston Coyney

Angling Trust forums

Every 4 months Fisheries staff attend and present at an Angling Trust forum which is open to anglers and angling organisations. The format for many years has previously been a series of presentations updating the audience on where their rod licence money has been spent regarding fisheries work, campaigns and prosecutions across the Midlands. Due to popular demand, the format has now changed to incorporate audience participation via discussion topics. The most popular to date has been the discussion on the closed season, should the dates remain, be changed or should it be scrapped all together? Such events give anglers the opportunity to voice their concerns or show support for work being undertaken by the EA and the Angling Trust. These forums are free to attend and are your opportunity to have your say about fishing and fisheries activities in the Midlands. So why not come along?

Angling Trust forum in Worcester

Promoting biosecurity

Practising and promoting biosecurity is a fundamental part of our work whether it is promoting best practice internally with staff, externally with contractors or at stillwaters to ensure equipment disinfection procedures are followed. Our biodiversity officers deliver training sessions to ensure that every activity undertaken in/ near watercourses has biosecurity at the heart of the work ethos. Hot topics are invasive weed identification and removal and ensuring check, clean, dry procures are followed for all items of clothing and equipment. This advice is also given by fisheries officers at stillwaters, encouraging keep nets and un-hooking mats to remain on site and to be disinfected before and after use. By disinfecting equipment and waders, anglers can reduce the spread of invasive weed, invertebrates and fish as well as prevent the spread of contagious fish diseases such as Koi Herpes Virus (KHV).

Biosecurity officer delivering invasive species training with contractors and a good example of biosecurity best practice at a still water

Institute of Fisheries Management workshops

In partnership with the Institute of Fisheries Management (IFM) we hosted a rod licence funded, two day workshop on fishery management best practice. The event was attended by over 25 anglers, angling club representatives and private fishery owners. Topics included water quality, appropriate stocking densities and predation management.

Institute of Fisheries Management meeting

4. Monitoring

Monitoring of all fish species is vital to our assessment of the condition of the environment. Surveys of fish populations, including coarse fish, are used to assess the status of stocks and contribute to the overall assessment of ecological status of a water body. In WMD:

93 Waterbodies **assessed** for fish 2016/17

46% of waterbodies assessed were at good status or above for fish

You can look at our Catchment Data Explorer for more information.

Our fish count data is now available online here

Shad watch / spawning watch

Fisheries and Biodiversity staff have run multiple schemes involving members of the public, local businesses and angling clubs to contribute to collecting data as part of various citizen science projects. This work is vitally important as it gives people a sense of connectivity and ownership with their local environment, provides invaluable data sets, boosts their wellbeing and understanding of local issues. Such schemes will run for several years and are often in partnership with other organisations.

The Shad Watch scheme took place from April – July and involved many keen volunteers from Tewkesbury and the surrounding area to monitor the movements of shad over Upper Lode weir on the River Severn at Tewkesbury. The scheme was co-ordinated by Severn Rivers Trust and the data will feed into a multi-million pound fish passage scheme (the largest undertaken in Europe) called Unlocking the Severn which is planned for 2018.

Fisheries and Monitoring staff regularly attend key vantage points on the River Teme to monitor the salmon run and answer queries from the public to raise awareness of the importance of this iconic species and the journey it undertakes during its lifecycle.

Shad watch at Upper Lode weir, Tewkesbury and watching the salmon run at Ludlow

Surveys

In West Midlands 129 fish surveys were completed in 2017. Of these 102 were using standard electric fishing, 20 were fry seine netting and four were hydroacoustic surveys. The core fish programme this year included the Gloucestershire Frome, Warwickshire Stour, River Anker and River Mease. There were a number of pollution investigations (River Morda and River Leadon) and a low flows investigation on the River Teme. The resistivity fish counter continued to be run at Carreghofa on the Afon Tanat.

Largest fish caught during 2017 fish surveys

1st River Anker, Fieldon Bridge Pike = 1000mm

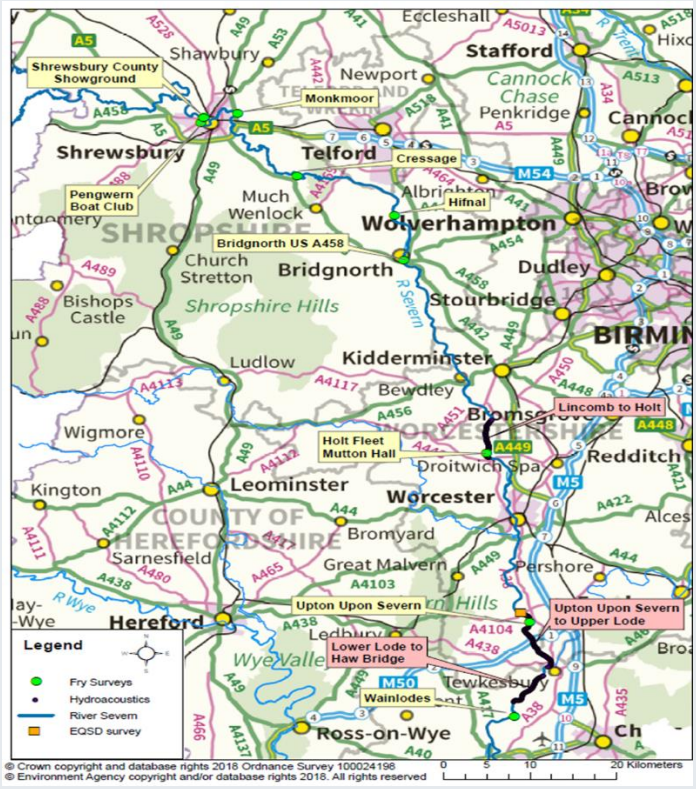
2nd River Penk, Cuttlestone Bridge Eel = 700mm

3rd River Penk, Cuttlestone Bridge Pike = 689mm

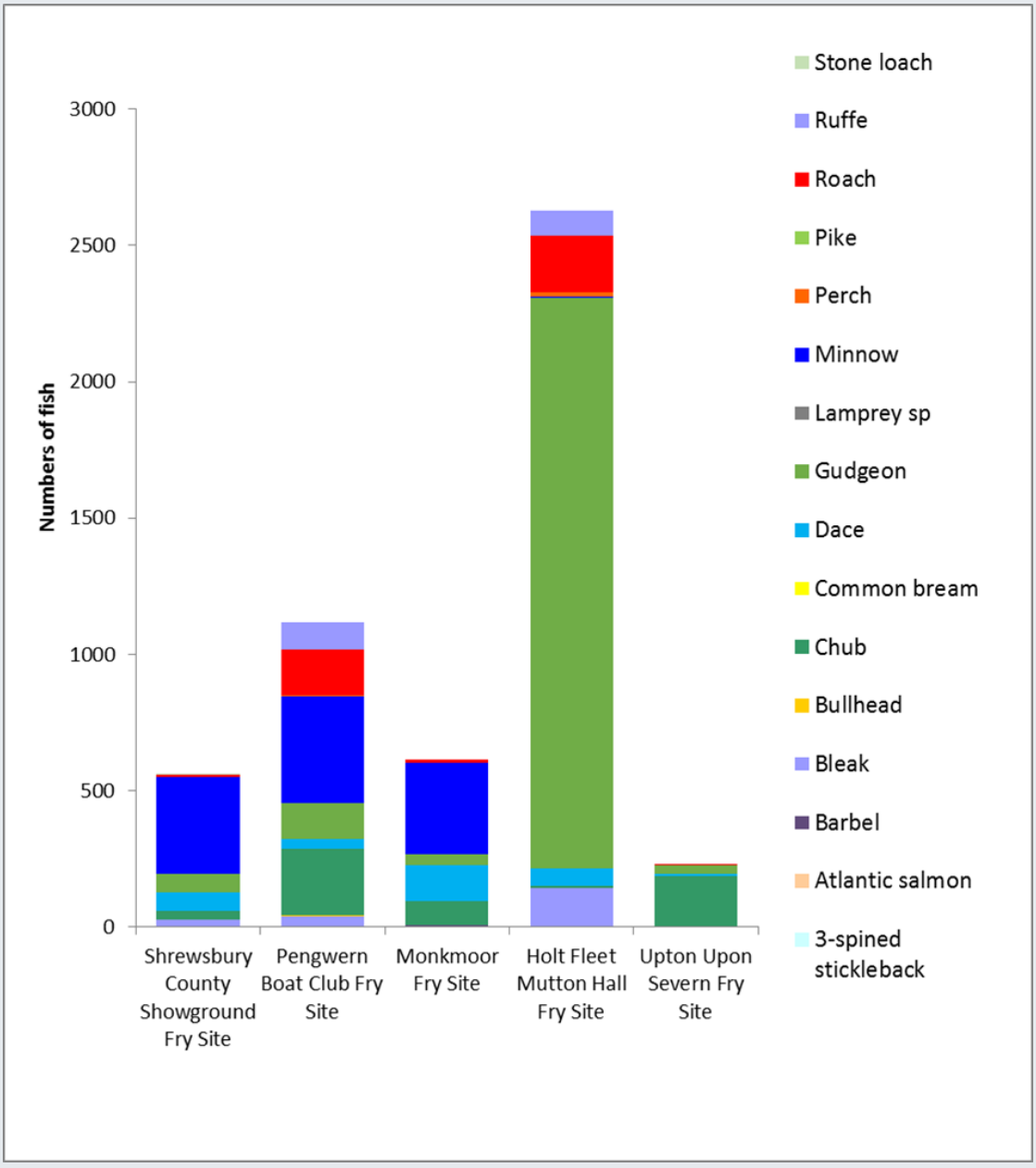
4th River Lugg, Downstream Ballsgate Weir Eel = 660mm

Severn

During 2017 there were a number of surveys undertaken on the English section of the River Severn to assess the coarse fish population. Here are the sources of data we looked at:



Fry surveys - All the 2017 fry surveys were undertaken using the same methodology. Twenty five metre long micromesh seine nets were used to catch fry in shallow sections of the river.



Number of fish caught during 2017 fry surveys

Fry surveys on the River Severn in 2017 showed a good mix of juvenile fish. As seen with match catch data, dace and chub appear to be the most abundant angled for fish (not counting gudgeon). Barbel fry were only found in low numbers at two sites, although results were not available for the sections where barbel tend to have been found in larger numbers.

Hydroacoustics

Hydroacoustic surveys are undertaken at night as fish are more likely to be in the open water. The main drawback with this methodology is that it will only give you an estimate of fish density. It is impossible to say which fish species are picked up in the survey and very difficult to estimate size/weight. However, it is a non-intrusive sampling methodology and quite long sections of a river can be surveyed in one night;

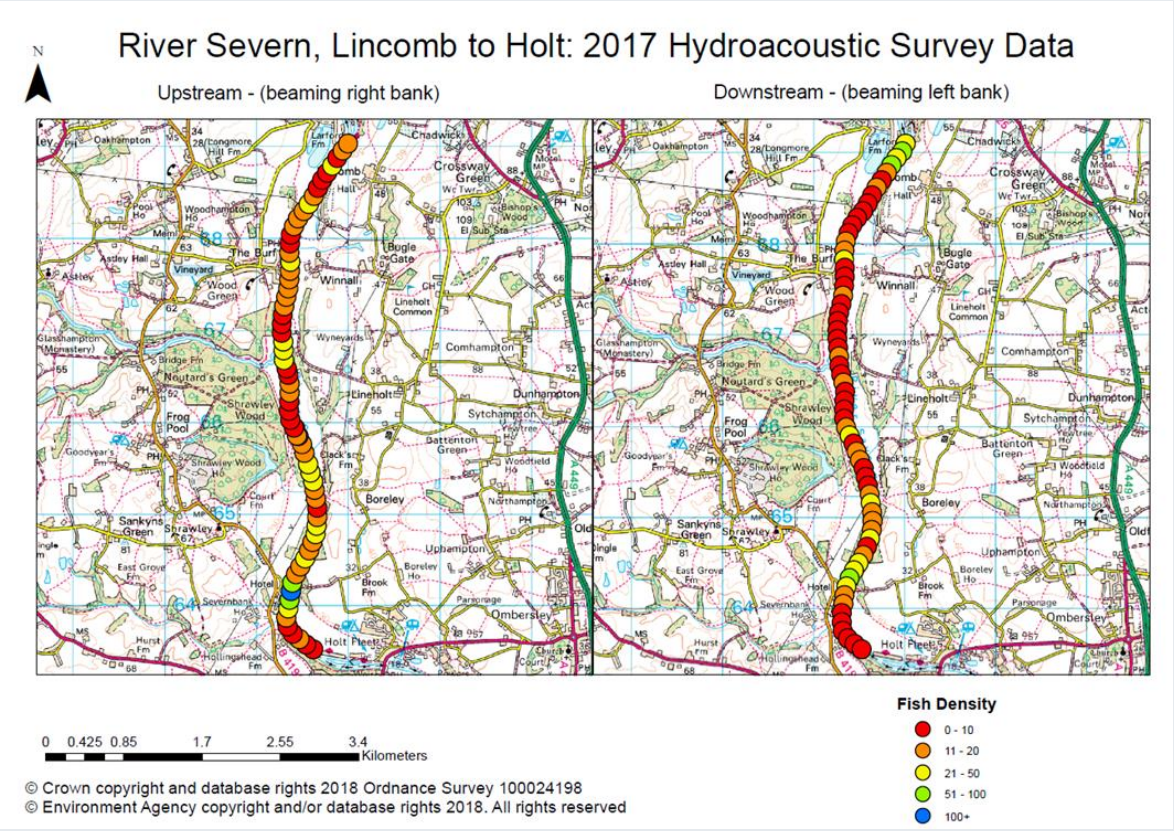
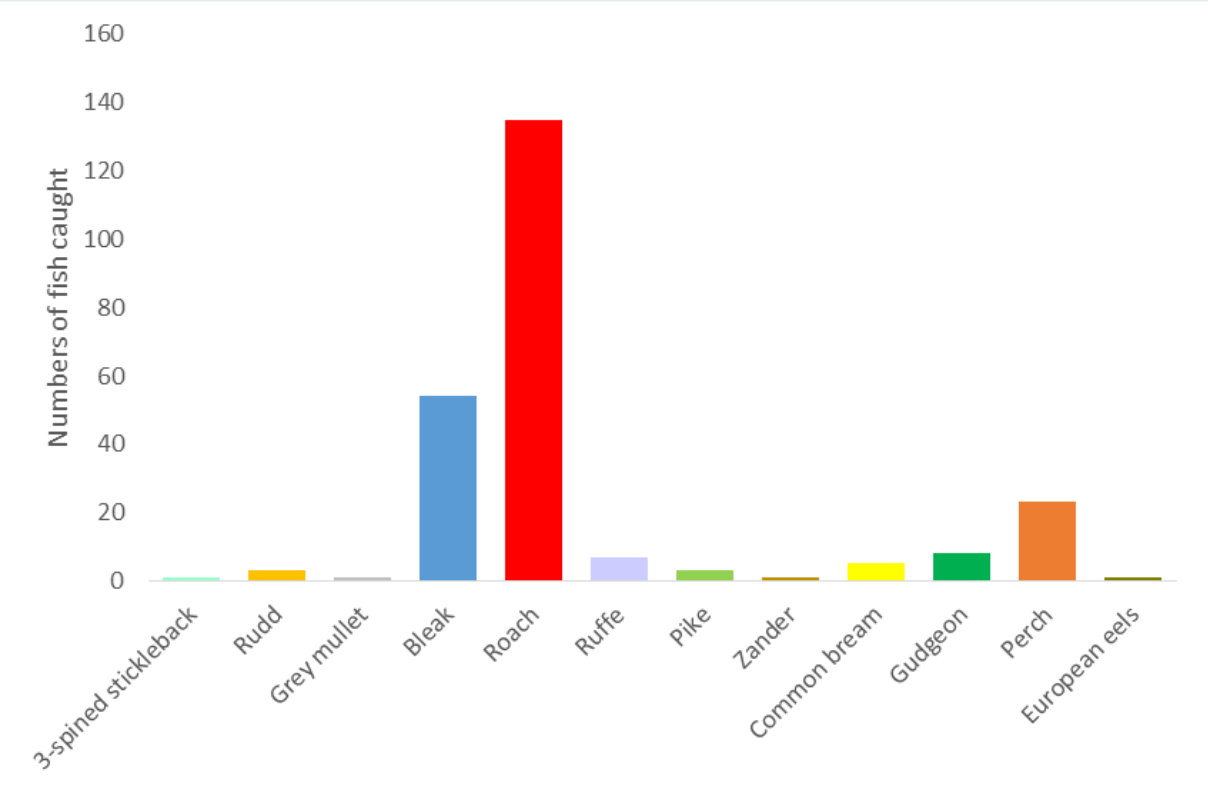


Figure 1 Fish densities from hydroacoustic data from Lincomb to Holt

Hydroacoustic surveys for the River Severn were generally showing low fish densities, although Upton upon Severn to Lower Lode had above average fish densities for that site.

EQSD survey

The Environmental Quality Standards (EQS) Directive is a daughter directive of the WFD and focuses on limiting the input of certain hazardous substances to the water environment. For this fish are caught and then tested for bio-accumulation of certain hazardous substances. The target species for these surveys in the River Severn are roach. Fish were caught using electric fishing from a boat. All fish caught by this method were identified, counted and measured.



Number of fish caught during EQSD survey at Upton upon Severn Marina

Roach caught on the EQSD survey at Upton upon Severn showed slower that average growth, compared to standard growth in Southern rivers. The reason for this slower growth is uncertain.

Overall as a coarse fish river the Severn holds a diverse range of species. Fry surveys show continued dominance of the silver fish with lower numbers of barbel fry caught in 2017. The new site found at Holt Fleet Mutton Hall was very productive indicating plenty of fish in this section, although hydroacoustic data continues to show reasonably low fish densities.

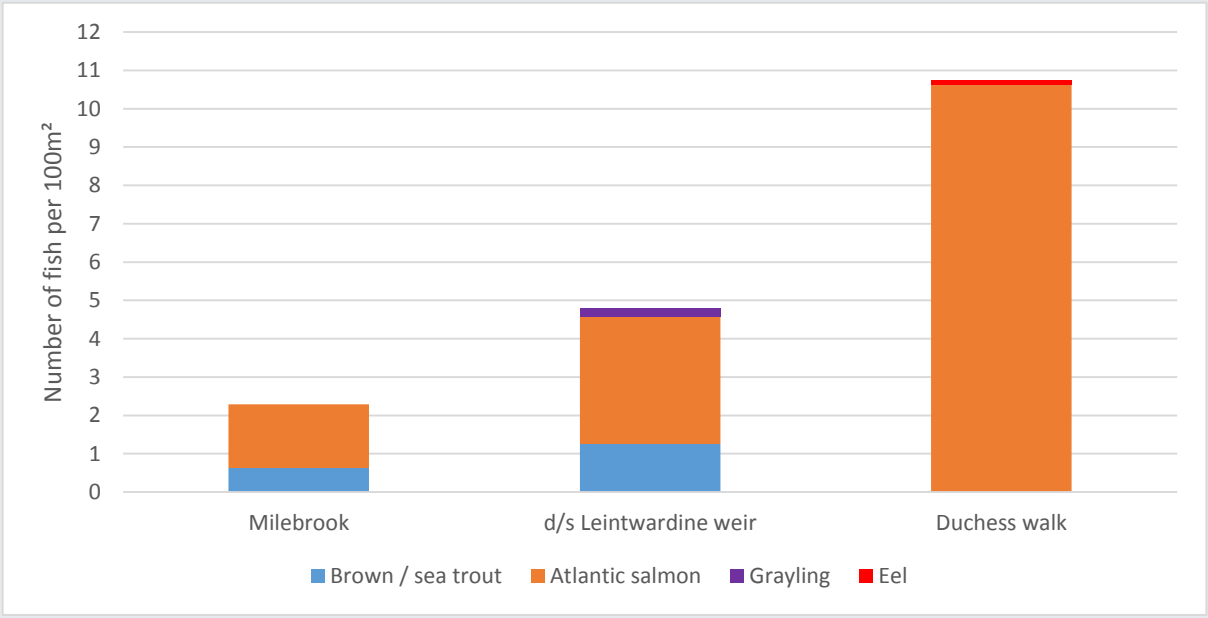
Teme

These surveys were carried out to assess the impact of low flows during the late autumn, early winters of 2015 and 2016 on Atlantic salmon migration, spawning success and the impact of prolonged summer low flow conditions.

Three sites were electric fished to assess the Atlantic salmon population:

- Milebrook
- Downstream Leintwardine weir
- Duchess Walk

Atlantic Salmon



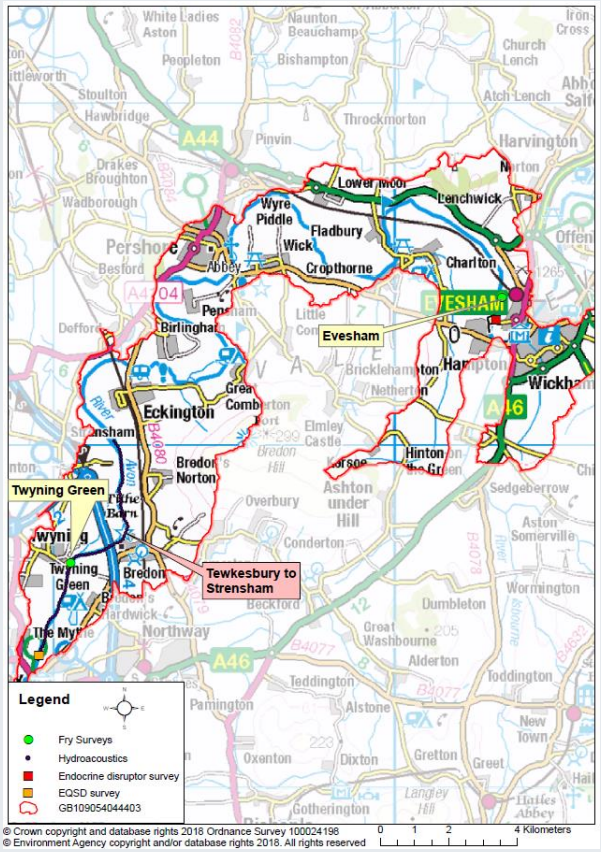
Density of fish caught during electric fishing investigation on River Teme

Overall the results indicate that Atlantic salmon migration and spawning has been relatively successful in the vicinity of the Duchess Walk site in the winter of 2016. The survey results from the sites at d/s Leintwardine and Milebrook may indicate that salmon migration or spawning success may have been impacted by low flows and barriers in the winters of 2015/16.

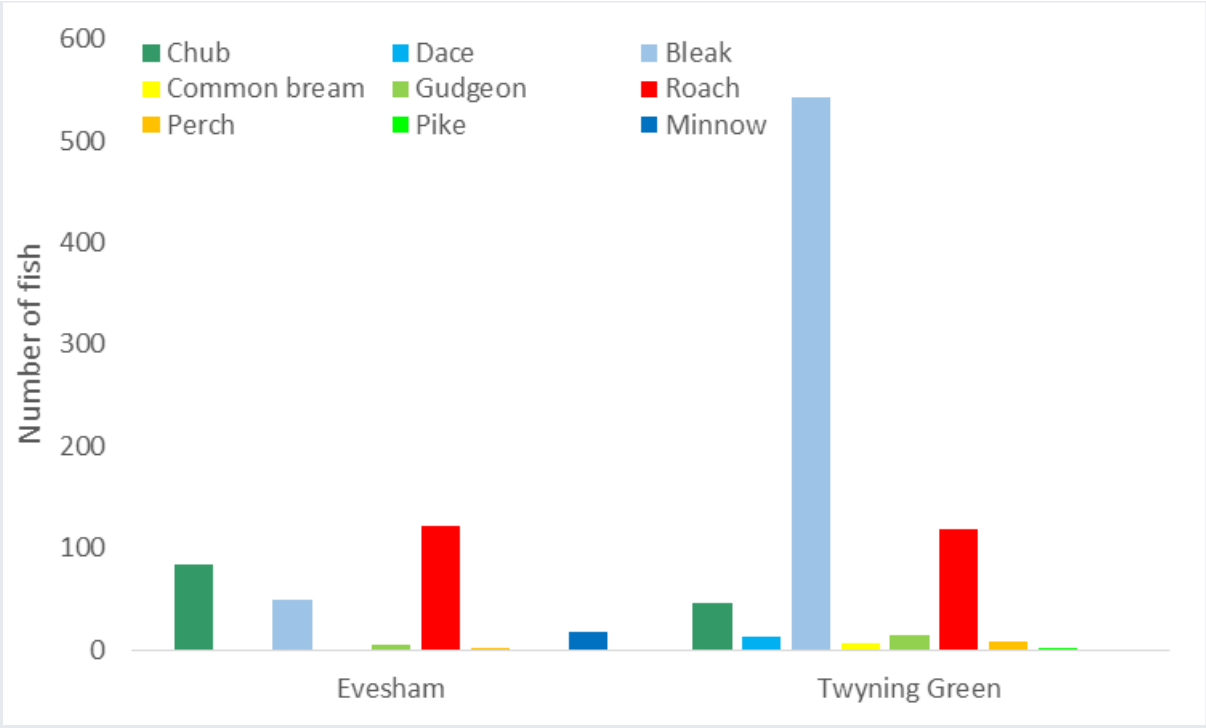
Avon

During 2017 a number of surveys were undertaken on the River Avon to assess the coarse fish population. A number of methodologies have been used including: fish surveys and hydroacoustics surveys as previously mentioned for the River Severn, as well as:

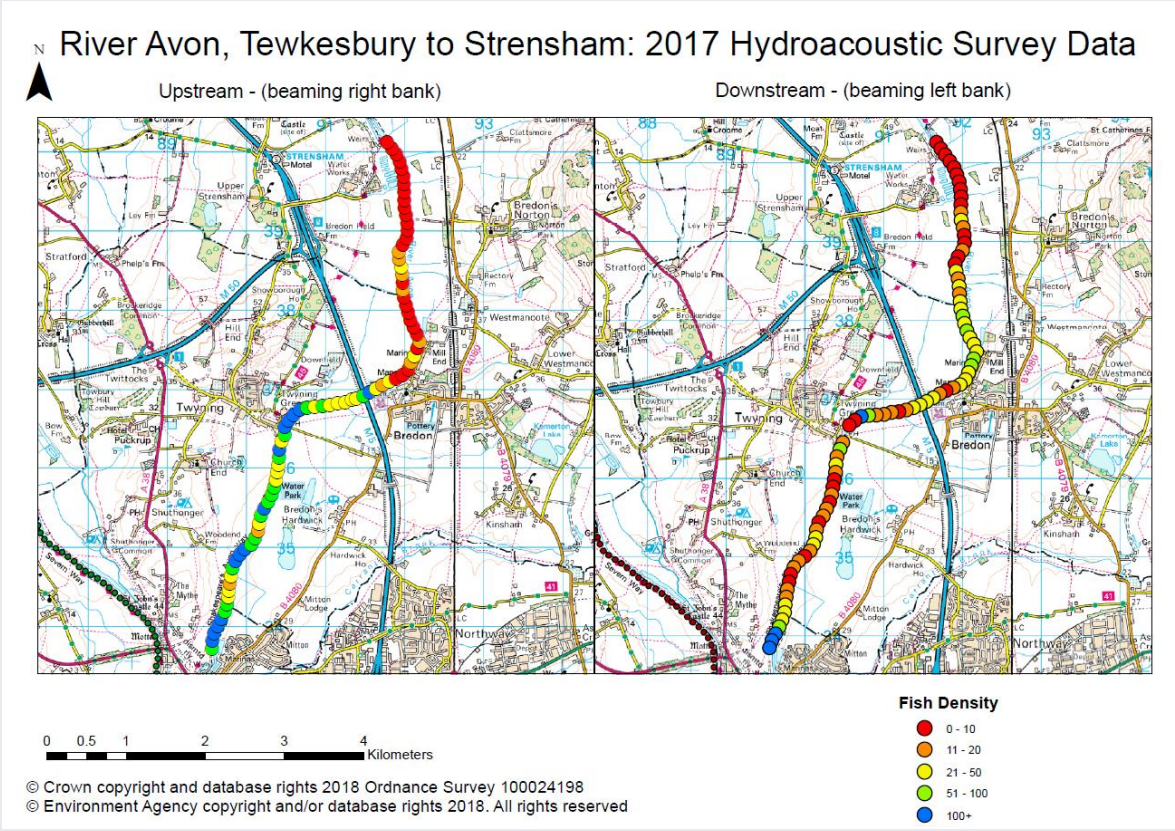
- EQSD survey - The Environmental Quality Standards (EQS) Directive is a daughter directive of the WFD and focuses on limiting the input of certain hazardous substances to the water environment. For this fish are caught and then tested for bio-accumulation of certain hazardous substances. The target species for these surveys in the River Avon are roach. Fish were caught using electric fishing from a boat. All fish caught by this method were identified, counted and measured.
- Endocrine disruptor survey - An endocrine disruptor is a substance that alters the function of the hormone system. This survey was part of a wider national programme that was being undertaken by Brunel University studying the oestrogenic effects they might have on fish. Roach were the target species for this survey and were collected by electric fishing from a boat at Hampton Ferry on River Avon.



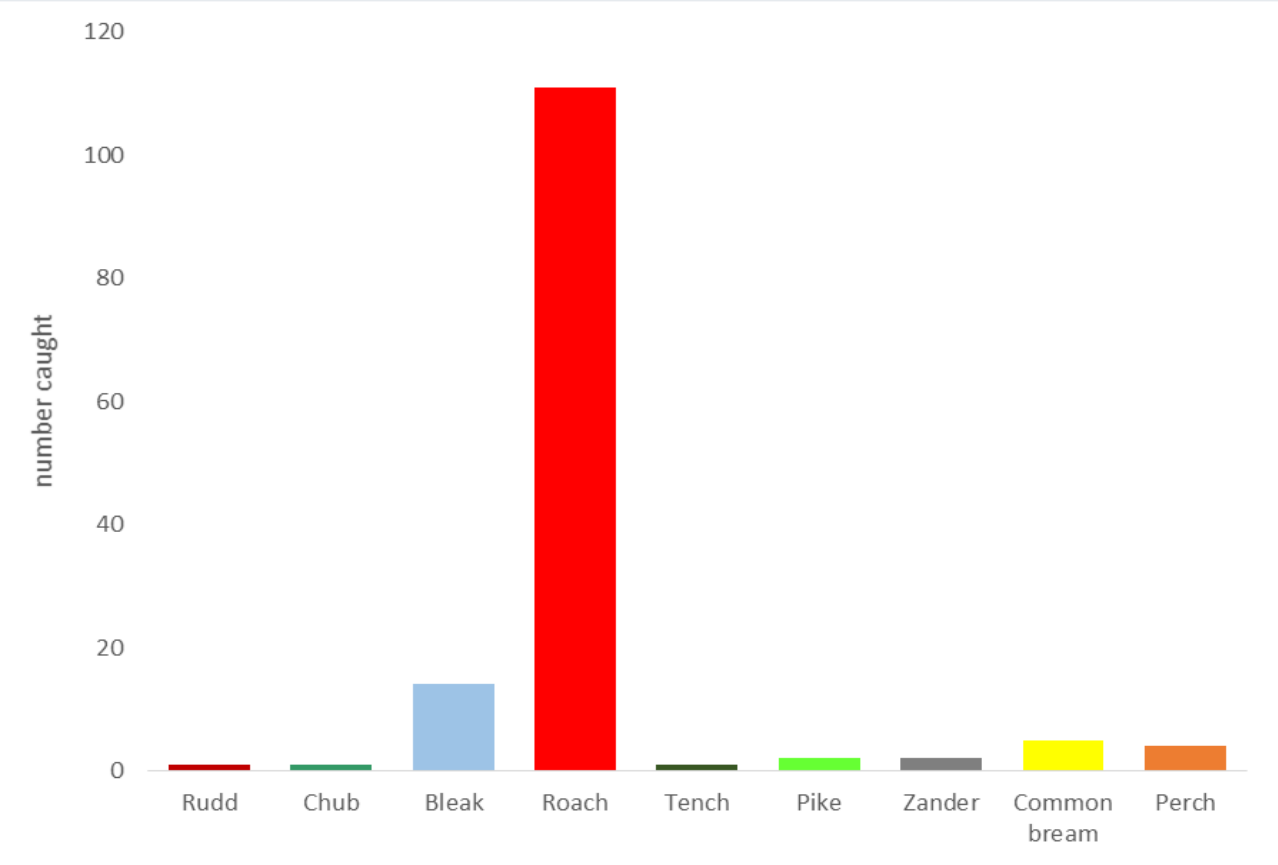
Map showing surveys undertaken on River Avon during 2017



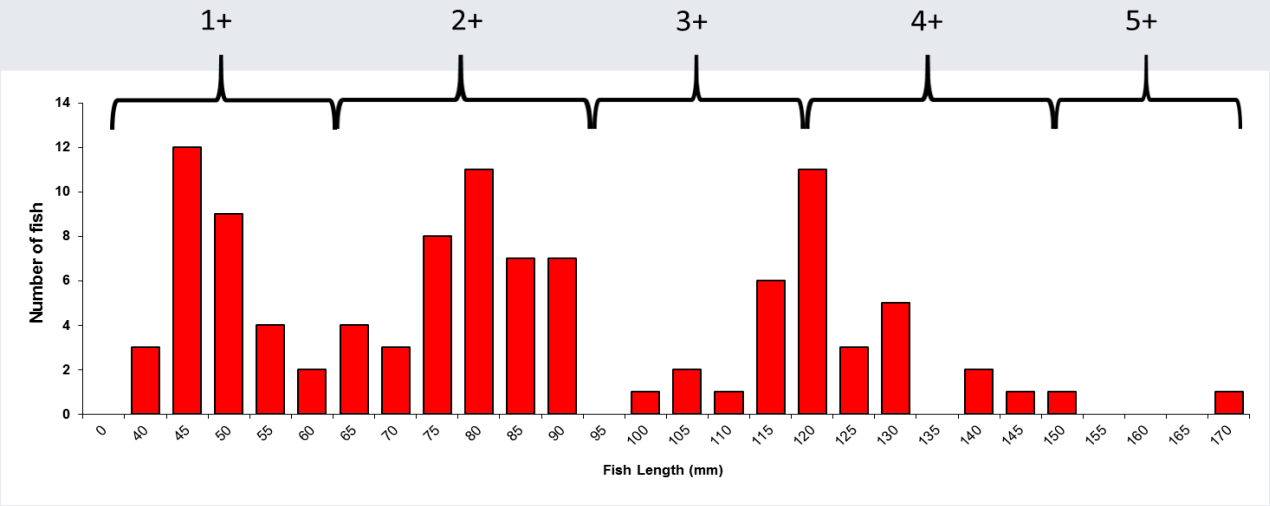
Number of fish caught during fry surveys on River Avon

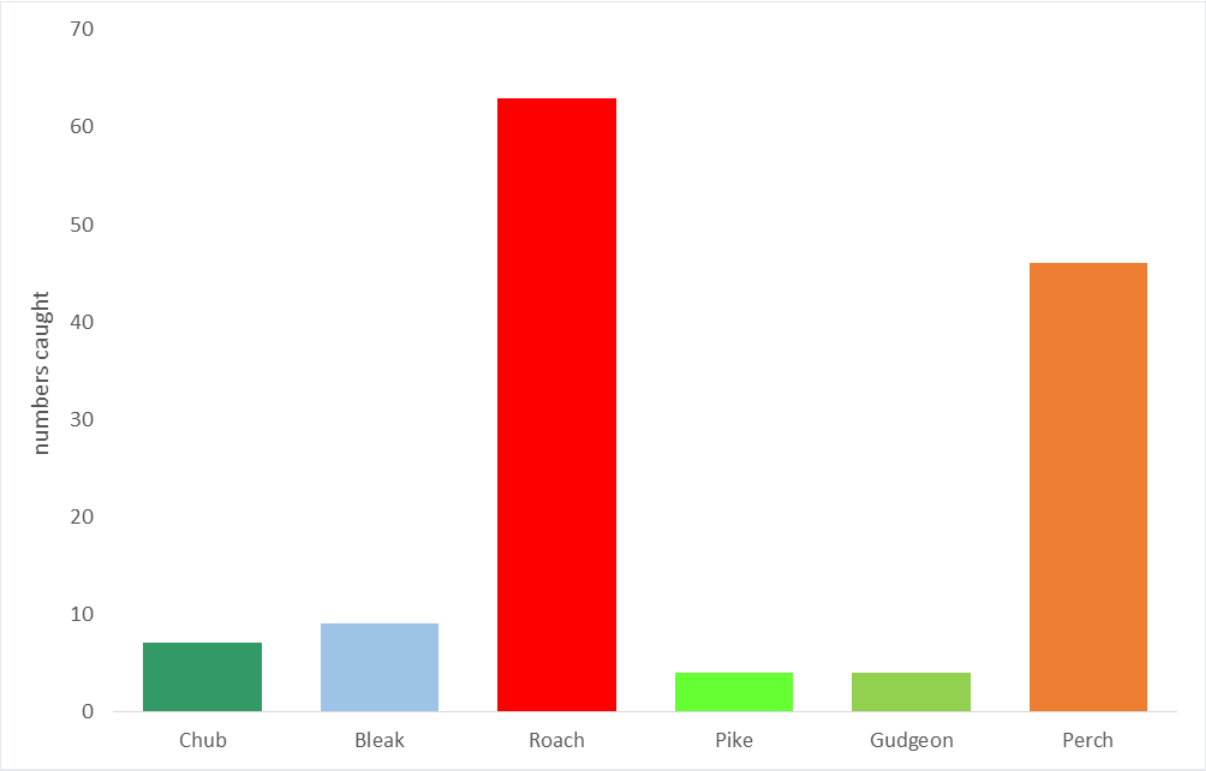


Fish densities from hydroacoustic survey on River Avon between Tewkesbury and Strensham



Number of fish caught during EQSD survey on River Avon in vicinity of Tewkesbury Marina





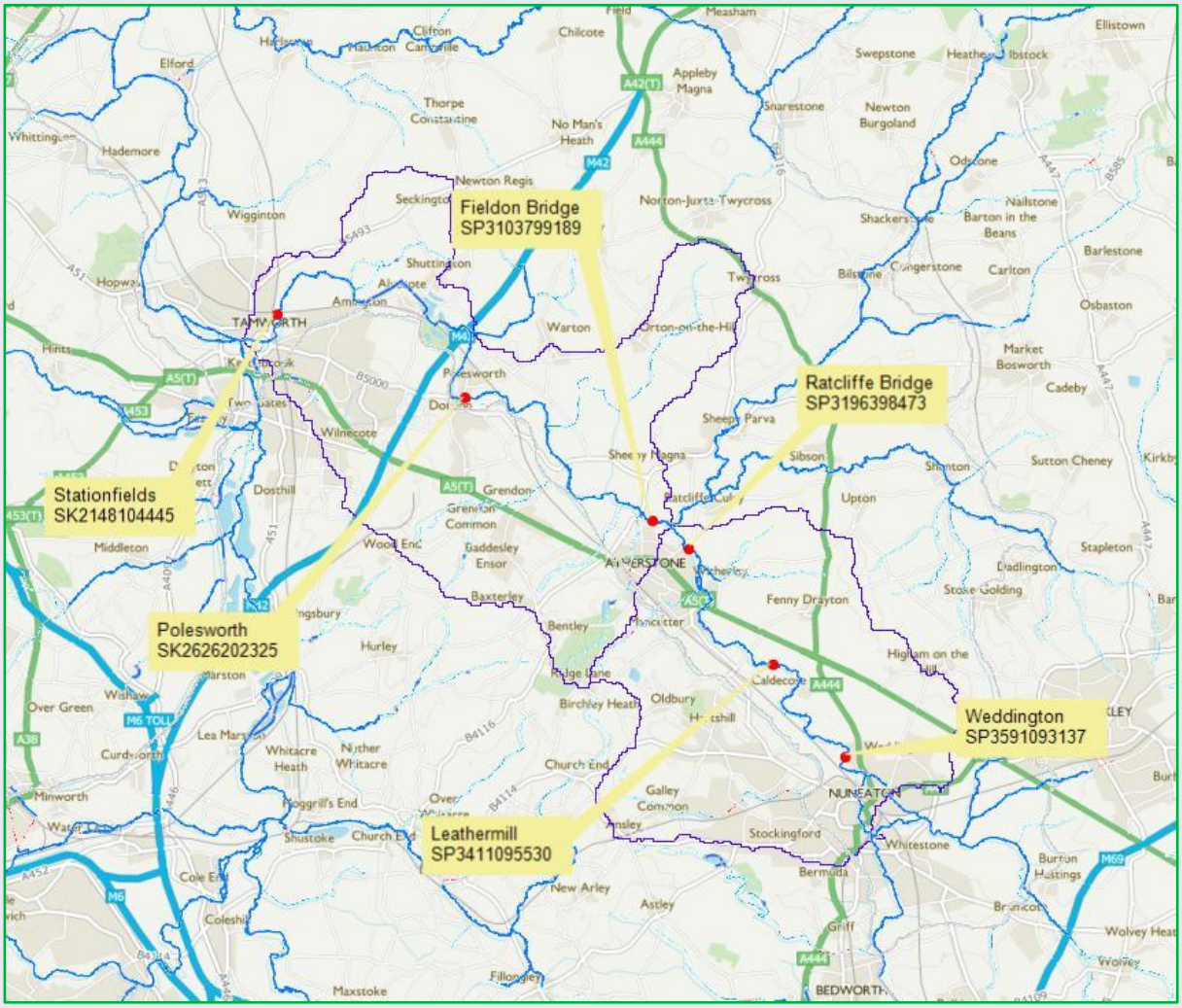
Fish caught during endocrine disruptor survey on River Avon at Hampton Ferry

Roach, bleak, chub and perch were the most common fish caught during surveys. Hydroacoustic survey showed a greater density of fish in the lower section of the Avon than around Strensham.

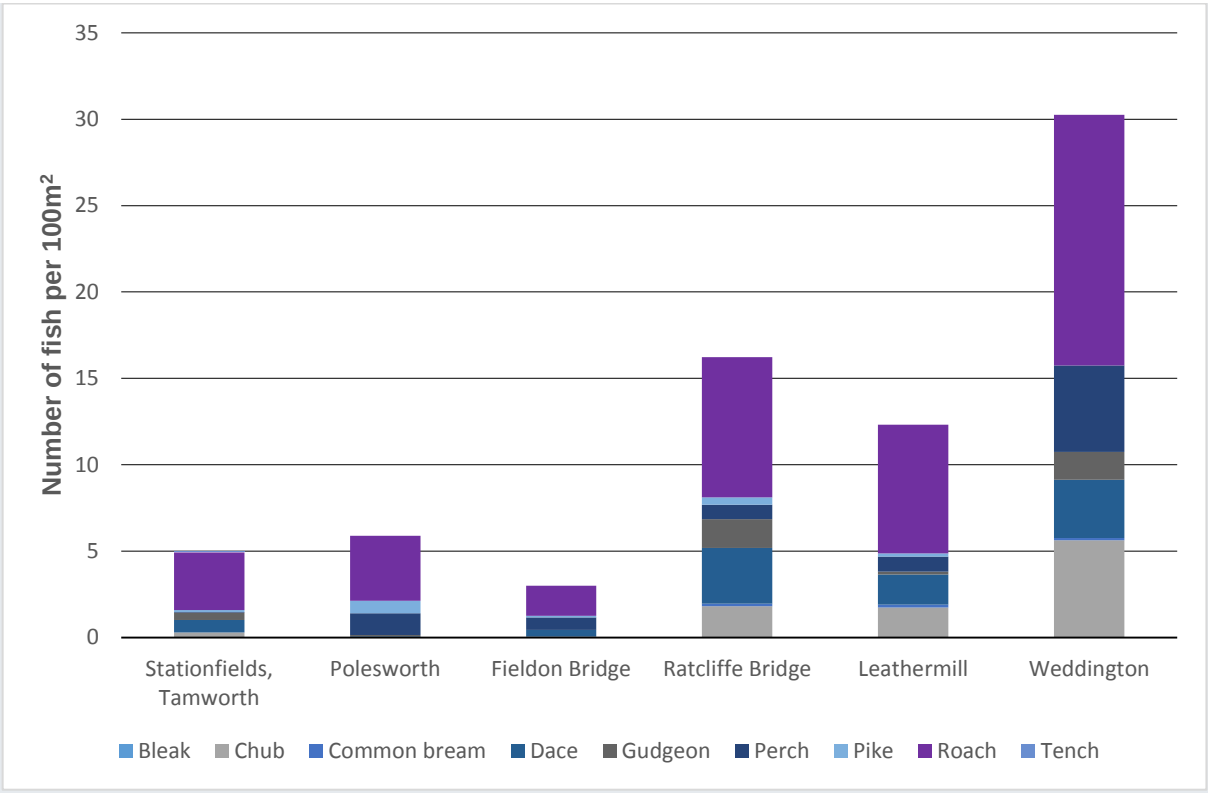
A selection of fish caught during fry survey at Twyning Green

Anker

This is a summary of results from fish population surveys on the River Anker between Weddington and Tamworth during 2017. The surveys were carried out to assess the health of the river and enable successful management of our principal coarse fishery.



Site locations of electric fishing surveys undertaken on the River Anker during 2017



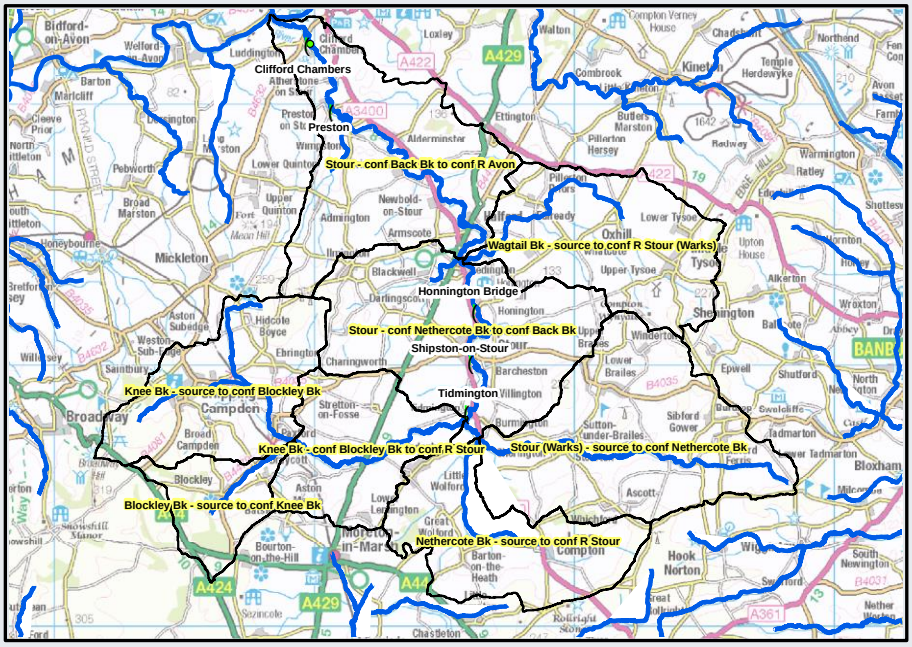
Fish densities of fish caught during electric fishing surveys on River Anker 2017

Chub (460mm) caught during electric fishing surveys on River Anker

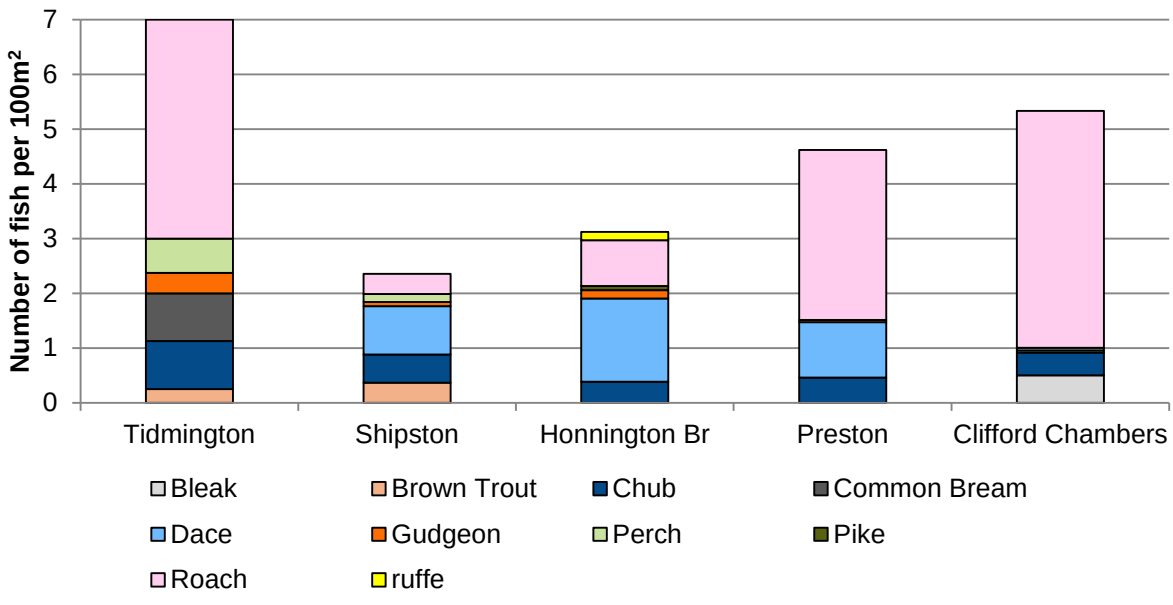
The overall health of the fishery appears to be good, with a wide range of species present at reasonable densities across all surveys sites.

Stour (Avon)

This is a summary of results from recent fish population surveys on the River Stour catchment between Chipping Campden and Clifford Chambers (near Stratford upon Avon). The surveys were carried out to assess the health of the river and enable successful management of our principal coarse fishery.



Map showing locations of electric fishing surveys (green dots). WFD waterbodies names highlighted in yellow



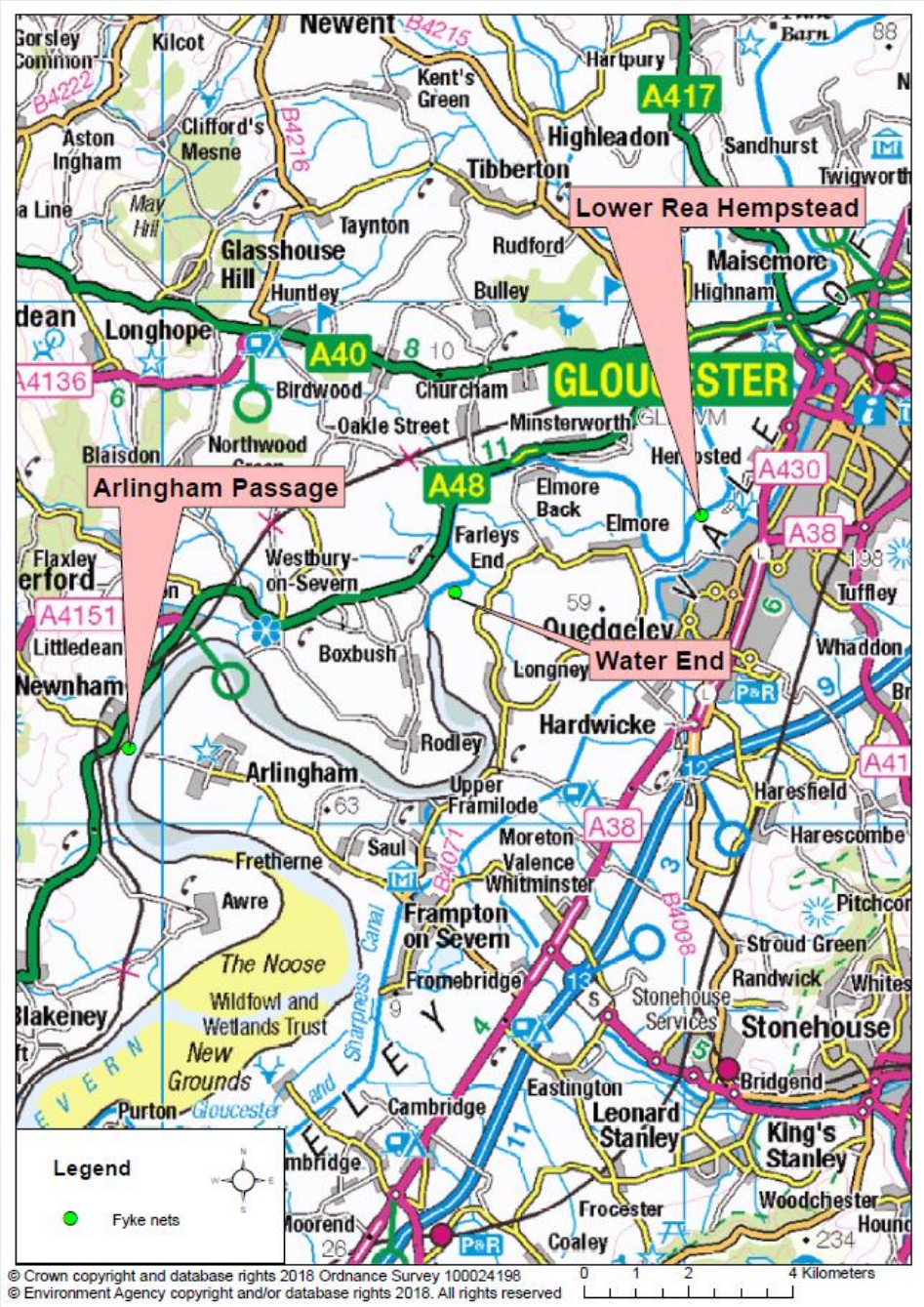
Densities of fish caught during electric fishing surveys on River Stour 2017

Overall the River Stour is a good mixed fishery with 14 species of fish being recorded.

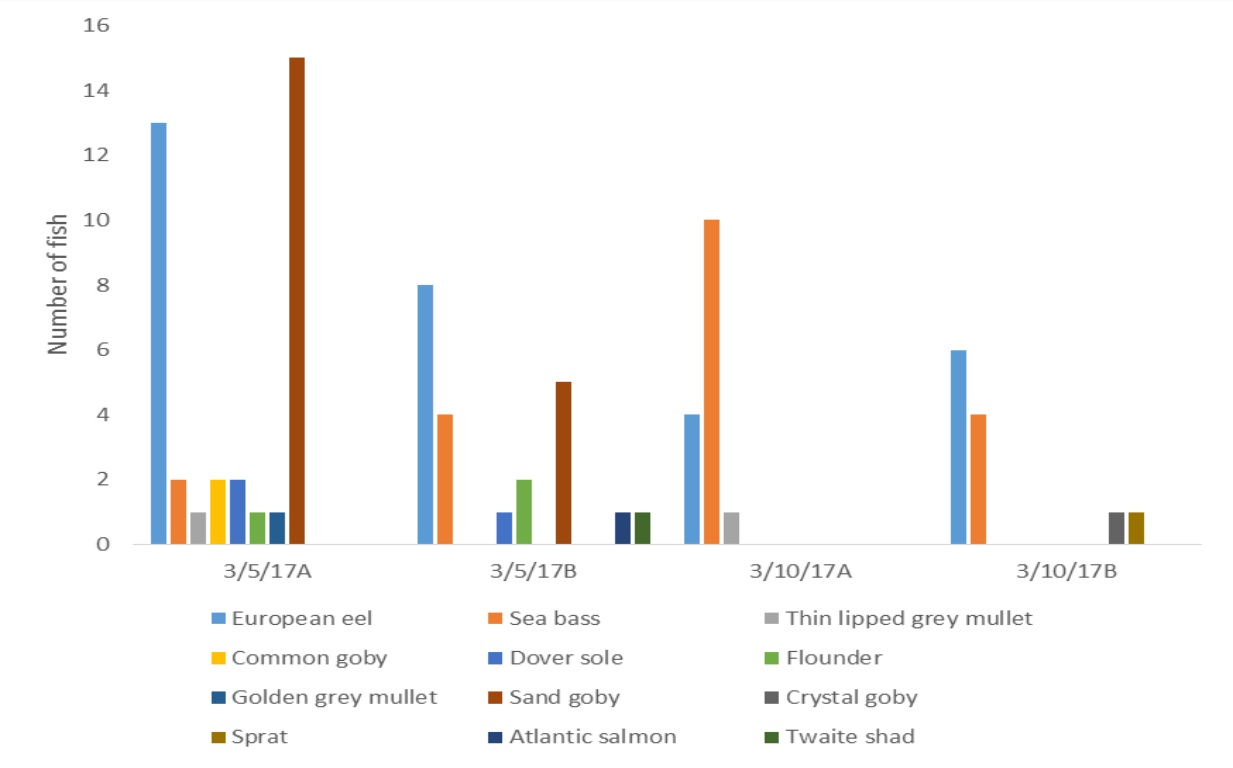
Transitional Fyke net surveys

Fyke nets (with leaders or wings) are conical nets with inscales and a circular or D-shaped opening held open by metal rings. There is a series of interconnecting nets with one-way entry to trap fish.

In transitional waters (estuaries), we use the Dutch ‘D’ type fyke nets which are set at low tide and fished over a full 12 hour tidal cycle. For example, low water to high water and back to low water. Fyke nets are fully submerged even at low water. We use two pairs of nets for each deployment.



Site locations for transitional fyke net surveys for Severn Estuary 2017



Number of fish caught at Arlingham Passage fyke nets 2017

A reasonable diversity of fish was caught during the Arlingham Passage fyke nettings, but very limited at both Water End and Lower Rea Hempstead. European eel were the most common species caught at all three sites.

Processing the fish at Arlingham and an eel caught at Rea

For information on what we are doing across the rest of the country read our other Area reports

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