

**RIVER IVEL
PROPOSED ACTION PLAN FOR THE IPA
(12TH JUNE 2018)**

EXECUTIVE SUMMARY

It is widely accepted there has been a general decline in the quality of the fishing on the river Ivel over the last 30 years. During this period the number of anglers fishing rivers has significantly reduced, with the majority of today's anglers exclusively fishing stillwaters. The SDAA committee analysed a number of key factors (i.e. predation; fish recruitment and stocking; water quality and quantity; habitat) that may have contributed to the overall decline in the quality of the fishing on the Ivel and where possible has made practical suggestions to reverse this trend.

It is likely that no single factor is solely responsible and any improvement in the fishing will require an action plan that addresses as many stressors as possible. Any action plan will require the IPA to work in partnership with other interested parties and/or lobby them for improvements to be made to the river. The IPA will need to identify key individuals who have the willingness, drive and sufficient available time to devote to the full implementation of any plan over a number of years. The SDAA committee believe doing nothing will lead to a further decline in the fishing on the Ivel and ultimately the demise of the IPA.

As an important first step, the IPA should collate and document evidence that clearly demonstrates the decline in fish stocks and fishing on the Ivel. This would provide leverage to help bring rents for fishing rights in line with the current state of the fishing. This evidence would also help convince conservation groups to support projects aimed at habitat improvements and support the IPA in lobbying for improved water quality and reduced abstraction.

Whilst habitat improvements will hopefully see improvements in natural recruitment in the longer term, SDAA is willing to support supplemental stocking for some species. Roach are considered the top priority species and these should be stocked in spring to give them the best chance of survival. Roach can be sourced from fish farms or, if sufficient willing volunteers are available, set up an Ivel Roach Project. Dace are another priority species but we would be reliant upon the EA for stockings as there appear to be no commercial sources. The EA could continue to stock barbel, but anglers need to accept that large barbel will be susceptible to otter predation.

RIVER IVEL PROPOSED ACTION PLAN FOR THE IPA (12TH JUNE 2018)

AIM

To provide practical suggestions that could be developed into a long term action plan for the IPA to adopt with the aim of improving the fishing along key sections of the River Ivel.

BACKGROUND

The IPA constitution makes the statement "*The objects of the Association shall be to preserve the amenities of the River Ivel and to protect and improve its fisheries*". However, like many rivers within the EA's Anglia Region, the fishing on the Ivel has been in general decline for a number of decades. This decline is probably the result of many factors placing different stresses on the river that have either directly or indirectly impacted on fish populations. Several IPA member clubs have relinquished their own fishing rights on the Ivel (i.e. Verulam, Abbey Cross, Phoenix) and poor fishing was usually the reason given.

The decline in fishing on the Ivel has coincided with the development of a large number of stillwater fisheries being established right next to the river using flooded gravel pits. These stillwater fisheries include commercial fisheries (e.g. Manor Farm, Henlow Bridge Lakes, Chestnut Pool), club lakes and carp syndicates. Many anglers now only fish stillwaters, have no interest in river fishing and probably lack the skills to fish rivers.

Historically the IPA and member clubs had a long tradition of match anglers willing to fish river venues. Interest in river match fishing is still in decline and many member clubs no longer have active match groups. It is several years since a member club booked an IPA water for a match. Therefore, the majority of anglers fishing the Ivel in the foreseeable future are likely to be pleasure anglers or more specialist specimen anglers, and with a strong bias towards a more mature (elderly) age group.

Although the total number of anglers within the IPA member clubs is probably well in excess of 7,000 members, the actual number of anglers regularly fishing the Ivel is likely to be in the hundreds (not thousands). Only a small proportion of these anglers will be willing to take on active volunteer roles to help reverse the decline in fishing on the Ivel.

It is also worth noting that the IPA are not riparian owners and therefore are not legally responsible for maintaining the river banks. The fish in the river are also classed as wild and are not owned by anyone. Therefore, any action plan will need to seek approval and/or input from other interested parties such as landowners, the Environment Agency, Wildlife Trusts, Bedfordshire Rural Communities Charity, The Upper and Bedford Ouse Catchment Partnership, Anglian Water, The Bedfordshire and River Ivel Internal Drainage Board, etc.

FACTORS AFFECTING FISHING ON THE IVEL

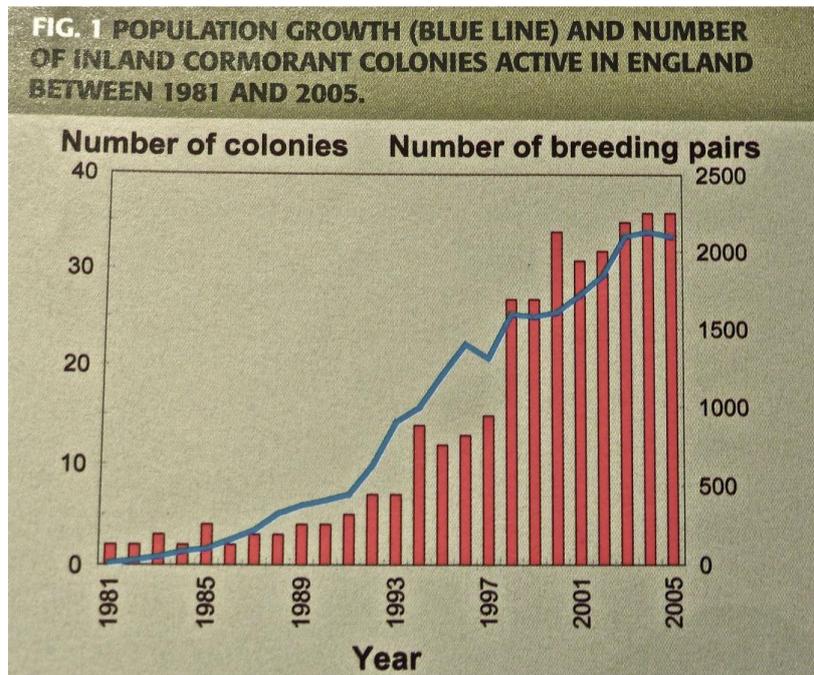
Anglers will cite many factors that have led to a decline of the fishing on the Ivel. It is likely that no single factor is responsible and the decline is probably the result of many different stressors. Therefore, any improvement in the fishing will require an action plan that addresses as many of those stressors as possible.

Predation

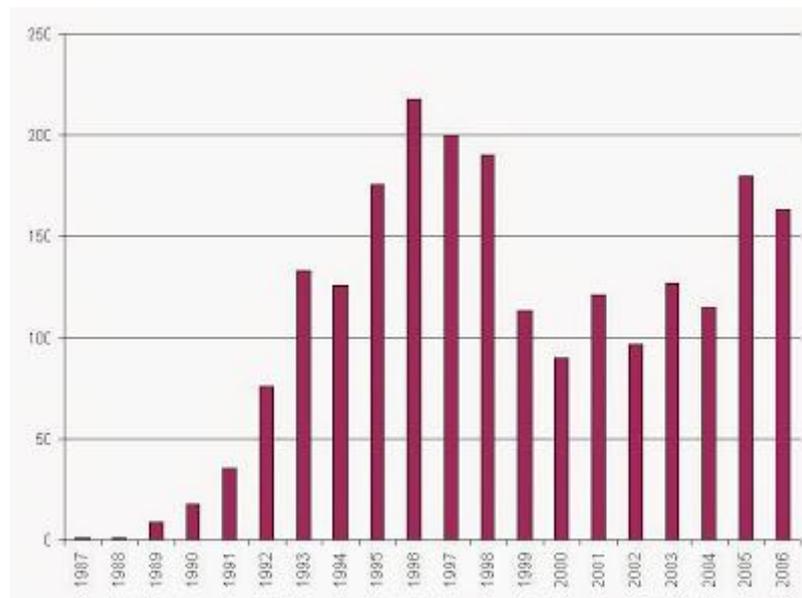
Predation is the most cited reason by anglers for the decline in angling along the Ivel. There is little doubt that the increase in the inland cormorant population in the 1990s coincided with a decline in roach and dace catches along the Ivel. The graphs below show data from the British Trust for Ornithology's survey of cormorants in England (1981-2005) and data produced by Paxton Pits that illustrates the growth in cormorant numbers locally (1987-2006). There are now several cormorant roosts located across Bedfordshire, with the roost at Southill Lake probably the nearest to the Ivel.

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The graphs only show the number of resident breeding pairs. Cormorant populations in the UK during winter months are boosted by 40,000 over-wintering birds from Europe (RSPB data).



Source: British Trust for Ornithology survey data published in British Birds 2007



Breeding population of cormorants at Paxton Pits (nesting pairs)

With far fewer anglers on the banks of the Ivel these days, the extent of cormorant predation goes largely unseen and is hard to quantify. Anyone who walks the river during the winter months will see plenty of cormorants flying along the Ivel valley and dropping in to forage for food, especially when stillwaters are frozen over. The immediate impact of cormorant predation is a reduction in fish populations from 1oz to 1lb, although cormorants are capable of eating smaller and larger fish. Fish behaviour in response to cormorant predation is usually manifested by silver fish shoaling tightly in locations where there are areas containing cover, especially if these are in urban areas with plenty of nearby human activity that deters the cormorants. Fish will often seek refuge during daylight hours and only feed under cover of darkness. Larger fish may be found with 'V' marks across their back or 'stab' wounds from a cormorant's beak, which can prove fatal if infected. For smaller species such as roach and dace, cormorant predation drastically reduces the number of sexually

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mature fish present in the river, which has a longer term negative impact on natural recruitment. Unfortunately dace usually shoal up ready to go through spawning in early March when most over-wintering cormorants are still present, whereas roach spawn in mid-May when only resident cormorants are present.

Culling cormorants under licence is a practical proposition on lakes, but not on a small river that is often flanked by public footpaths. SDAA's experience has been that limiting cormorant visits on our lakes has allowed silver fish populations to recover naturally without the need for restocking. The Ivel might benefit indirectly from reduced cormorant predation if local clubs could significantly reduce the local cormorant population through their culling activities on adjacent stillwaters. However, the licensing system is designed to set a limit on the total number of cormorants shot in a given area, so applying for more licences within the Ivel catchment area may not actually lead to an increase in the overall number of cormorants that can be culled under licence.

Studies suggest that fish refuges can be successful in limiting cormorant predation but their design is not conducive with flowing rivers. However, habitat improvements could be undertaken to increase the available cover for fish to use as natural refuges.

The mid-1990s also saw non-native American signal crayfish appear in the Ivel and its tributaries and these rapidly spread throughout the river and then into the Ouse. Their arrival coincided with a sudden collapse in the population of gudgeon along the Flit and Ivel Navigation. Scientific articles show that crayfish will eat the eggs of many fish species, compete for food that fish also eat and are capable of catching and eating smaller fish. However, their presence in the Ivel offered an alternative food source for larger species of fish that led to perch and chub reaching truly specimen proportions. The signal crayfish also influence the river by their burrowing activity that causes destabilisation of river banks and the mobilisation of sediment.

Signal crayfish can be legally trapped, but trapping will never eradicate signal crayfish from the Ivel. At best only a massive concerted effort along the whole length of the river over a large number of years would have any chance of a measurable impact on the overall signal crayfish population, and if trapping pressure were relaxed the crayfish population would quickly recover. However, some trapping trials have concluded that although numbers may be reduced during the short-term, traps favour the capture of larger individuals that predate on their smaller brethren. An unintended consequence of selective harvesting is the increased growth and earlier maturation of juvenile crayfish, which can actually cause the population to increase.

Logic suggests an intensive crayfish trapping regime in and around fish spawning beds before fish lay their eggs and continuing until eggs have hatched may help to improve fish recruitment, but we are not aware the relevant scientific study has been undertaken to prove this is a worthwhile exercise. Signal crayfish also provide an easy meal for both mink and otters that might otherwise be feeding on fish.

Otters are currently one of the most emotive subjects in angling. Without getting dragged into all the politics, SDAA conducted a great deal of research into otters back in 2009 following the well publicised loss of a 45lb+ carp at Willington Lake to otter predation. According to the Biggleswade Chronicle otters were spotted on the Ivel in 1989 for the first time since the 1960s (i.e. spotted before any otter releases in this area). Despite claims from anglers that large numbers of otters have been released from captivity into local rivers, our research showed four otters were released by the Otter Trust upstream of Bedford in 1994 and a further six otters released on the Ivel near Blunham in 1998. Their presence on the Ivel has been noted in the Bedfordshire otter surveys that have been conducted since 1996 and are now recorded on many tributaries, i.e. Hiz, Ivel Navigation and Flit. Their population has clearly increased along the Ivel during the last 30 years, but no one knows the actual number of otters living within the Ivel catchment. The local Wildlife Trust's comments back in 1989 that "otters prefer eels and sticklebacks" and that "the stretch of river between Biggleswade and Tempsford would only support one otter family" were based on dubious historical information. Otters are apex predators capable of killing any fish (or bird) in the river Ivel. Their return to the Ivel coincided with a downturn in the numbers of silver fish available as a food source, and it should not have surprised anyone that they ended up preying on the large barbel that

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the Ivel had rapidly become famous for during the last decade (cf. the demise of the barbel population at Adams Mill). If otters only killed small fish and ate all they killed, then they would have relatively little impact on fish stocks.

Otters are currently fully protected and fencing the river is not an option. Therefore, anglers have to accept they are going to be part of the Ivel ecosystem for the foreseeable future and any fish (specimen or otherwise) could be their next meal. SDAA members have commented on fewer large chub (>6lb) and perch (>4lb) being caught in recent years, although there is no direct evidence that otters are responsible for this. Chub and perch that are caught tend to be fin perfect and show no signs of a close encounter with an otter.

Mink are another non native predator that regularly prey on fish but their impact on fish stocks is usually limited to relatively small fish as they are not as well adapted to hunting in water as otters. Mink can be trapped and killed without the need for a special licence. Eradication of mink is an essential part of re-establishing water vole populations, which were once present in numbers along the Ivel. However, there appears to be no concerted effort by conservation groups along the Ivel to eradicate the mink population.

Amongst the fish population pike, perch and chub are predatory species that will all prey on smaller fish. Fish are constantly under threat from predation throughout their entire lives and in a stable ecosystem the number of predators will be determined by the available prey.

Fish Recruitment and Stocking

The Ivel is far from being devoid of fish. Good catches of chub can still be made along the Back Meadows and Biggleswade Common, and a SDAA member caught a 2lb 5oz roach from the Back Meadows last season. Although the focus of recent IPA matches in the Sandy area has been the number of dry nets, these matches have usually been won with respectable double figure weights of silver fish. As highlighted above fish tend to shoal tightly these days and on SDAA's own stretches good catches of silver fish can be had from certain pegs whilst large areas appear to be devoid of fish. The EA recently conducted a fish survey along a section of the Stanford Canal that only produced two large perch and a few small pike; whereas on the same day roach, dace and small chub could be seen in abundance in the fast water immediately below the disused Stanford Lock. Similarly only the odd fish can be seen on the Ivel on the outskirts of Stotfold, but on the nearby Pix Brook several areas are seemingly teeming with fish.

Populations of roach, dace, chub, dace, pike and even trout have been maintained in areas of the river that have never seen any of these species stocked. Therefore, successful natural recruitment of most species does take place in the Ivel. In the wild only a very small percentage of the eggs laid by fish will successfully hatch with the fry surviving through to sexually mature adults. There will always be good and bad years for natural recruitment in rivers.

If numbers of sexually mature fish are low there will be fewer eggs laid. Non native signal crayfish are known to eat fish eggs, so this will mean fewer eggs hatching. Fry survival is also dependent on many factors and it is important that they have suitable habitats that provide shelter from predators and places where they can avoid heavy flows. Healthy numbers of fry can often be spotted during the summer months along 'Broom River' seeking sanctuary in the marginal weeds. The EA then come along and cut the weed virtually from bank to bank, which must have a major impact upon the survival of these fry.

The Avon Roach Project has been successful in increasing the Hampshire Avon's roach population after it was decimated by cormorant predation. This has been a huge effort by a group of dedicated volunteers over many years and this model has now been adopted on other rivers. They successfully collected eggs from roach spawning in the Avon using floating boards carrying fine shredded netting and hatched these eggs in a controlled environment, before growing on the fry in stock ponds and finally returning the roach to the river after a couple of years. The roach are reintroduced in spring and this ensures they are not exposed to winter floods and at a time when most overwintering cormorants have returned to mainland Europe.

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Cormorants vs Roach (Avon Roach Project video): <https://youtu.be/ZsMKGwiaTuQ>

On the Ivel the EA have regularly stocked modest numbers of barbel, chub and dace from their Calverton fish farm. It is not clear if barbel have ever successfully spawned in the Ivel or whether those reaching specimen proportions were all fish originally stocked by the EA. More recently the EA have stocked barbel further upstream on the Flit/Ivel Navigation around Shefford and Clifton in the hope that the habitat will prove more suitable for them to successfully spawn once they reach sexual maturity.

The IPA have a long history of cropping fish from stillwaters and stock ponds and introducing them into the Ivel. In recent years this has been predominantly roach. However, the EA now insist that all fish stocked in the Ivel must have been born and reared on fish farms and not cropped from stillwaters.

Water Quality and Quantity

Given the rapid population growth in the Ivel catchment and the somewhat archaic sewage treatment works it is no surprise that phosphate and nitrate levels are high, which gives rise to high levels of weed growth. Poor agricultural management can also contribute to unwanted chemicals entering the watercourses. It should be remembered that the catchment extends far beyond the Ivel itself and whilst the EA are responsible for the main river channel, The Bedfordshire and River Ivel Internal Drainage Board manage most of the tributaries and many ditches flowing into them.



Schematic Map of Ivel Catchment

(note river Ivel rises near Baldock, U&BOCP map wrongly labels Cat Ditch as the Ivel)

The most recent data regarding water quality, etc on the Ivel catchment and where it fails to meet targets can be found here:

<http://environment.data.gov.uk/catchment-planning/OperationalCatchment/3239>

In 2014 the EA produced a summary of information about the water environment in the Upper and Bedford Ouse management catchment:

https://circabc.europa.eu/webdav/CircaBC/env/wfd/Library/framework_directive/implementation_documents_1/2012-

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[2014%20WFD%20public%20information%20and%20consultation%20documents/UK/UK05%20Anglian/Upper%20and%20Bedford%20Ouse.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/305202/2014-20WFD-20public-20information-20and-20consultation-20documents/UK/UK05-20Anglian/Upper-20and-20Bedford-20Ouse.pdf)

For the Ivel catchment the EA identified the main reasons for not achieving good status (see chart below) and concluded "*The most significant measure in this catchment is for the water companies and private operators to improve their sewage treatment infrastructure to remove phosphate..... Owing to the number of water company treatment works needing improvement, none out of 12 were found to be cost beneficial and it is, therefore, unlikely that all 12 will be funded in the water company's next five year asset management plan*"

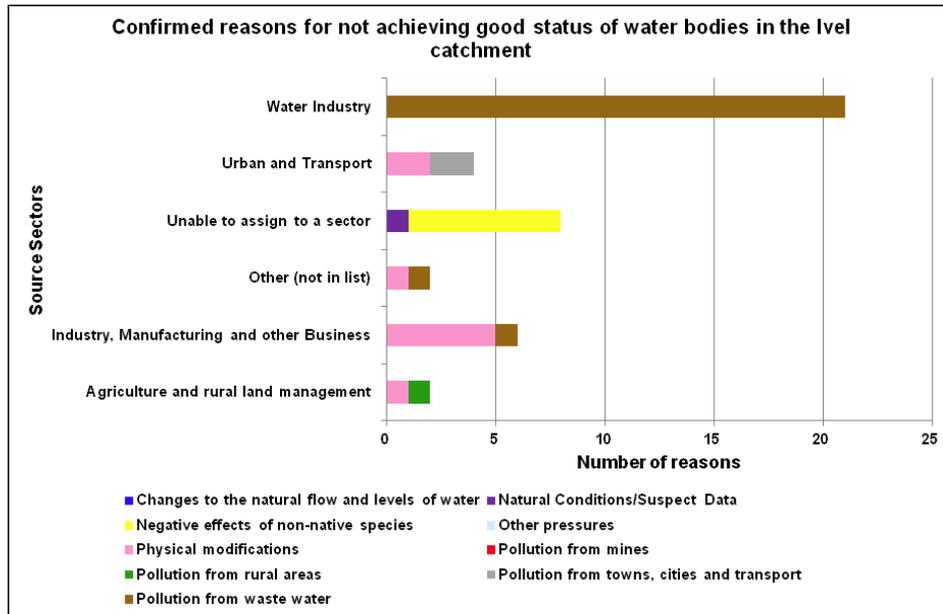


Chart showing the confirmed reasons for not achieving good status or potential of water bodies in the Ivel catchment by type and source sector

Many of the Waste Water Treatment Works (WwTWs) in the Ivel catchment outfall to headwaters, in other words they discharge to relatively short rivers with small upstream catchments and relatively low flows. This means that the potential dilution of pollutant loads from wastewater effluents may be limited, particularly during periods of low river flows. WwTWs within the Ivel catchment include Chalton (50% of Luton sewage), Flitwick, Clophill, Barton Le Clay, Shillington, Letchworth, Hitchin, Poppy Hill, Clifton, Haynes, Biggleswade, Dunton, Wrestlingworth, Potton and Sandy.

Thankfully pollution incidents leading to major fish mortality events are very rare. However, there is increasing concern about the long term chronic effects of low levels of a wide range of chemicals now found in British rivers that may have both direct or indirect negative impacts upon fish populations. It is important to ascertain if these chemicals are being monitored in the Ivel and whether any are at concentrations that have the potential to impact on fish populations.

There is compelling evidence that very low levels of oestrogen like chemicals (including natural oestrogens and synthetic analogues found in the contraceptive pill) entering rivers through sewage treatment works or from agricultural sources can have a wide range of environmental impacts, including a negative impact on the fertility of male fish. These were reviewed in this 2017 article:

<https://www.sciencedirect.com/science/article/pii/S0160412016304494>

The EA were going to help a group at Brunel University with a project looking at intersex fish as a result of oestrogenic compounds in the water. They were looking to get a sample of 50 10cm+ roach to analyse from the Ivel between Langford Mill and Broom in December 2017, but the sampling was delayed due to high water levels. Scientific studies have shown that many oestrogenic compounds can cause fish populations to crash at levels of only 5ng per litre (i.e. 0.000005 part per million; or the equivalent to 12.5mg dissolved in an Olympic size swimming pool).

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Quantifying the levels of these types of chemicals in the river poses a challenge, but it is obvious their concentrations will be highest during periods of low flow through the summer months.

There is also growing concern that several pharmaceutical products can be detected at significant levels in the effluent from sewage treatment works and the tissues of fish and otters. Recent studies suggest levels of ibuprofen found in many UK rivers may affect the fertility of male fish.

Similarly agrochemicals can leach from soils into river systems. Neonicotinoid insecticides introduced in the 1990s are now found at levels in many UK rivers that can impact on the delicate aquatic ecosystem by killing invertebrates as well as potential direct effects on fish at higher concentrations. This has led to calls for much stricter controls on this class of insecticide. Data collected throughout 2016 on the Great Ouse at Roxton showed neonicotinoid levels were consistently around 0.5ug per litre, which are above levels considered to cause chronic pollution (0.2ug per litre) but below acute pollution levels (2ug per litre).

Water abstraction has an impact on the volume of water flowing through the river system. Water is abstracted from boreholes in the chalk aquifer to supply drinking water to the Baldock area and the source of the river at Ivel Springs can often run dry. Farming interests have numerous abstraction licences, principally for crop irrigation, all along the Ivel and its tributaries.

The IPA cannot control the water quality or quantity in the Ivel. However, it is important that key individuals in the angling community are aware of the major issues and keep abreast of any developments that will have an impact (both positive and negative) on water quality and quantity. For example, major housing projects are planned for Baldock (>3,000 homes), Arlesey (2,000 homes) and Biggleswade (1,500 homes) to be built over the next 10-15 years that will place significant demands on the provision of drinking water, sewage treatment and drainage.

The EA has recently published 'State of the Environment' reports that cover the main issues regarding current and future water quality and water resources that apply across England, and are equally relevant for the Ivel catchment:

<https://www.gov.uk/government/publications/state-of-the-environment>

Habitat

When considering the habitat of the Ivel and its tributaries there is a need to recognise that the river has been heavily modified by man; initially by harnessing the river to power water mills (probably dating back to Roman times), making the river navigable in order to transport freight during the 19th and 20th centuries, and more recently sluices and flood defences have been built to protect urban areas from flooding.

The Ivel is a heavily modified waterway and many areas lack any significant tree cover over the water. There are also very few back channels or other areas where fry and fish can escape from the main flow at times of high flows. Many areas that were once clean gravel are now covered in thick layers of silt.

Many areas of the river are choked with weeds through the summer months and whilst the EA cut the weed in some areas, others are left uncut. Whilst the weed can make fishing difficult (if not impossible) during the summer, it is likely to be beneficial to the fish themselves by harbouring sources of food and providing cover.

An excellent local example of where fishing interests have influenced habitat improvements that have produced a positive outcome on the quality of the fishing is Castor Back Channel on the Nene. The EA, Wildlife Trust, land owner and angling club developed a plan to improve the habitat on 1.1km of river utilising a wide range of techniques (e.g. bank reprofiling; bank revetment using ash faggots and spiling; installation of ash faggot flow deflectors; securing in-stream woody debris; gravel introduction to augment an existing run; excavation of new fish refuges; installation of new cattle drinkers and a "dog-dip"; riverside fencing; willow pollarding; riverside tree planting to create shade) that could all be applied to the Ivel. The project cost a total of £40k and was completed in 2012. It is worth comparing the issues addressed on this project with sections of the Ivel.

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<http://www.nenevalleynia.org/wp-content/uploads/2014/08/Castor-Back-Channel-Case-Study-Final-241112-standard.pdf>

The River Restoration Centre subsequently visited the site and confirmed the project had successfully improved the habitat and areas of gravel that were once heavily silted were now clean gravel spawning beds.

<http://www.therrc.co.uk/Bulletin/Sep2014/Castor%20Back%20Channel.pdf>

Historically there have been a few isolated habitat improvement projects on the Ivel, most notably on Biggleswade Common. However, there has been no concerted effort to improve the habitat along a significant length of the river Ivel for the benefit of the fish population.

A series of meetings were held in 2014 to discuss the local River Basin Management Plan (i.e. Ivel Catchment Plan). These meetings were hosted by the Bedfordshire Rural Communities Charity and the EA, and discussed wide ranging issues affecting the Ivel. Subsequently BRCC took on the lead role for The Upper and Bedford Ouse Catchment Partnership, of which the Ivel forms only a small part. The core group members are currently BRCC, The Forest of Marston Vale Trust, The Greensand Trust, Environment Agency and Anglian Water. Although angling clubs were well represented at the initial meetings very little communication has been received about activities since. The Upper Ouse Fisheries Consultative Association are 'partners' in the U&BOCP, but unfortunately UOFA often has to be reminded that the Ivel forms part of its remit.

<http://ubocp.org.uk/catchment-plan/>

http://ubocp.org.uk/wp-content/uploads/2017/02/UBOCP_Vision_ToR_0916.pdf

U&BOCP has organised some work that was carried out on Biggleswade Common to improve habitat but we are not aware the IPA (who hold the fishing rights) were consulted; i.e. "*At Biggleswade a number of works were undertaken in partnership with the Environment Agency. This included some heavy machinery being brought in to re-profile rapidly eroding banks to draw them away from the river to reduce the likelihood of further material entering the channel, contractors also installed an engineered cattle drink and temporarily fenced off some sections of bank to exclude cattle. Volunteers then came in and installed brush bundles in a number of eroding sections, and temporarily fenced off some smaller areas. Bare banks were re-seeded and some bank side trees were planted. A length of brush bundling was installed along the old bank line where a large pool had eroded, where the channel had become over wide and where crayfish had eroded the bank. In addition a felled tree was staked in place to provide an in channel flow deflector and some rubble was moved to be added to an existing flow deflector. Monitoring continues but erosion has been reduced or eliminated in many places worked on and there is now a build-up of material re-creating the old bank lines behind the brush bundles. Clear gravel bars have formed where flow deflection has occurred and crayfish have been displaced where bundles were installed in front of their holes. Wardens continue to monitor these sections have reported that several new areas are now suffering from increased erosion. We are discussing a longer term solution with the land managers.*"

U&BOCP have also set up River Warden scheme to monitor the Ivel, but the Wildlife Trust was chosen to organise the rollout of this scheme. Again this was poorly advertised and most anglers on the Ivel know nothing about the scheme.

A totally separate exercise is the River Ivel Project set up and managed entirely by the EA in 2015 as a review of how to manage flood risk. A major part of this exercise is to review the need for each structure (sluice, weir, etc.) along the Ivel and where possible simply remove them, the argument being this will enable fish to migrate up and down the Ivel (and save the EA money in maintenance costs). So far little has happened other than a lot of expensive modelling work before the sluice at Tempsford was finally raised a few months ago and its impact is now being monitored. Removal of structures can obviously have a major impact on water levels and flow rates immediately upstream. Therefore, any major investment in habitat improvements needs to take into account future changes to water levels and flow rates.

SDAA'S PROPOSAL FOR THE IPA

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General:

- Any action plan will only be successful if key individuals can be identified who have the willingness, drive and sufficient available time to devote to the full implementation of any plan over a number of years. Such individuals are not immediately visible. Many individuals involved with the IPA are already fully stretched by the demands of their multiple volunteer roles in the running of their own clubs.
- Doing nothing is the easiest option, but further decline in the fishing on the Ivel is likely to lead to the demise of the IPA (a fate suffered by other river associations in recent times). Some IPA member clubs already fail to regularly attend some or all IPA meetings, a worrying sign for the future of the Association. A commitment to continuing IPA membership should be formally sought from all member clubs before any major new commitments are entered into relating to the long term improvement of the Ivel.
- Just stocking more fish fails to address any of the underlying issues faced by the Ivel.
- Can the IPA in future fulfil its Constitutional statement : "*The objects of the Association shall be to preserve the amenities of the River Ivel and to protect and improve its fisheries*", and if so, how?

N.B.: All points from here onwards require the active involvement of the clubs and committed individuals to turn them into reality:

- The IPA should first collate and provide documented evidence that clearly demonstrates a continued decline in fish stocks and fishing on the Ivel. This evidence should then be well publicised and circulated to key stakeholders, e.g. landowners, EA, Anglian Water, Wildlife Trust, BRCC, U&BOCP.
- Where possible the IPA (and member clubs) should use this evidence to seek future rent reductions where these have been inflated in recent years (e.g. Fen Reeves), or continuing rent freezes where rents have remained static for many years, until such time that the decline in fishing is reversed.

Predation:

- Seek advice from Jake Devoile (AT Fisheries Management Adviser) on the best strategies for reducing cormorant predation along the most popular IPA sections of the Ivel (i.e. Jordans to Sandy).
- Identify any practical methods of crayfish trapping that have been proven to lead to an increase in the natural recruitment of fish (e.g. is there any evidence that trapping around fish spawning beds has any benefit?).
- Reassure conservation groups that the Ivel is supporting a healthy number of otters and suggest to them that the future survival of the otter population will rely more on investing in habitat improvements to improve fish stocks, rather than spending money on building even more artificial otter holts.
- Discuss with conservation groups the feasibility of a co-ordinated mink eradication programme within the Ivel catchment to help re-establish water voles and preserve fish stocks. Anglers can assist by reporting mink sightings within the Ivel catchment.

Recruitment and stocking:

- Habitat improvements should include programmes aimed to improve the success of natural recruitment of fish by creating more areas of clean gravel to act as spawning beds for dace, chub and barbel and greater natural cover and shelter from high flows to enhance fry survival. It should be noted that other species such as roach, perch and bream lay their eggs in weedy areas, the fibrous roots of willow trees or similar material.
- For chub, perch and pike it would appear no supplemental stockings are required as natural recruitment for these species appears to be sufficient to maintain healthy populations.
- The priority species for supplemental stocking should be roach. Where possible these should be stocked each spring in numerous locations within the most popular IPA sections of the Ivel (i.e. Jordans to Sandy). The IPA could try and negotiate a long term breeding

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programme with a reputable fish farm. Another option is to set up an Ivel Roach Project, whereby eggs are collected from the river, hatched, grown on in stock ponds and released back into the river. This would require a team of dedicated volunteers or it may be a project Shuttleworth College might be persuaded to take on. It is also worth asking the EA whether they would accept farm reared roach fry to be grown on in dedicated IPA stock ponds before being health checked and released into the Ivel.

- There appear to be no commercial supplier for dace so supplemental stocking by the EA or natural recruitment are the only options.
- Although barbel have been observed spawning on the Ivel there appears to have been little (if any) success in natural recruitment to date. Therefore, their long term survival in the Ivel will depend on supplemental stocking by the EA. Anglers will have to accept that with otters present it is unlikely barbel in the Ivel will challenge the UK record in the foreseeable future.
- Bream are a 'nice to have' species but supplemental stocking should have low priority compared with the species highlighted above.
- If flow rates significantly increase in the longer term as structures are removed the IPA could consider requesting the introduction of grayling.

Water quality and quantity:

- Information about water quality (i.e. what is in the water) and quantity (e.g. abstraction licences) is often available, but often difficult to locate. Data specific to the Ivel catchment should be collated and disseminated to IPA clubs. Freedom of Information requests should be made to locate any data not in the public domain. A database of relevant information should be maintained.
- These data can then be used to lobby relevant agencies to make improvements (e.g. removing phosphates at WWTWs) or to proactively comment on proposals for new housing developments, applications for water abstraction, etc.
- The IPA should request data from the EA on the levels of oestrogenic compounds in the Ivel catchment and any studies on the fertility of male fish in the Ivel, i.e. whether oestrogen like compounds are at levels that are having a negative impact on natural recruitment.

Habitat:

- Using the Castor Back Channel project as a successful model, work with landowners (Biggleswade Town Council, Shuttleworth, Fen Reeves), EA, Wildlife Trust, River Restoration Centre, etc to develop a plan for comprehensive habitat improvements along the most popular IPA stretches (i.e. the Back Meadows and the upstream section of Biggleswade Common).
- Elsewhere seek approval to plant trees and bushes along the bank side to create cover and refuges on all waters where grazing animals do not have access.
- Where possible encourage landowners to fence off large sections of river so grazing animals cannot damage the bank or eat newly planted trees and bushes.
- In partnership with land owners, the EA (and other relevant bodies) identify where back channels can be created and ditches widened for fry and fish to use as refuges away from the main flow.
- The IPA should engage in a discussion with the EA on a long term plan for weed cutting, which reduces flood risk but at the same time retains significant amounts of weed cover for fry and fish (e.g. limit cutting to 50% of the width of the channel). The IPA should first seek out any scientific evidence that relates to weed cutting and the impact on fish stocks.
- The IPA should ensure that invasive non-native species are highlighted to relevant agencies to ensure they do not become established. E.g. everyone should be on the lookout for the first signs of Floating Pennywort. Himalayan Balsam is already rampant through much of the Ivel catchment. Parrots Feather has been present at Stotfold Mill for some years but no one has taken responsibility to eradicate it. Signal crayfish and mink have been discussed elsewhere.