Wensum Fish Survey analysis and comparisons
EA Surveys from 1983 – 2025

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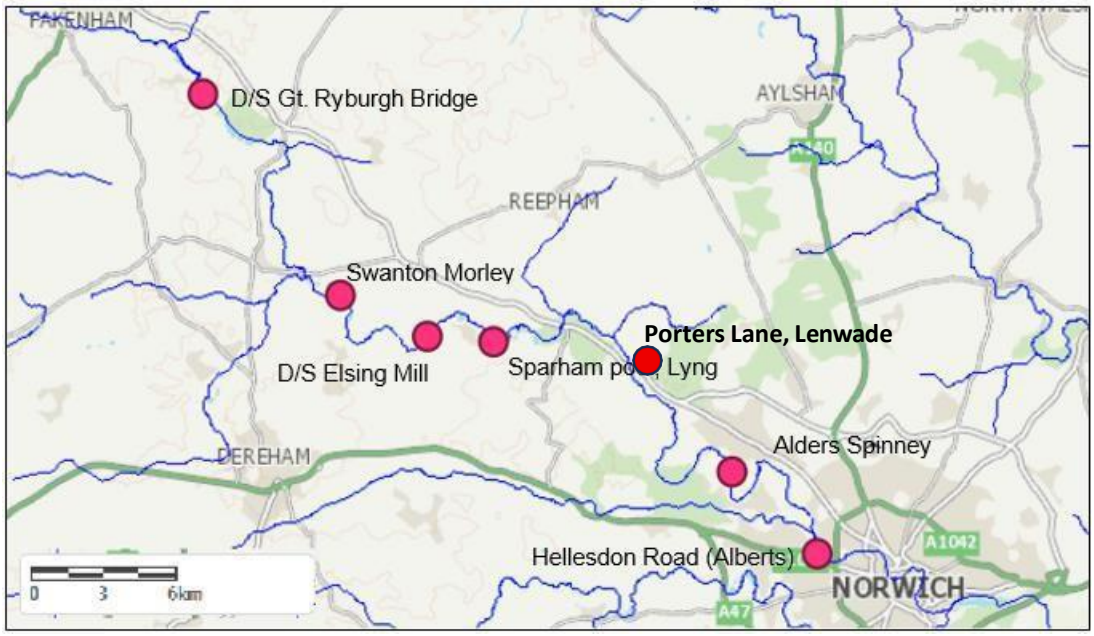
Issue 3C

Locations



Summary

This report looks at 35 years of fish surveys undertaken by the Environment Agency on the River Wensum and looks at two comparable rivers in East Anglian for comparison on both Density and Biomass. It then explores the environment factors between the 3 rivers. It has been updated to reflect surveys undertaken from 2020 to 2025.

All sites were surveyed using EA electric fishing methodology with a minimum of 2 separate passes at each site to measure catch depletion. Capture efficiency using electric fishing methods is less effective for fish below 99 mm FL. Historically fish over 99 mm FL are used to generate report data and estimates. This report uses this protocol and concentrates on 6 key species of fish and includes fish with a fork length of greater than 99mm. It also now includes the two designated species of Bullhead and Brook Lamprey.

The survey data uses an algorithm known as Carle & Strubb to overcome inconsistences and variance across the surveys, these are applied to the measures on density. The density per 100m² is normalized using the recorded survey area in m² and multiplying it by 100.

In recent years data on weights are not recorded, so biomass results have been excluded,. However group analysis by species and recorded length have been added for across all surveys to obtain a greater sample count.

The EA has provided the base data for this report, from their archives. Since 2020 these surveys are held within the Environment Agency Ecology & Fish Data Explorer. The Wensum data has since been further validated and verified, removing some years when complete data wasn't available. This completes an attempt to compile historic trends and comparison to comparable rivers like on the Upper Ouse and River Gipping to the Wensum. But no two rivers have the exact ecology and makeup. So this is more of a reference than a scientific comparison.

Figure 1

The graph captures the total fish caught during each survey and trend volume.

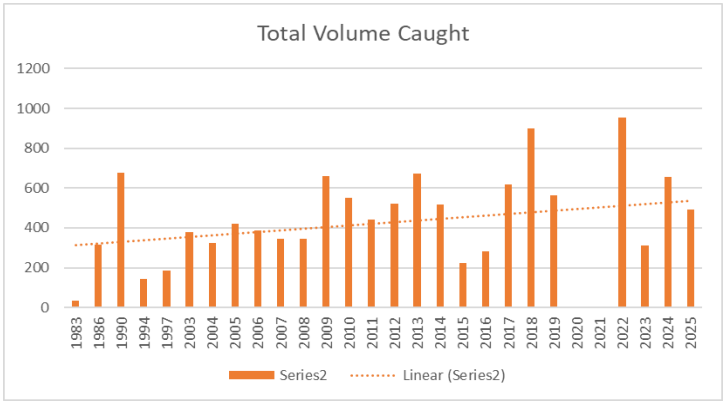
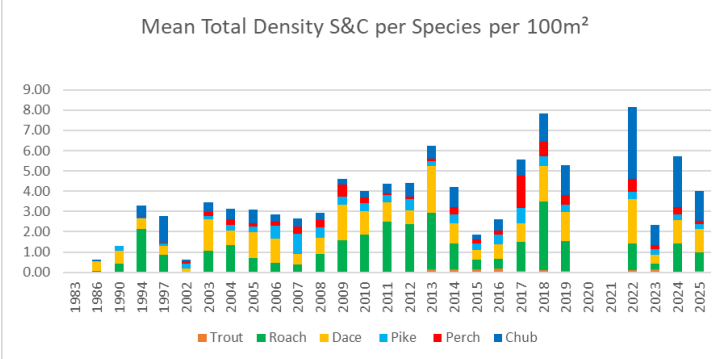


Figure 2

The graph captures the mean numbers of fish species per 100m².

Roach and Dace are clearly on average the dominate species. With an increase in Chub populations in some areas.

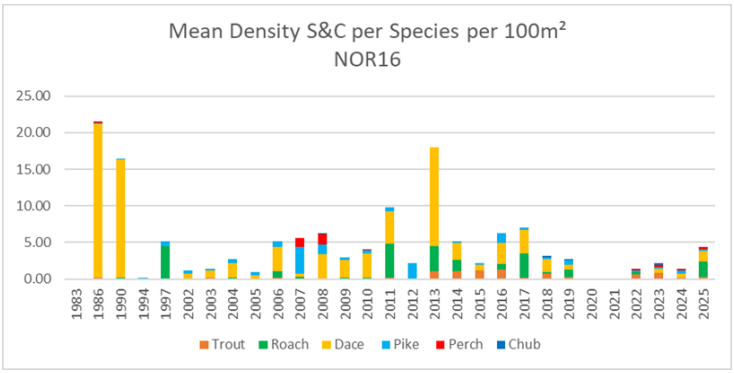


Analysis by Reach

NOR16

D/S Great Ryborough Bridge

Dace appear to the dominant species.

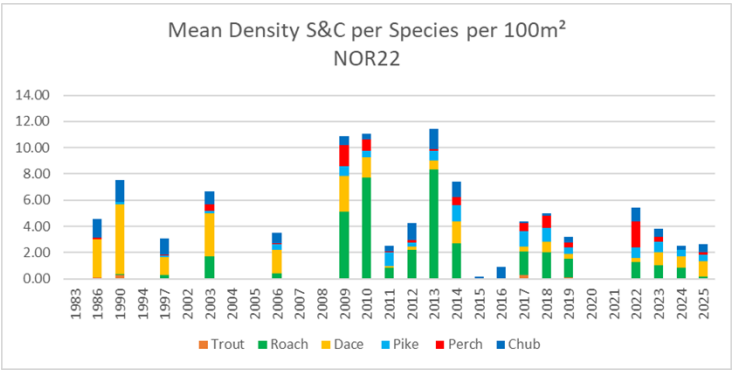


NOR22

Swanton Morley

Clear evidence of the Roach stocking program at this location between 2009 – 2012.

Roach appear the dominant species particularly from 2009-2019, but have since normalised to low numbers.

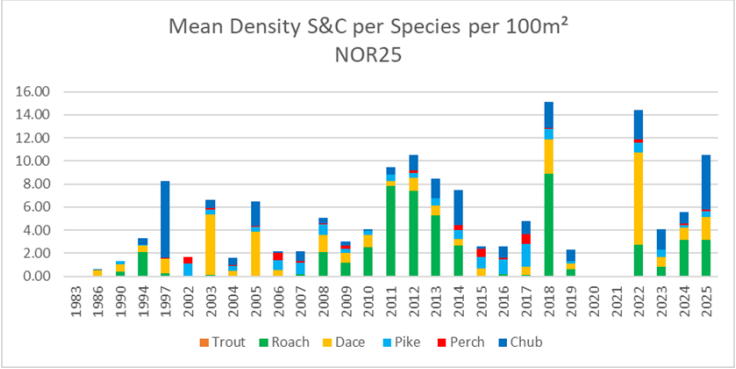


NOR25

D/S Elsing Milll

This shows the upstream stocking program with the fish moving past Elsing Mill.

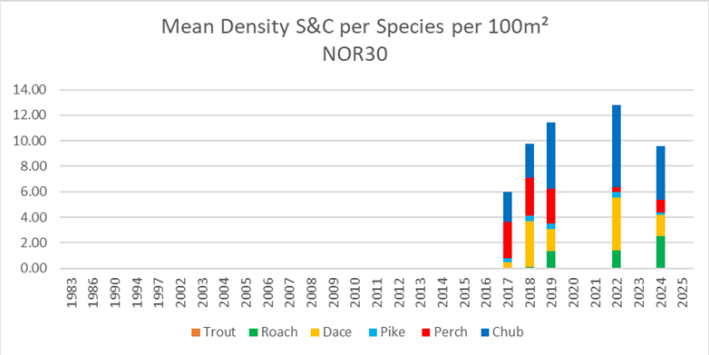
Dace have been overtaken by Roach as the dominant species.



NOR30

Sparham Pool, Lyng

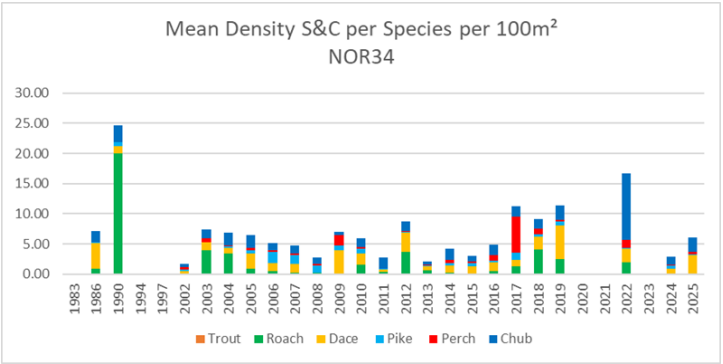
This is a relatively new survey location, with little trend over time. One of the strong areas containing Perch, but dominated by Chub.



NOR34

Alders Spinney

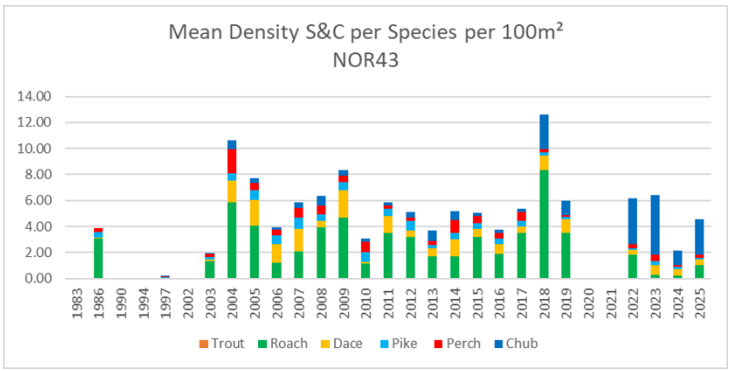
There appears to be a change in species balance across the survey. Chub seem to be the dominate species.



NOR43

Hellesdon Road (Albert's)

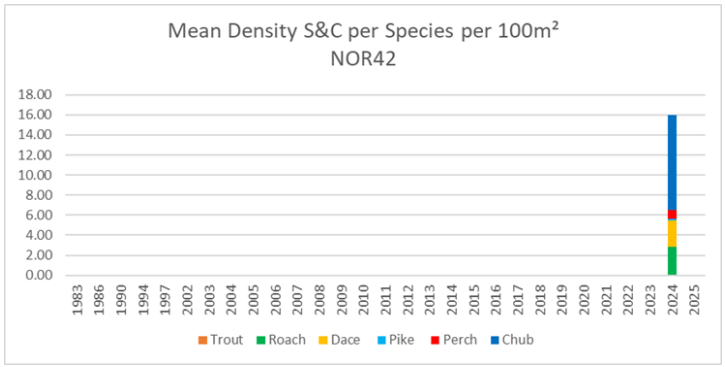
Roach have maintained a strong presence until 2020, when they seem to have struggled. Chub now being the dominate species.



NOR42

Porters Lane Bridge Lenwade (New)

This area was subject to a survey in 2024, which proved very successful in terms of results. One of the best surveys undertaken on the whole Wensum, with over 8 species caught.
It demonstrates that giving the right habitat and management , fish stocks can be supported.
It should be noted that this section of the river is privately owned and managed, to a tight habitat regime.

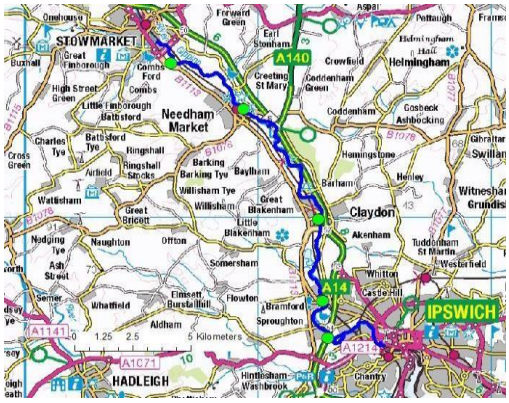


Comparable Survey to the Upper Ouse[i] and River Gipping[ii]

Comparing directly several years of surveys from 2003 to the most recent results between the Upper Ouse, River Gipping and the Wensum. It takes an average across multiple sample sites forming a long term trend, using the same standard techniques. .

The sites used on the Gipping are Sproughton, d/s Bramford Lock, Station Road Bridge, Needham Market and Stowmarket, as shown on the map below left. The sites used on the Ouse are: Newport Pagnell, Clifton Reynes and Turvey as shown on the map below right.

The comparison graphs and table below show the actual data.



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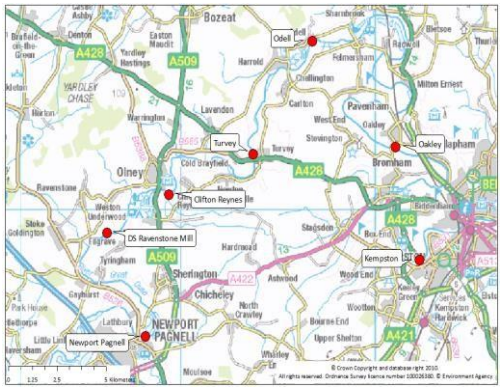
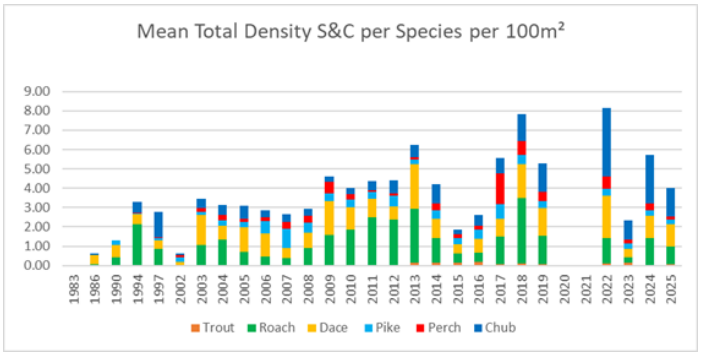
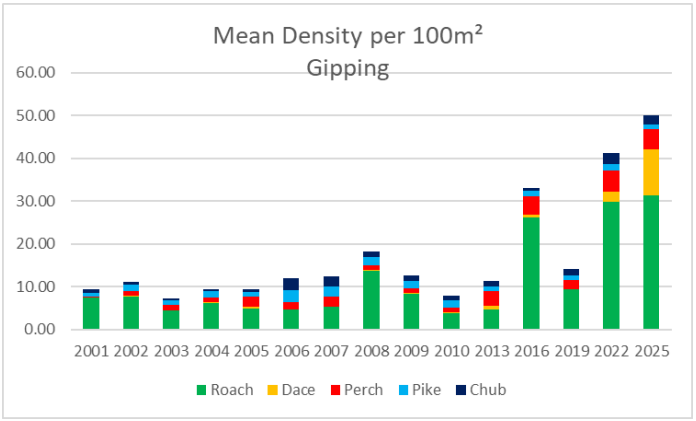
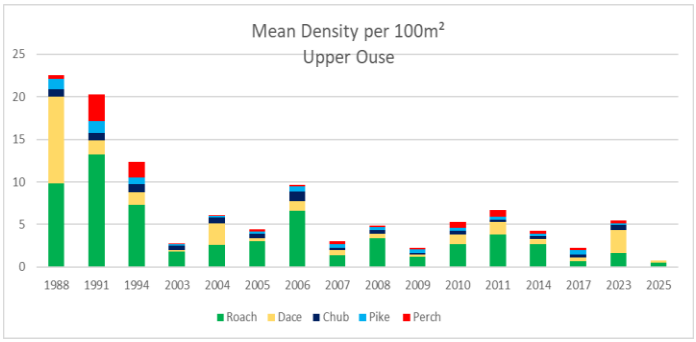
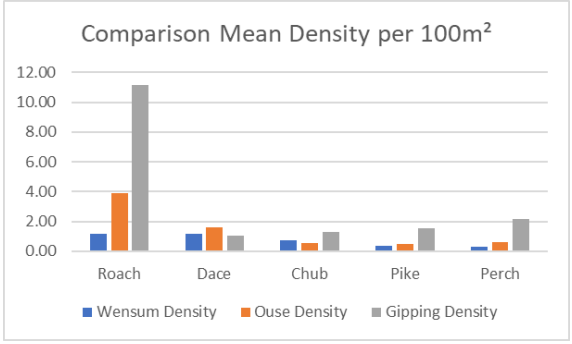








It is very evident that Roach in the Gipping are 10 times more dense than within the Wensum and in the Upper Ouse they are nearly 3 times more dense than within that of the Wensum. Only Dace seem more abundant as a species within the Wensum. These are some significant variances and cannot be dismissed. The Gipping Roach density is slightly influenced by the significant 3 most recent catches which has now materialized across all sites.



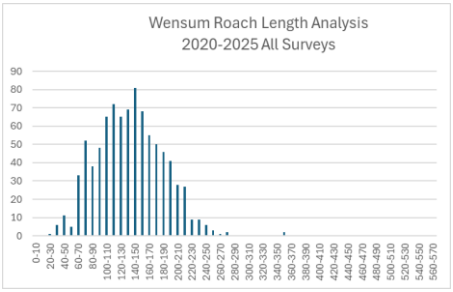
Mean Species	Wensum Density	Ouse Density	Gipping Density
Roach	1.15	3.90	11.18
Dace	1.14	1.60	1.07
Chub	0.75	0.56	1.32
Pike	0.33	0.49	1.53
Perch	0.27	0.62	2.17

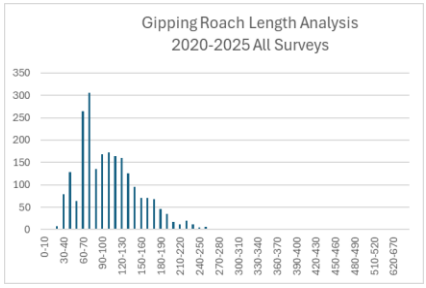
These surveys are an extract science and are subject to environmental conditions and fish behavior's, However they do provide some level of evidence on the general fish density and year class distribution.

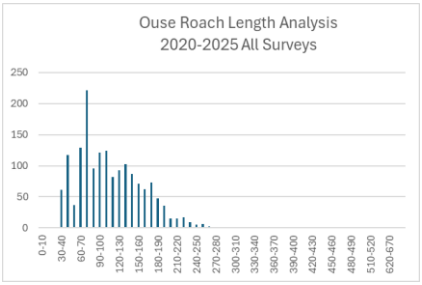
Fork length analysis and year class distribution

Survey data now stored within the EA Ecology explorer platform, do list the lengths of each specific fish caught.

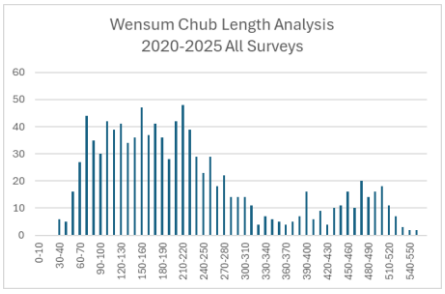
I have grouped these Surveys into species across the past 3 years and all sampling locations to provide a more realistic sample size per length, grouped into 10mm segments. This gives sight of year class distribution for fish lengths ranging from 0mm to 2000mm and the respective variances in year class distribution between the surveyed rivers..

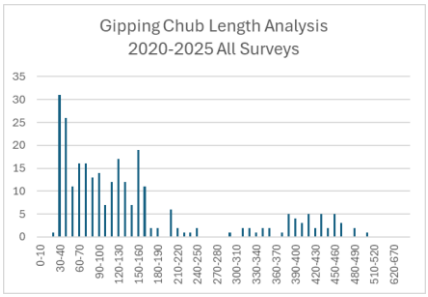


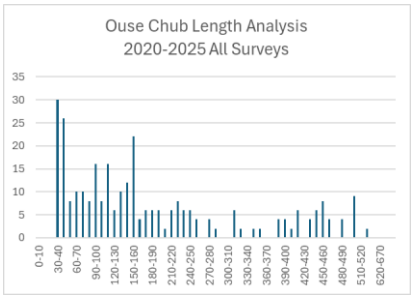




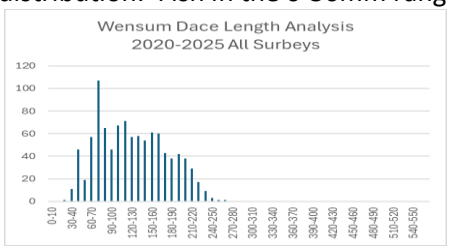
Wensum Roach are clearly struggling with recruitment compared to the other rivers. Fish in the 0-50mm range is only 3% compared to 13% on other rivers.

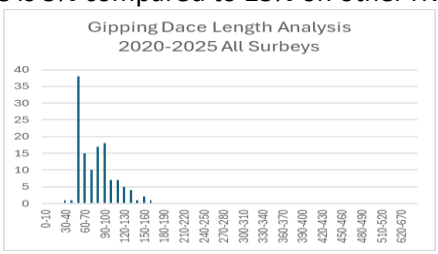


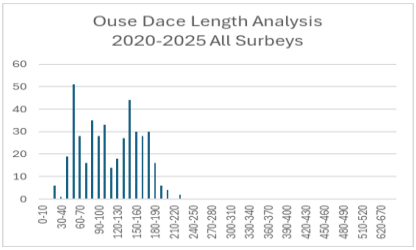




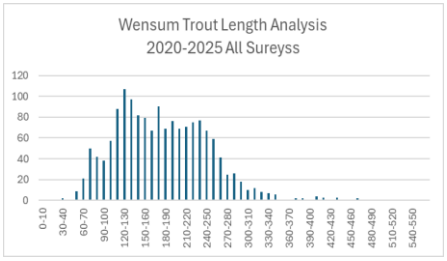
Wensum Chub are clearly struggling with recruitment compared to the other rivers but do have an average year class distribution. Fish in the 0-50mm range is 3% compared to 23% on other rivers.

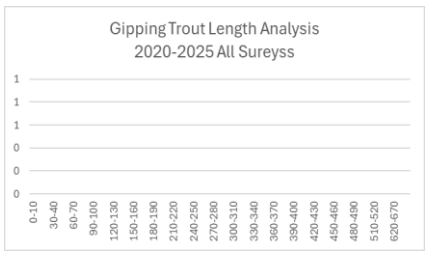


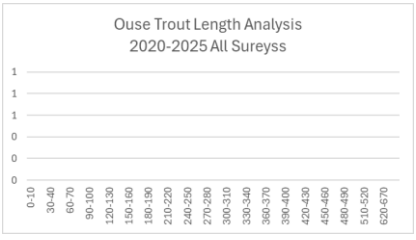




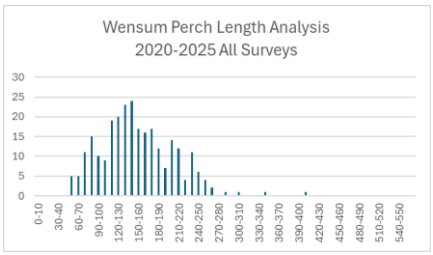
Wensum Dace do seem to reflect lower recruitment than seeing across the other rivers. Fish in the 0-50mm range is 8% compared to 18% & 31% on other rivers.

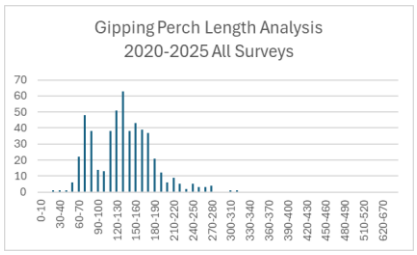


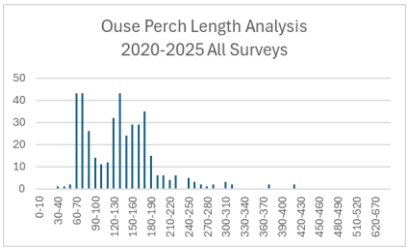




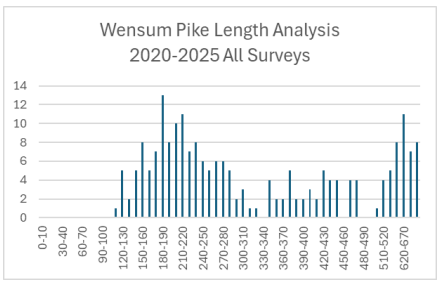
No Trout were caught in the others rivers to compare. But only 1% of trout caught were below 50mm in length, but it is good that Brown Trout seem are able to naturally spawn in the Wensum.

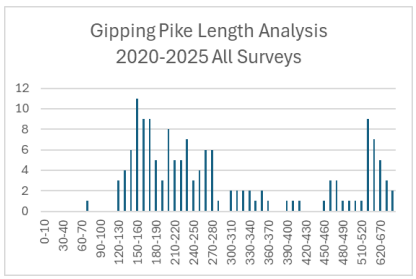


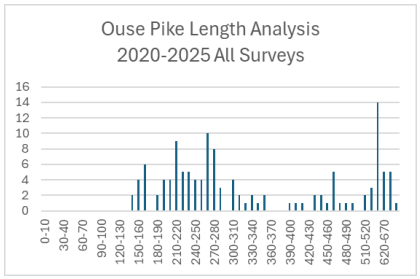




Perch seem to struggle with recruitment across all rivers, in the last 5 years.





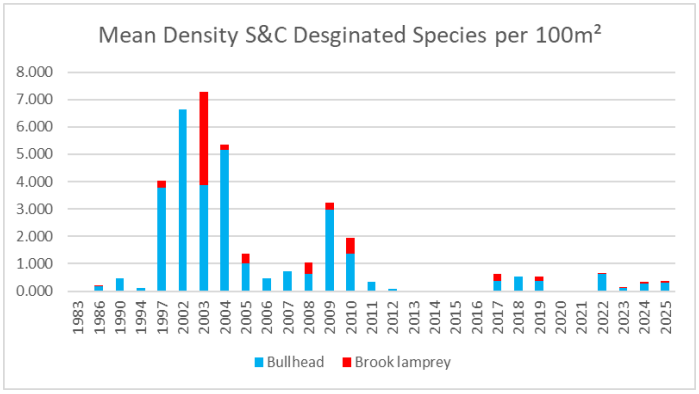


Wensum Pike are comparable to the other rivers and have an average year class distribution.

Designated Species

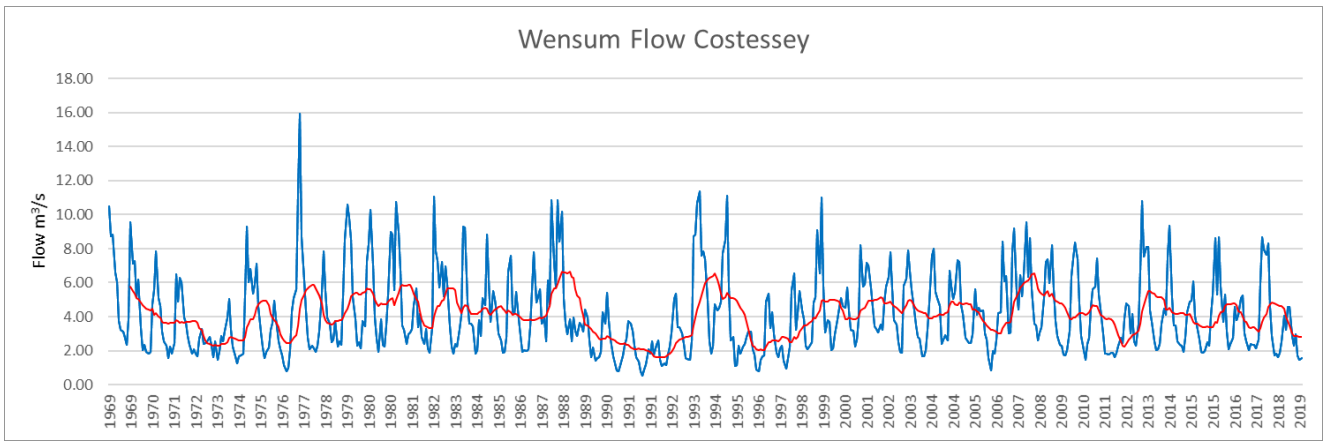
Two species are designated within the SSSI and have therefore been added to the analysis.

Bullhead seems to be in much lower numbers compared to the early 20's, whilst Brook Lamprey only appear in small numbers across the entire survey period.



Historic Context Flow

Flow rates also seem to show no specific trend from 1969 to today. As shown in the graph below taken from UKCEH model[iii] For all 3 river gauging stations, there appears little annual variance over time in flows. However Natural England have enforced some Wensum abstractions changes following a review in 2010 for implementation in AMP6 2013-2018. This review used 3 monitoring points Fakenham, Swanton Morely and Hellseden.



It enforced some significant abstraction changes impacting both Fakenham and Hellesden , in the past decade. When Comparing flows using a flow duration curve, there is some apparent change over time. See figure 3.

A further review was planned in 2024, with the SSSI assessment report of July 2025 stating over Abstractions was a significant issue impacting the river.

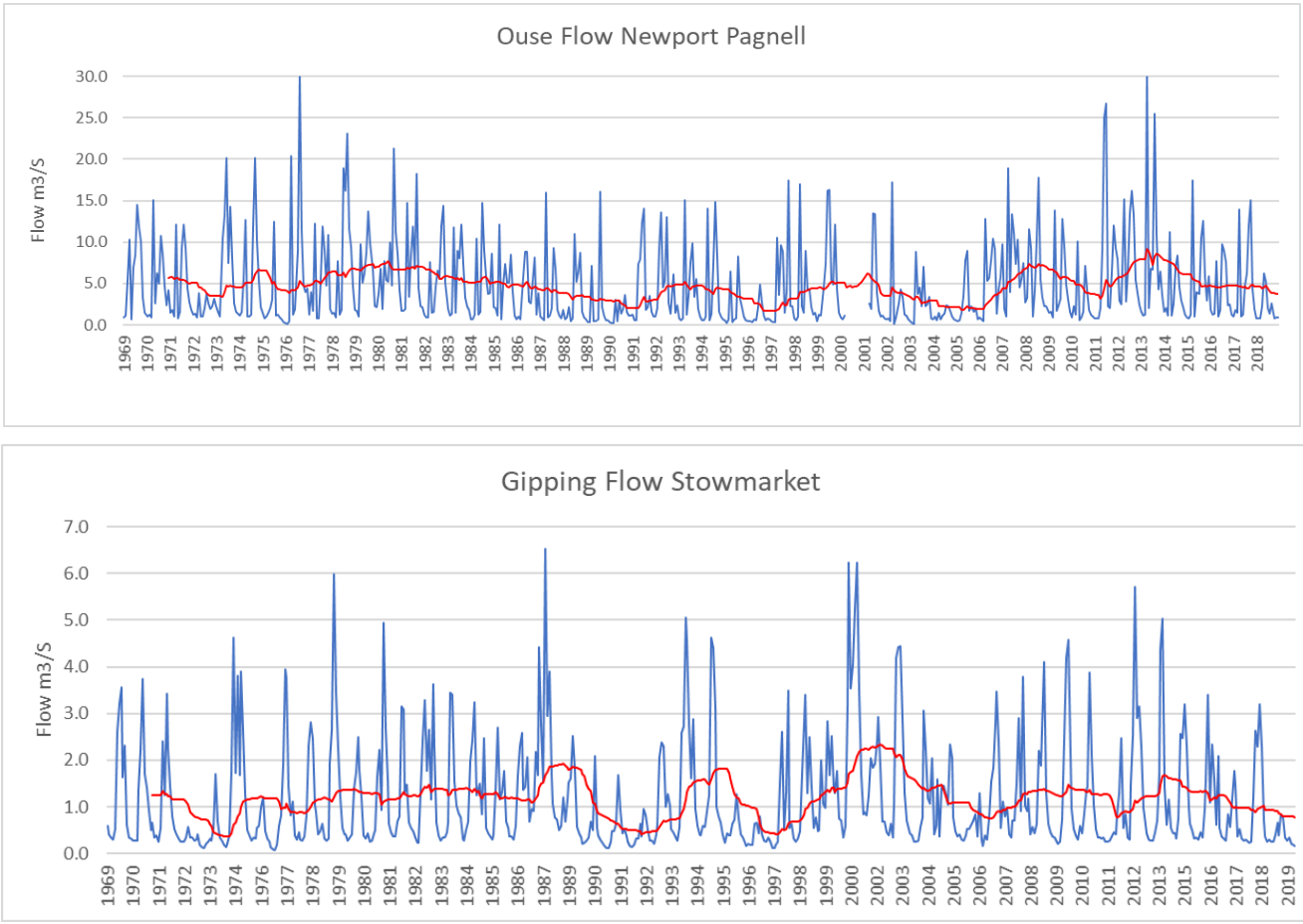
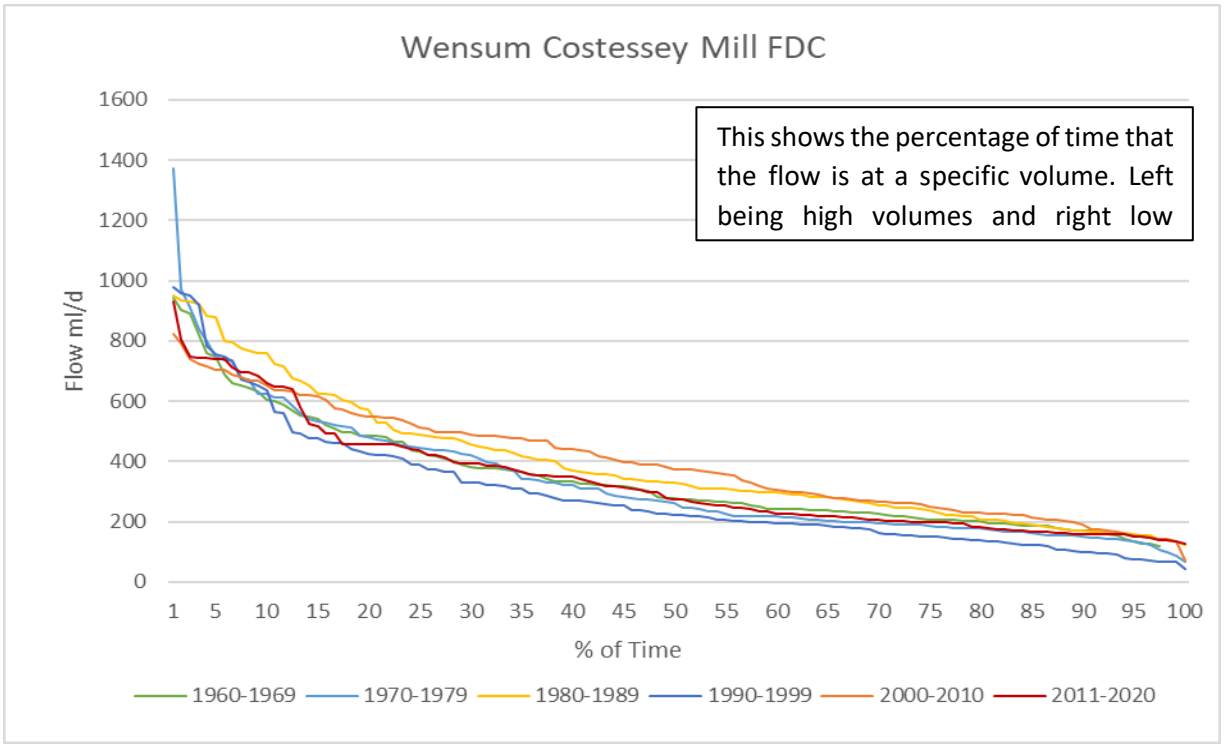


Figure 3

You can see over time how flow variance has impacted on the river, particularly apparent in the period 1990-1999. This is primarily related to the AWS abstraction point, as it moved to Costessey.



Historic Context Chemical Analysis

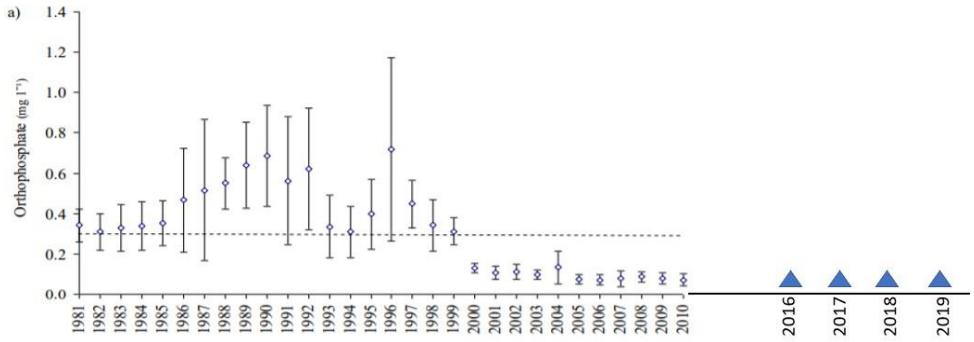
https://environment.data.gov.uk/water-quality/view/sampling-point/AN-WEN180

https://environment.data.gov.uk/water-quality/view/sampling-point/AN-GIP130

https://environment.data.gov.uk/water-quality/view/sampling-point/AN-05M03

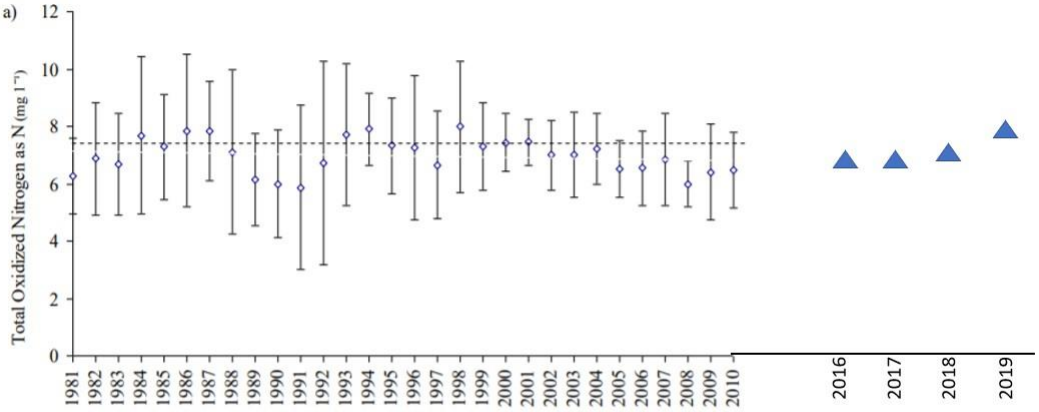
Chemical values seem comparable across the 3 rivers, apart from Orthophosphate which appear 10 times higher on both Ouse and Gipping and reflects the additional measures introduced to protect the Wensum SAC.

Wensum long term trend Orthophosphate



Source 1981 – 2010 http://eprints.bournemouth.ac.uk/20684/2/Beardsley%2CHelen_M.Phil._2012.pdf
2016 – 2019 https://environment.data.gov.uk/water-quality/view/download

Wensum long term trend Nitrogen



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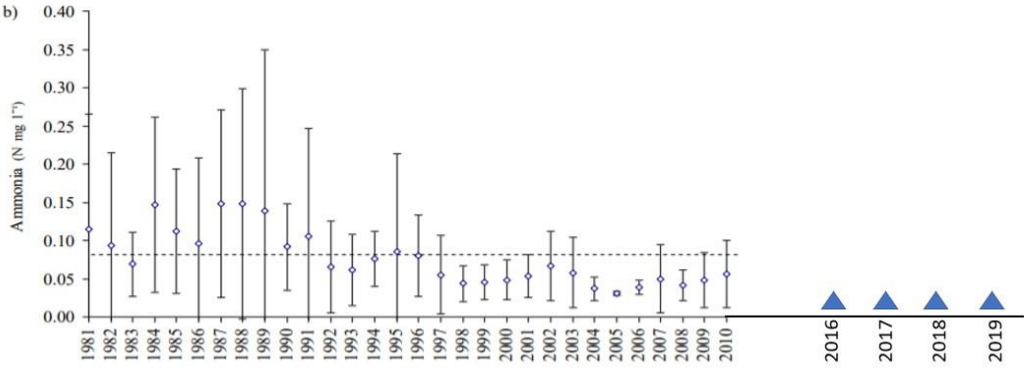
2016 – 2019 https://environment.data.gov.uk/water-quality/view/download

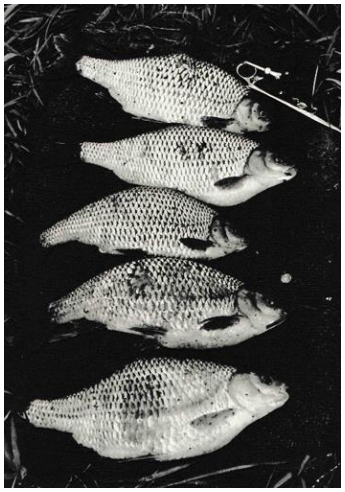
Wensum long term trend Ammonia



Source 1981 – 2010 http://eprints.bournemouth.ac.uk/20684/2/Beardsley%2CHelen_M.Phil._2012.pdf
2016 – 2019 https://environment.data.gov.uk/water-quality/view/download

Historic Context Roach and Anglers Catches

The overall Roach density hasn't really changed over the past 30 years, with some peaks showing the impact of stocking at Swanton Morley, which shortly fell into decline. Seemingly no formal records exist from the heady days, when the Wensum was deemed Britain's best Roach river on the late 70s.

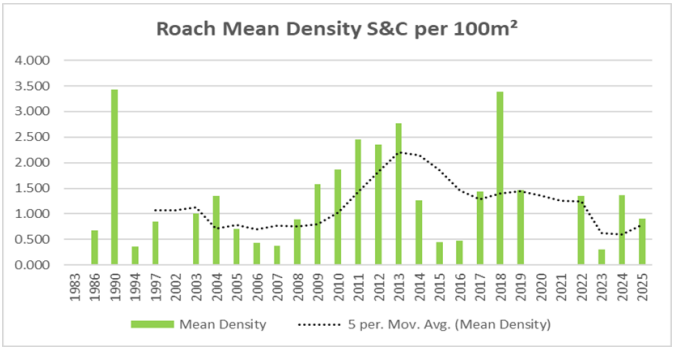


As shown left from the archive of the late Terry Houseago. 5 fish of 2lb 5oz to 2lb 15oz caught on the Wensum.

Adding in a 4 year rolling trend, demonstrates Roach levels have returned to their previous densities of two decades past.

Indeed the evidence shows that the river can't hold any form of Roach density above 1 fish per 100m² in its current form.

The river is certainly unable to support any sustainable growth to that seen in the 70's. Indeed the recent survey data reflects the ability to recruit many species compared to the Rivers Gipping and Upper Ouse.



Much study has been undertaken over the last two decades looking at the demise of Wensum Roach, with a detailed thesis named "Factors affecting the growth and recruitment of cyprinid populations of the River Wensum, Eastern England, with special reference to roach Rutilus rutilus (L.)" by Helen Beardsley in 2012.[v]

This paper references to many previous studies, but its conclusion reads "In summary, the growth rates of these three cyprinid fish were revealed to be significantly variable over time, with much of this variability in roach able to be explained by environmental parameters, especially temperature, and in more recent years, by a shift to less eutrophic conditions. This roach growth suggests the anthropogenic pressure of organic enrichment (and reversal) was an important driver of change, with shifts in water quality potentially having important ecological consequences for fish populations that may then negatively impact aspects of fishery performance."

A more recent review of the three key chemical elements, shows little has changed from that of the period between 2000-2010. So that's two decades without any form of natural recovery.

Older anglers amongst us today have memories of the Wensum being abundant with large 2lb Roach, like the picture from the mid seventies caught by the late Terry Housego.

The UK Roach population was decimated by the columnaris outbreak in 1967 which devastated the roach population. There was a period after this when a number of Wensum survivors and their progeny grew to exceptional sizes, but by about the mid – late eighties both numbers and ultimately sizes of roach in the river had finally dwindled to a fraction of what they once were and ultimately reflected in the graphs shown earlier in the document.

Conclusion

The Wensum does have some significant shortages of Roach stock, when compared with similar comparable rivers. One has to ask what is the optimum stock of Roach and should it be higher to enable any form of self-sustainment and recovery. The evidence in these surveys seems to indicate things aren't getting better for fish recruitment.

So, what has changed and impacted on Roach stocks?

A number of significant changes have happened since the 70's.

- Seemingly reduced flows caused by additional abstraction regimes. (However not evidenced by data)
- IDB drainage of the wider catchment area
- Adjacent gravel workings and loss of connected flood plan
- Loss of off channel connectivity and fry refuge
- Significant reduction in Sewage outflows of Phosphates
- Significant increase in non-native signal crayfish
- Seemingly unmanaged mill structures
- A growing list of chemicals and pesticides entering the river.
- Poor engagement from the statutory bodies in the last decade

The Wensum Catchment Partnership continues investigating all forms of connectivity to the river, to understand off channel habitats and spawning locations, if any exist for Roach. But given the long term trend of over 30 years, it appears that nature will require a helping hand to recover to any form of comparable stock levels to be reached.

Once these investigations are concluded, a management plan and options appraisal will be produced for stakeholder agreement to restore it back to something akin to a comparable chalk stream river.

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[i] https://environment.data.gov.uk/ecology/explorer/
[ii] https://environment.data.gov.uk/ecology/explorer/
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[iv]
[v] http://eprints.bournemouth.ac.uk/20684/2/Beardsley%2CHelen_M.Phil.___2012.pdf