

# Hydroacoustic fish population survey

## The Relief Channel

30<sup>th</sup> July 2024

This report provides a summary of results from our recent hydroacoustic fish population survey of the Relief Channel between Denver and Saddlebow. The survey was carried out to assess the health of the river and enable successful management of our principal fisheries.

This survey was not completed in 2024 as mechanical failure of the survey boat meant that only the downstream survey pass could be undertaken.



Image 1: The Kingfisher at Denver Lock.

## Summary

- The Relief Channel was surveyed on the 30<sup>th</sup> July 2024 using hydroacoustic sampling methodology. A single pass was conducted before mechanical failure caused sampling to end.
- A full downstream pass was completed, and this recorded fish densities that ranged between 2.1 and 136.7 Ind./1000m<sup>3</sup> with an average population estimate of 29.8 Ind./1000m<sup>3</sup>.
- The 2024 density estimate remains above average when compared against the long-term density value of 24.4 Ind./1000m<sup>3</sup> (derived from surveys between 2010 and 2023) but represents a 26% reduction in density since 2023.

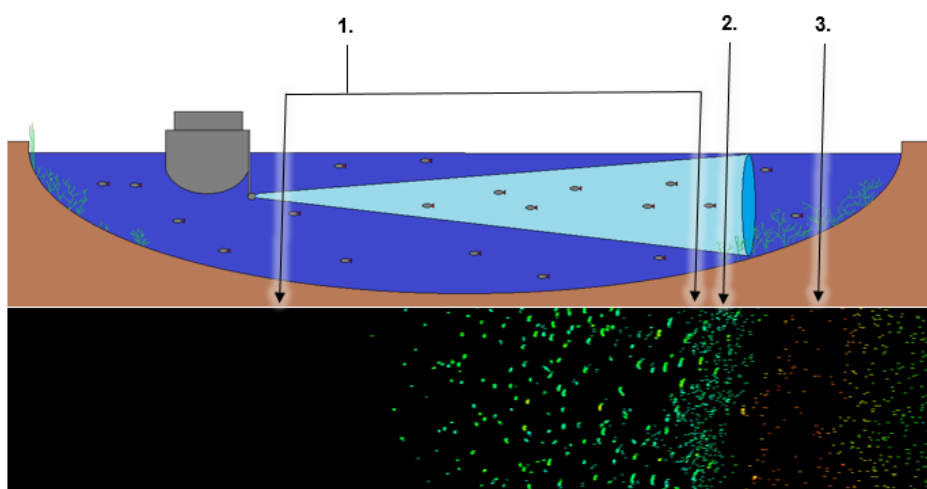
## Survey technique

- Our hydroacoustic survey technique utilises sound waves (pings) that are fired across the river channel at a rate of 10 'pings' per second. These 'pings' are reflected to the transducer from objects within the 4m x 10m elliptical beam.
- When struck by the acoustic beam, solid items such as the far bank, bridge supports, and riverbed reflect extremely strong returns; echoes from fish give a moderate return and surface scatter reflect a much weaker echo (See Image 5 overleaf).

- The survey boat travels at 6 km/Hr along the edge of the marginal shelf. Positioning the boat in this way helps avoid submerged macrophyte growth which may otherwise become wrapped around the sounder unit obscuring the acoustic beam or, at the very least, reduce sample range.
- Hydroacoustic surveys are conducted at night since fish are distributed more evenly throughout the water column during darkness and this allows them to be easily distinguished from reflected substrate and bankside 'noise'.
- After the survey is complete the data is post-processed, and output is provided as a fish density estimate expressed as individuals per 1000m<sup>3</sup> (Ind./1000m<sup>3</sup>) and can also be displayed as density groupings via map format and these are provided at the back of this report (**Maps 1 & 2**)

**Image 2:** Simplified image of the hydro acoustic survey technique.

1. Open water and clearly visible fish echoes.
2. Limit of the 'usable' data surface scatter (light blue) and echoes from rooted plants (light green).
3. Heavy (red and brown) echoes from marginal slope and riverbank.



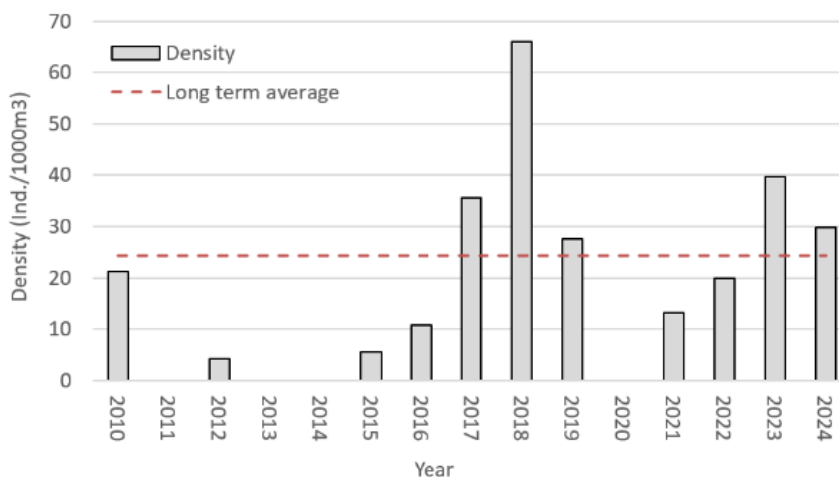
## Results

The Relief Channel was partially surveyed on the 30th July 2024 using hydroacoustic sampling methodology. Unfortunately, engine failure meant that the survey had to be abandoned with only the first run undertaken.

As the data collected may still be of interest to the angling community, this brief report has been written to detail our findings; however, such incomplete results are not suited for meaningful comparison with our historic dataset and the report should be viewed with this in mind.

Fish density was found to range between 2.1 and 136.7 Ind./1000m<sup>3</sup> with an average value of 29.8 Ind./1000m<sup>3</sup> which suggests the current population exceeds the long-term average of 24.4 Ind./1000m<sup>3</sup> but also indicates a short-term reduction of 26% since the 2023; however, as already stated, this is an unreliable comparison due to the partial survey on which this analysis is conducted. **Figure 1** (above) displays population estimates collected between 2010 and 2024 plotted against the long-term average value.

**Figure 1:** Population density values between 2010 and 2024



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## Stock Distribution

The results of our 2024 survey indicated that the lower-middle reach of the channel around Magdalen Bridge held the largest number of fish which represents a quite different pattern to the preceding survey, when the fish appeared to favour the channel upstream of Stow Bridge and downstream of the Polver Drain.

- Fish density exceeded 80 Ind./1000m<sup>3</sup> immediately below Denver sluice and the survey identified further localised shoals upstream of Downham Market Bridge (**Image 3**); however, fish then appeared scarce throughout the 1.5 kilometre downstream of Downham Market Bridge.
- Fish numbers began to increase near Dolvers Farm, growing steadily towards Stow Bridge and eventually peaking near Magdalen Bridge in the perennially consistent area known locally as the 'Golden Mile' where fish populations reached a maximum of 134 Ind./1000m<sup>3</sup>.
- Fish density decreased between Magdalen Bridge and the Polver Drain outfall before rallying once more around Stow Bridge (81 Ind./1000m<sup>3</sup>) and then returning to moderate densities of around 20 Ind./1000m<sup>3</sup> until reaching the Tail Sluice.
- **Figure 2** (below) displays density data collected throughout the transect.

## Conclusions

The failure to complete the 2024 survey is disappointing; unfortunately, the survey could not be rescheduled as the boat is a shared asset and other teams needed to use the vessel once repairs were completed.

The single transect found fish density averaged 29.8 Ind./1000m<sup>3</sup> which *suggests* a population that exceeds the long-term average. The data also *indicates* a 26% reduction in density since the 2023, our subsequent survey (in 2025) will help determine the validity of these results.

It is fortunate that one complete pass *had* been undertaken before the breakdown occurred and it is hoped that the data collected, and the information contained within this brief report, remains of some interest to the angling community and other interested parties.

It would be interesting to receive feedback on how anglers have fared fishing the channel in 2024, and particularly, how well the distribution of stock recorded during our survey is reflected in fishery performance that has been experienced.

Justin Mould

Analysis and Reporting

15/08/2023

Figure 2: Fish density recorded between Denver Sluice and the Tail Sluice - July 2024

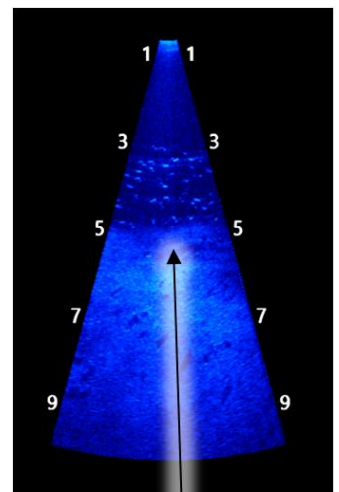
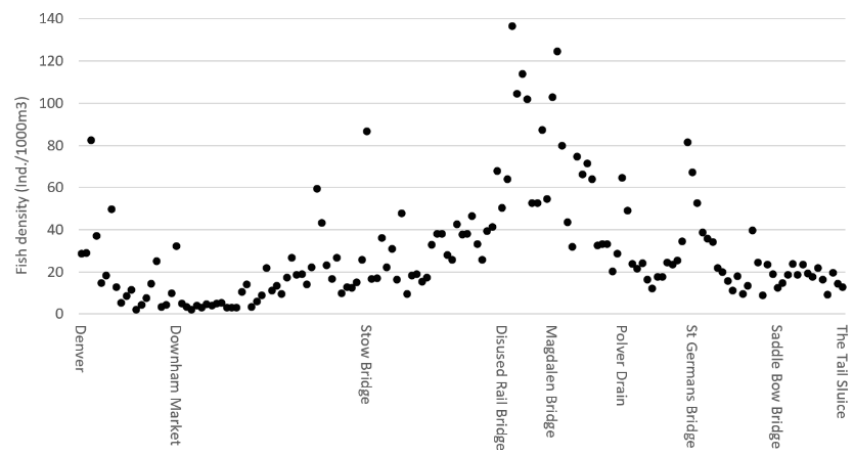


Image 3: Fish shoaled at Downham Market Bridge

The Relief Channel will next be sampled by hydro acoustic techniques in 2025

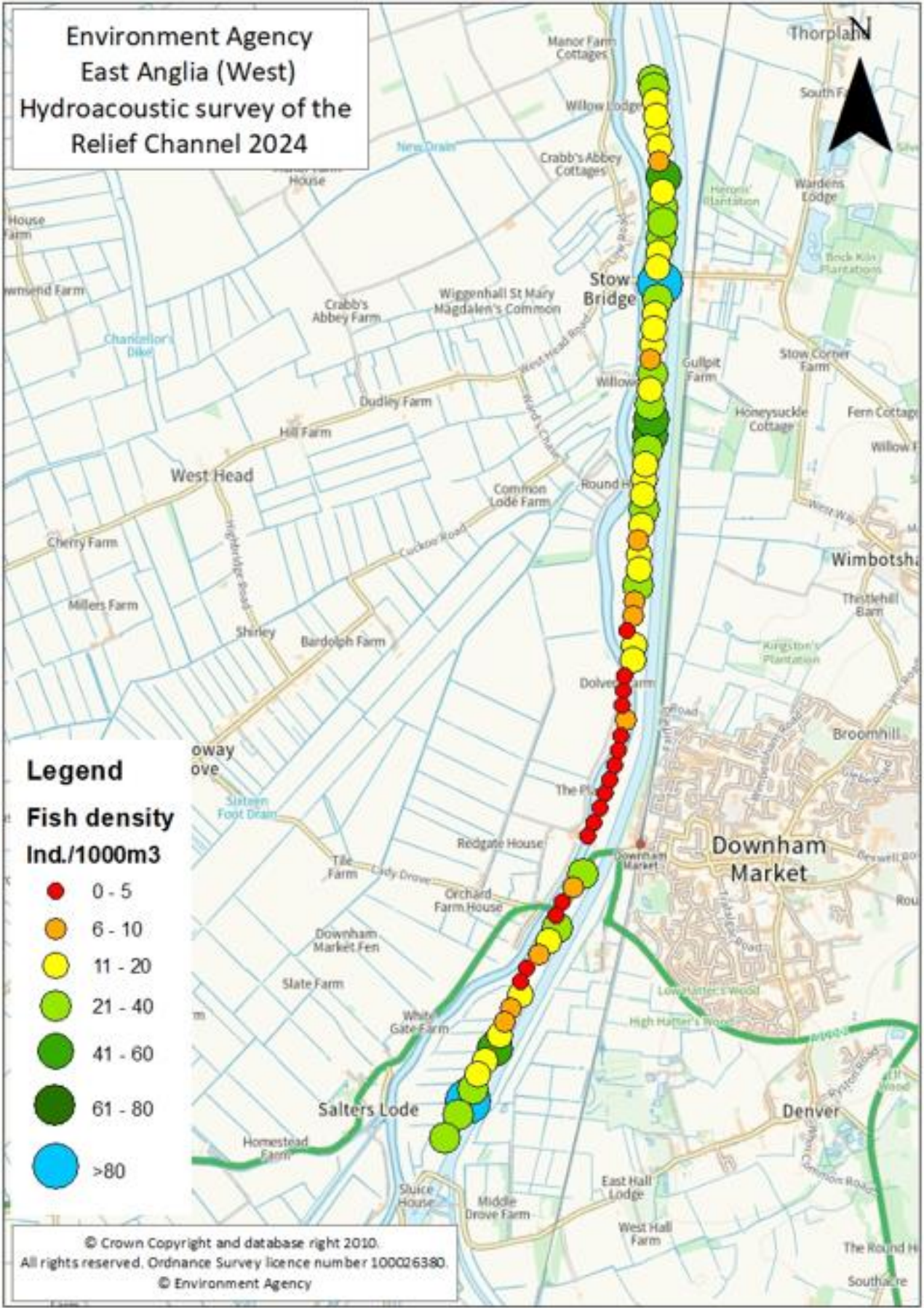
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Hydroacoustic survey of the  
Relief Channel 2024**

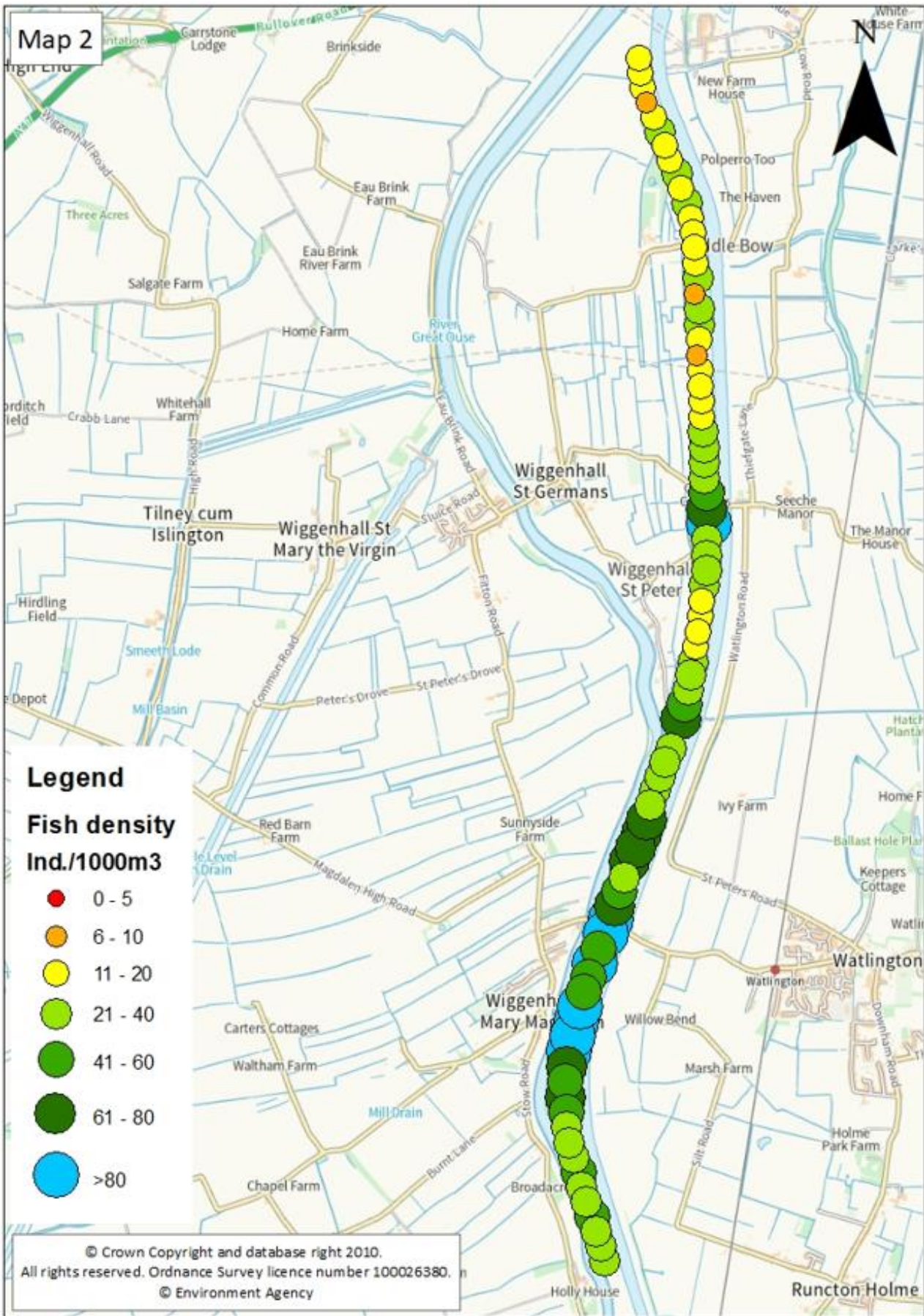


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