

**From:** [REDACTED]  
**Sent:** 01 July 2021 16:55  
**To:** [REDACTED]; [REDACTED]; [REDACTED]; [REDACTED]  
**Subject:** RE: Hoveton Great Broad - Fish Stock Modelling and Assessment Information request

OK, I have had a brief look at the BASG fish stock model but haven't the time at the moment to check out relevant references that may have been included in the synopsis of biological data on bream referred to in the presentation.

The model is described in a presentation which isn't always the best format unless you were actually at the presentation delivered by its author.

Accordingly there are few things that hit me in the face as I read through it – these are probably down to my interpretation and understanding of the presentation rather than there being anything wrong with the approach.

Graph 1 – the upper chart shows a dimensionless representation of the biomass of the bream population and that of “annual spawning”. As seen it suggests that a) the bream biomass remains constant year on year b) the ratio of biomass of the bream population and biomass of new recruits is approximately 1:1 – which seems odd if my understanding of “annual spawning” is correct. Whatever the interpretation is, it is misleading to depict these quantities as remaining constant year on year. However I would be prepared to accept this if this was done purely for illustrative simplicity.

The lower chart shows the annual mortality profile. This is Ok in general shape, though in reality may be more variable through the fishes' lives – specifically I would expect a higher mortality rate in the first year – between 80 and 99% - and a higher rate – between 40% and 60% until the fish reach perhaps 5-8 years old and a size beyond the gape of the commoner predators, namely I would think pike and cormorants. Thereafter, annual mortality will reduce and will mostly be accounted for by post-spawning mortality.

On slide 8 there is a multi-year life table for bream – my question here is where do the starting numbers come from and where does the variability come from? For the latter I would guess that it comes from an assumption about the number and age/size structure of the spawning population of bream present in any one year and then an estimation of the total egg-crop and hence number of “new starters” the year following. Even assuming that the spawning population and its size-structure are the same year on year, in a more sophisticated model you would include a random factor for varying spawning success and fry survival – indeed these are probably the key factors affecting recruitment.

Slide 12 and graph 2: The presentation states that the damage is “unrecoverable”. This is not strictly correct on two points. Firstly, assuming that HGB is returned to the Bure system in 2031, the model shows that although a decline might continue beyond 2031, a slow recovery is likely. Secondly, simply due to the very high fecundity of bream, populations can rapidly rebuild from a very low base when optimum conditions arise. Bream populations in the Bure system reached a very low point between the mid 80's and early 2000's (wish we knew how low) yet staged a spectacular comeback from the mid 2000's onwards such that in recent years, bream particularly the younger “skimmer” bream have dominated the fishery.

However none of these details detract from the fundamental argument that:

- The sustainability of the northern broads bream population, like most other fish populations, depends on successful recruitment at intervals. For a relatively long-lived and fecund species, these intervals can be quite widely spaced as compared to a small, short-lived species such as grayling or bleak; however, ten years of no or very low recruitment clearly presents a big risk not only to population sustainability but also to the viability of a valuable and popular fishery.
- An increasing body of evidence is suggesting that HGB is of fundamental importance for spawning of the bream population of the wider Bure / Northern Broads system. Whilst the argument that bream will spawn elsewhere seems at first sight valid, there is a lack of evidence as to how quickly and successfully this happens especially in systems where fish populations have adapted over hundreds of years and have developed “learned” behaviour patterns. Hence to deprive the bream of such a fundamental part of their habitat, without provision of a proven substitute site, carries a high risk.

This doesn't really constitute a full peer-review, I would need to have the “nuts and bolts” of the model and ideally talk through it with the authors in order to do this and would take more time. Also to possibly discuss with others from the IFM who have considered this.

I won't comment further on other parts of the presentation, that's for another day.

[REDACTED]  
**Principal Fisheries Scientist,  
Chief Scientist's Group (Water Team)**

**Contact me for:** *fisheries science and management advice, fisheries research programme*

**My normal working days are now Tuesday, Wednesday and Thursday**

**Environment Agency, Mance House  
Arthur Drive, Hoo Farm Industrial Estate  
Worcester Road  
Kidderminster DY11 7RA, England, U.K.**

**Direct Lines:** [REDACTED]  
**Mobile:** [REDACTED]  
**email:** [REDACTED]@environment-agency.gov.uk

**From:** [REDACTED]  
**Sent:** 22 June 2021 09:35  
**To:** [REDACTED] <[REDACTED]@environment-agency.gov.uk>; [REDACTED] <[REDACTED]@environment-agency.gov.uk>; [REDACTED] <[REDACTED]@environment-agency.gov.uk>  
**Subject:** FW: Hoveton Great Broad - Fish Stock Modelling and Assessment Information request

Hi [REDACTED]

Apologies for the delay in responding. This is possibly something [REDACTED] [REDACTED] would be able to comment on, but I'm aware he won't have much time to dedicate to this....and I've just spotted he's on leave until 29<sup>th</sup> June.

What timeline are you working to please?

Thanks

[REDACTED]

[REDACTED] - E&B Manager, Fisheries

Contact - Mob: [REDACTED] | Ext: [REDACTED] | Int: [REDACTED]  
[REDACTED]@environment-agency.gov.uk

“Ensuring that the natural environment, water and land, fisheries and ecosystems are protected, enhanced and resilient to change.”

From: [REDACTED], [REDACTED]  
Sent: 16 June 2021 17:28  
To: [REDACTED], [REDACTED] <[REDACTED]@environment-agency.gov.uk>; [REDACTED], [REDACTED] <[REDACTED]@environment-agency.gov.uk>  
Subject: FW: Hoveton Great Broad - Fish Stock Modelling and Assessment Information request

Hi [REDACTED] and [REDACTED]

Please can I ask for some further advice regarding HGB?

Broads Angling Services Group (BASG) provided a fish stock model as part of their FRAP consultation responses – please see attached. I have checked with Legal ([REDACTED] and [REDACTED]) and they have advised that it would be helpful if we could have a technical view on the model, including its validity and relevance so that we can properly consider it within our decision making.

Do you know of anyone who could review the model for us and provide an impartial assessment?

Thanks very much

[REDACTED]

From: [REDACTED]@basgonline.org [REDACTED]@basgonline.org]  
Sent: 02 June 2021 10:04  
To: [REDACTED], [REDACTED] <[REDACTED]@environment-agency.gov.uk>  
Subject: RE: Hoveton Great Broad - Fish Stock Modelling and Assessment Information request

Hi [REDACTED]

I have now discussed this with the BASG Directors and provided answers your points 1 – 5 below. But before this, I must remind you that we are not the formal statutory authority on fishery matters, that function resides with the EA Fisheries, Biodiversity and Geomorphology Team, who have a regulatory duty under the Environment Act 1995 to maintain, improve and develop fisheries.

1) Please can you provide more detail on who this fish stock model and assessment was shared with?

The model was presented and explained in detail separately with NE 8<sup>th</sup> Jan 2020 with [REDACTED] [REDACTED] and [REDACTED] [REDACTED]. See presentation attached

The model was presented and explained in detail separately with Environment Agency 29<sup>th</sup> Jan 2020 with [REDACTED] [REDACTED], [REDACTED] [REDACTED] & [REDACTED] [REDACTED]. See presentation attached

The model complements and supports the view from the agencies own fishery experts as well as the IFM. Who gave advice on its formation.

2) By “Project team” are you referring to Natural England’s - Hoveton Great Broad Restoration Project team?

I have named the people who we have met and discussed the project. We asked several times to be a partner in the emerging advisory group, but have never being formally asked to join, since we engaged with Fish Legal. Advised by [REDACTED] [REDACTED] of this 13<sup>th</sup> Oct 2020. Indeed it appears this advisory group met in Jan 2021, without any fishery representative.

3) Can you clarify what you mean by “which has been accepted”?

The term “accepted” is reference to the model concept, not what it actually demonstrates as a conclusion. That is the core of the issue, between the applicants view and ours and FBG/IFM/AT.

- 4) If you have written evidence that either Natural England and / or the Environment Agency have reviewed this fish stock model and assessment and deemed that the model is fit for purpose, please could you provide this

I have shared the presentation on the models structure and formation with NE, 8<sup>th</sup> Feb 2020 email attached.

In your permit decision document EPR/NB3494JP dated 3<sup>rd</sup> Sep 2020, you make reference to the model within the conclusion section Point 1. This refers to the model being a "valid" approach but is based on non peer reviewed assumption on fish spawning success. These assumptions have since been peer reviewed by both the PhD and by the IFM

NE now seem to reflect that there would be an impact on the fish community of the Broads.

*"There is a difference of opinion as to the likely impact of the isolation of Hoveton Great Broad and Hudson's bay on the wider fish community. The PhD fish tracking study has shown bream travel considerable distances (~25km) within the Northern Broads and shows that Hoveton Great Broad and Hudson's Bay are a favoured habitat especially around spawning time (Winter 2020)."* Natural England also went direct to the IFM prior to the consultation and again the project outcomes were directly challenged, by some of the UJK's leading Fishery Scientists. None of these facts are in the public domain, yet again. Only the applicants views and opinions.

The IFM state: Biomanipulation in HGB by excluding spawning bream could have severe impacts on local stocks in both HGB and the River Bure, affecting fish community structures, aquatic ecology and angling. So we were very unlikely to have a received the view from NE accepting the conclusion of the model. The assumptions are now based on peer reviewed paper(s) following the PhD thesis publication and also formal consultation response pre consultation response(s) from the IFM.

- 5) Please could you provide the fish stock model and assessment to the Environment Agency for our consideration. This fish stock model and assessment needs to be considered as part of the permit application decision-making process. Can you confirm that we have your permission to share this information with the public if required?

We are more than happy for the presentation as attached be shared, however the actual technical model is owned by BASG.

As previously discussed, we would like to be part of the wider stakeholder group in which this model could be a useful tool in the future management of the Broads and its fish stock.

The IFM have detailed some alternative management strategies to be considered, rather than barriers and bio-manipulation.

We therefore request these alternatives and the associated modelling be part of an alternative solution, to ensure the wider Broads ecology is maintained.

Regards

[Redacted]

Chairman BASG CIC  
Chairman Angling Trust Eastern Region Freshwater Forum.

Home [Redacted]  
Mob [Redacted]  
Email [Redacted]  
Topic: [Redacted] Personal ZOOM Meeting Room

From: [Redacted], [Redacted] <[Redacted]@environment-agency.gov.uk>

Sent: 28 May 2021 09:10

To: [Redacted]@basgonline.org

Subject: Hoveton Great Broad - Fish Stock Modelling and Assessment Information request

Hi [Redacted],

I am contacting you following your public consultation response to the Hoveton Great Broad (three fish exclusion barriers) Flood Risk Activity Permit application, as we would like to get some additional clarity on the fish stock model and assessment mentioned within your response.

We note that your response makes the following statement *"We have modelled the impact and shared this with the project team, which has been accepted"* and we would like further detail on this:

1. Please can you provide more detail on who this fish stock model and assessment was shared with?
2. By *"Project team"* are you referring to Natural England's - Hoveton Great Broad Restoration Project team?
3. Can you clarify what you mean by *"which has been accepted"*?
4. If you have written evidence that either Natural England and / or the Environment Agency have reviewed this fish stock model and assessment and deemed that the model is fit for purpose, please could you provide this.

5. Please could you provide the fish stock model and assessment to the Environment Agency for our consideration. This fish stock model and assessment needs to be considered as part of the permit application decision-making process. Can you confirm that we have your permission to share this information with the public if required?

Further clarity on these points will assist us in our decision making on this application.

Best regards



Environment Agency

[Redacted]

**Flood & Coastal Risk Management Officer - Norfolk and Suffolk Partnership and Strategic Overview Team - East Anglia Area**

☎ [Redacted] ☎ [Redacted] (internal) ✉ Environment Agency, Dragonfly House, 2, Gilders Way, Norwich, Norfolk, NR3 1UB

**Our offices are closed and we are unable to receive posted correspondence, please contact me electronically until further notice.**

✉ Email: [Redacted]@environment-agency.gov.uk

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