

BFI Elected Members Forum

Minutes of the meeting held on 08 May 2025

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Present

Jan Davis- Broadland District Council (Chair), Harry Blathwayt- North Norfolk District Council, Tony Grayling- Broads Authority, Kevin Maguire- Norwich City Council, Matthew Shardlow- Broads Authority.

In attendance

Giles Bloomfield- Great Yarmouth Borough Council, David Cobby- Jacobs, Peter Doktor - Environment Agency, Kellie Fisher- Environment Agency, Catherine Harries- Environment Agency, Mairi MacArthur- Environment Agency, Kevin Marsh- Jacobs, Marie-Pierre Tighe- Broads Authority, Kylie Moos - Broads Authority (minutes).

1. Apologies for absence and welcome

The Chair welcomed everyone to the meeting.

Apologies: James Bensly, Richard Elliot, Andrée Gee, Paul Wells, Melanie Vigo Di Gallidoro.

2. Purpose of the day- seeking EMF endorsement of BFI pathways

The process of combining possible flood risk management actions was discussed at the last Elected Member Forum (EMF). Since then, further work has been done to refine the combinations, including taking account of initial modelling results. The actions have now been combined into four 'pathways.' The purpose of today's meeting is to receive feedback from elected members on the recommended pathways and agreement to proceed with their modelling and appraisal. It is important to note that the pathways should not be taken as final., There will be more decisions to come in the next stages of the plan development.

3. The context - the BFI strategy creation process and current position

Peter Doktor (PD) presented an overview of the BFI strategy creation process and its current position. The project team have been through the stages to understand the characteristics of the study area, identifying what is important and the climate change challenges it faces. This stage included the hydrological model, of which, the results are starting to come through and are being used. Feedback on the characteristics of the area came together in the list of BFI objectives before moving on to today's topic and the endorsement of pathways.

Work to date:

- Toolkit of 16 possible generic flood risk management action types was identified in 2023.
- Last year the initial combining of actions resulted in three 'proto pathways'. These were initial thoughts of what pathways could look like.
- Recent modelling of the change in flood risk with climate change and other analysis has given better insight to the likely effectiveness of actions over time.

- There are now four pathways in addition to the two baselines of do-nothing and maintain the standard of service.

The two 'baseline' scenarios are a requirement of the EA process. In the coming months, those baseline scenarios (below) will be compared with other scenarios which are being developed.

No further action (also called do-nothing): This scenario assumes no additional flood risk management and no maintenance of existing defences. It helps us understand the potential consequences and costs of inaction.

Continuation of current measures (also called maintain standards of services): This assumes that current management actions remain unchanged, including maintaining flood walls at their current height and operating pumps at current capacity. This scenario will show how well our current systems can cope with the projected increases in winter river flows and sea level.

A member asked if the different geographical areas might require different actions or action combinations. PD responded, the pathways that are being presented today apply to the study area, but within each pathway there may be actions that appear to be contradicting the overall theme of the pathway. As the strategy progresses there may be different pathways in different parts of the study area which will become apparent. Kellie Fisher (KF) added, pathways move and change over time which gives the BFI agility, adaptation pathways are becoming the norm for how flood risk is managed.

A member asked if there will be a second phase of modelling before the pathways are concluded. David Cobby (DC) responded, modelling has not taken place on the initial pathways, today is about agreeing what is being taken into the modelling exercise whilst being aware that there is a limited budget.

4. The current approach – how will it fare in future?

Catherine Harries (CH) shared study area maps that identify both the fluvial and flood risk based on a 1 in 20 year event if the current assets are maintained and remain at their current height for the year 2040, 2070 and 2125. It is also one of the "baseline" scenarios that will be used for modelling and undertaking economic analysis. The impact of climate change is significant. If we were to continue with the existing flood risk management infrastructure, the maps show that there will be pressures from the mid to latter part of this century and that tidal flood risk is increased. This demonstrates that continuing solely with existing infrastructure and maintenance regime will not achieve some people's aspiration of maintaining the status quo. It is also unlikely that one single action is suitable for both fluvial and tidal flooding, instead a combination of actions is needed.

A member asked if there is map which shows where the flooding would recede to. KF responded, the mapping assumes that the pumps will still be working. Giles Bloomfield (GB) added, if the pumps are removed, then the water would remain trapped behind the embankments.

The fluvial flood risk map is based on a large fluvial event taking place in the Northern Broads and coming down the river with normal tide conditions. DC added that it is unlikely that rainfall of that magnitude would cover the whole BFI area, which is why it has been modelled on the Northern Broads to illustrate fluvial flood risk. It does however impact the Southern Broads due to tide locking and the inability of the water to discharge out of the system.

A member asked if a combination of fluvial and tidal flood should be modelled. The maps presented today are just examples and not the extreme scenario.

GB asked if the risk is being undermined by splitting the Northern and Southern Broads. DC responded, the process does get combined as is being assessed through the economic elements of our options appraisal, but the actual likelihood of such an event is extremely low. KF added, we have to be realistic and replicate the most likely events to ensure our modelling budget is used wisely. The model has also been used to better understand the impacts of extreme events, such as storm Babet, and this information is being included.

Based on the maps, there is the potential for transition away from high risk areas. Several communities would be impacted by unsustainable flood risk under a baseline approach. CH added, the baseline approach is required to mirror the baseline economics and to understand what the consequences are if current assets are maintained. The pathways which are presented today highlight different possible futures.

5. Pathway development

DC introduced pathway development.

Developing the pathways

- Each pathway sets out steps to a different future outcome for flood management across the BFI area. All pathways for the Thames Path 100 converged into a future with a barrier. This is unlikely to be the case for the BFI area and there will be diverse possible outcomes.
- Each pathway comprises of a series of flood risk management actions across the plan area, which act together to achieve a particular outcome; some actions need to be 'exceptions' to the general direction of the pathway.
- The adaptation approach does not focus on eliminating actions but on keeping realistic actions available to deal with future uncertainty.
- We should therefore be able to switch from one pathway to another if future circumstances require it.
- The BFI Plan will not attempt to agree actions for 100 years but suggest a preferred pathway and agree the first/next step along this.

Recap of Decision support context

- At this early stage pathways are a start point for analysis and refinement but will ultimately be assessed using a combination of:
 - Economics: over the whole life of each pathway, recognising rules, government and stakeholder priorities etc. may be very different in the future.
 - Multi-criteria Analysis (MCA): using the agreed BFI objectives and weightings, recognising economics is only one of many objectives which will be traded-off against each other.
- Previous steer to keep affordability (informed by economics) and MCA separate.
- Two possible ways of using together to suggest longer term preference:
 1. Focus on fulfilling objectives as measured through MCA; economic and affordability assessment suggests scale of the funding gap and implementation challenge.
 2. Focus on economically viable pathways; MCA suggests how to maximise achieving objectives within this.

A member commented, at previous meetings it was agreed that the economics would be left out until a later date. They would like to see what is feasible without being restricted by the economics and noted that the treasury rules (i.e. the guidelines and processes governing public spending) are for the day to day decisions and are not suitable for a long-term strategy. DC agreed and added that decisions does not need to be made today. GB added, when using the modelling to frame the assessment area during a tidal event, the economics needs to include the issue of water resources. DC responded, Jacobs are working on a public facing document to explain the economics that can be carried out as part of a flood risk strategies, but there are limitations as to what can be included for the costs and benefits, a pragmatic approach must be taken.

DC explained that saline intrusions are not considered in the economics of the current plan, and it is not something that would be given a value in the same way as flooded infrastructure, for example. A proportionate approach is required in line with treasury rules and grant in aid funding. KF added, this is what makes flood risk strategies so difficult, it is right to not be constrained by the current rules, as these may change over the lifetime of the strategy, but we need to have a proportionate and realistic approach, and not everything can be valued. It is noted that the BFI is a £5 million strategy.

A member asked if there is the technical ability to access the economic cost of a saline intrusion. DC responded, in the model it is possible to uplift the damage that is apportioned to flooded properties, but it will not show the macro changes for areas such as agriculture and water supply. The government would need to advise how to value these areas as part of the economic analysis.

A member asked if the number of landfills that would be at risk have been considered. DC confirmed that it would be possible to find this information based on a previous piece of work.

The Chair concluded that whilst there does not need to be a decision on the possible ways to suggest longer term preference, the qualitative comments regarding saline intrusion, landfills, and transport links need to be included, otherwise we are giving an unrealistic view of the future. A member added, local authorities will also be looking at the economics, local plans and how they manage their areas.

Introducing the pathways

DC introduced the four pathways with supporting graphics from Deltares.

- **Protect (Embankments and Open Channels):** Maximising embankment raising in line with sea level rise and increased drainage of low lying land. Realigning other compartments for online flood storage, including coastal structures.
- **Accommodate (Storage and Managed Realignment):** Maximises flood storage and managed realignment. Naturalisation of low lying land and clustering of development to higher ground seeks natural and social environments which are sustainable for the long term.
- **Protect (Individual Channel Structures):** Introduces sluices into the major rivers to prevent tidal surges propagating upstream, with a tidal barrage in Great Yarmouth eventually replacing the individual structures.
- **Protect (Tidal Barrier/Barrage):** Implements a Great Yarmouth tidal barrier in the medium-term. Coastal structures in the Upper Thurne would be raised along their existing alignment, effectively isolating the BFI area from both coastal and tidal flood risk.

‘Offline’ flood storage refers to water that needs to travel over a structure or embankment. With ‘online’ storage water can go in and out to watercourses, it is usually cheaper, but there is less control.

A member asked if droughts should be considered, particularly with pathways that include water storage which would increase resilience. GB agreed that the ambition should be to store as much water as possible, current licensing and the Water Framework Directive are not enabling this to happen. DC confirmed that water surface storage and managed aquifer recharge would be considered.

6. Review of posters

Members were given an opportunity to review the four pathway posters. Each poster included:

- Description of the pathway in terms of the outcome and main FRM actions anticipated.
- List of FRM actions anticipated in each future epoch to deliver the pathway.
- ‘Graphical’ summary of the pathway to convey key outcomes.
- Indicative programme of FRM actions anticipated to deliver the pathway.

7. Discussions of the pathways

DC asked members the following questions regarding the four pathways:

- What are your comments on the pathways?
- How acceptable would each pathway be to your constituents.
- Would you have the appetite to promote this pathway?
- What opportunities exist to implement this pathway?

A member asked if rising ground water is being taken into consideration when there are already homes in Great Yarmouth which have pumps running all the time under their floorboards. DC responded, large solutions like a barrier will not solve all problems, it might protect most of an area, but there will still be isolated cases that cannot be protected, and ground water will continue to rise. Pumps and large drainage structures are possible, but they will only buy people time as the levels continue to rise.

Protect (Embankments and open Channels)

A member commented that natural areas such as shingle beaches, dynamic dune systems and accreting salt marshes would be lost under this pathway. All the options use a lot of carbon and energy, and natural solutions do not seem to be considered enough, acknowledging this would impact the local population. DC responded, the top line of the pathway actions for all pathways is 'maximise NFM (Natural Flood Management) and SuDS (Sustainable Drainage Systems)' but they are aware that there will be limits to this. The accommodate (storage and managed realignment) pathway includes the most natural solutions of all the pathways.

Regarding the sustainability of pathways, a member commented that there must be a cutoff point for continuing to raise embankments and their capacity.

A member commented that there is an island in Japan that used barriers and everyone was initially happy, however, the island has since lost their beaches and tourist industry. There are already plenty of examples around the world where people have taken the steps that the BFI is considering.

The Thames Coromandel Shoreline Management project (New Zealand) is being presented at an upcoming flood and coast meeting, a member suggested that the project may have relevance to BFI.

CH commented that this pathway would have a big impact on the landscape in the Broads including waterfront properties which are unique to the Broads. A member added, the pathway could also lead to a transition of new tourism opportunities.

Accommodate (Storage and managed realignment)

A member asked if this pathway includes a roll back of populations. DC confirmed, depending on location, that the potential for this is included under 'managed realignment,' the term also

includes the realignment of assets and structures. A member requested that this is made clearer and noted how sensitive the communication around this pathway is.

This pathway would change the makeup of the Broads which is home to some of the most endangered species in the country, a member asked if the impact of biodiversity has been considered and how is this monetised. PD responded, this is one of the future tasks that will need to be completed. Part of the appraisal is around natural capital which includes possible monetisation, and where relevant appraisals will need to be carried out based on current legislation. It is possible that compensatory measures would be required. Through the Environment Agency's habitat creation programme there is experience of this and landowners do approach the Agency wanting to change their site. The Environment Agency have previously worked closely with partners like the RSPB to achieve this.

A member commented on the pace of change and recommended a gradual transition and adaption that will give the endangered species a greater chance to survive. GB added they have had experience of trying to replicate drains for key Broads species when the drains are side by side, but the chemical conditions are not the same. A 50 year lead time to translocate species may not be long enough and some species cannot just be moved to the north where the water is a lot softer and does not contain the same level of minerals. The carbon footprint also needs to be considered when looking at the consequence of allowing more water on the land.

Protect (Individual Channel Structures)

Regarding the dates for each epoch, DC confirmed that the dates are not set in stone, and they will be flexible with climate change. The first epoch is relatively small at 10 years; this is a transition period from what is taking place now to a new pathway.

A member asked what the barriers and sluices would look like, for example would a sluice at the end of the Bure be the same scale and structure as a flood barrier in Great Yarmouth. Kevin Marsh (KM) confirmed that the sluice would be likely a small structure with a lock; whereas, structures on the Yare and Waveney would be much bigger. Strategies dating back to 1995 identified a Bure barrier as a favourable option as it can balance the saline water in the upper system and tie in with a storage area in Breydon to balance the flows.

A tidal barrier would eventually change to a barrage because the barrier would need to frequently remain closed due to rising sea level rises. KM added once a structure becomes a barrage then large pumps would be required to pump out the fluvial flow. A member questioned who would pay for the pumps and their maintenance costs and questioned if it is a good use of money if there is not the funding to maintain the structure. KF added, a structure would be subject to bidding for funding allocation, which is the same of all Environment Agency assets, and if it is expensive to run, the benefits of doing so must be proportionate to justify continued investment.

A member asked if sluices are a way of buying time before transitioning to a barrier. DC agreed that this could be an option, pathways are adaptable and can move between each other.

Protect (Tidal Barrer/Barrage)

DC confirmed that through this pathway a pump out from Somerton through the sea wall would be more towards the end of the century. The Hundred stream drain refers to a time when the Bure used to exit out to sea in the Somerton/Horsey area. A member supported bringing forward this item and questioned if there would be ecological issues. CH responded, there would be a saline draw and the outfall pumps would be investigated. GB added there is already a lot of brackish water with high levels of ochre in the area and saline pressures will increase over time.

Additional water in the Waveney currently discharges over Mutford Lock and out to sea via Oulton.

A member asked if this pathway opens the possibility of a barrier at Lowestoft again. KF responded, the barrier was supposed to be a certain width but after the modelling took place for navigation it was agreed that the barrier would need to be wider, and the funding gap reached >£124million at the time the scheme was halted. Therefore, without significant further investment, it is unlikely that the barrier will take place.

There are six storm surge barriers in East Anglia, which are complex to maintain, require their own on call team and are expensive to maintain. CH added, with sea level rise the structures would be operational increasingly often which then prevents the opportunity to undertake vital maintenance activities. Secondary structures may also be necessary to manage water levels during maintenance work which further adds to the costs.

Transitioning between pathways

DC shared a diagram of different options for transitioning between pathways.

- Protect (Open) to Accommodate possible prior to significant raising/pump capacity increases. Otherwise, to Protect (Barrage).
- Once selected, Accommodate is likely to be a commitment for the long-term
- Protect (Channel) most naturally leads to Protect (Barrage) but could also prepare for long-term Accommodate.
- Protect (Barrier) is likely to be a commitment for the long-term, with barrier transitioning to a barrage.

Preferences for the pathways

DC asked members; if we were to rank the pathways to follow, which would be your first and last preference, and why? Today is not about excluding any pathways.

A member commented that it is difficult to identify their preference when the pathways are based on ideology rather than evidence. KM responded, the preference is to help the team understand where to concentrate the modelling to make best use of the funding available.

A member favoured the protect (individual channel structures) pathway on the Bure with a transition to the accommodate pathway. KM added, they would still need to model storage on the Bure, but they have some ideas of how to do this as well as freshwater storage.

GB commented that the accommodate pathway will eventually be the same as the 'baseline' flood risk model with most of the Broadland area being below sea level. Tidal locking will also create a continuous event with the storage remaining full. KM responded, the online and offline storage needs to be modelled for both scenarios and how it impacts water levels in the river. GB added, that protect in the accommodate scenarios would still require some kind of flood risk asset.

The Chair suggested that some consideration is given as to how the BFI communicate these issues at the next EMF and would like to see a supporting comms plan and education packages. CH agreed that the narrative is important, and we would need to develop social interventions. KM added, generational change over 15-20 years is required for people to become familiar with the accommodate pathway.

DC reminded members that 'good' could look very different in each of the four pathways. The project team today are seeking EMF endorsement that each of the four pathways are appropriate to model.

A member commented that protect (individual channel structures) and protect (tidal barrier and barrage) pathways are similar, just with different timings. Looking at the timings within each pathway and what can be done is important. A member commented that there could be a political call to look at a tidal barrier. Another member proposed that the cost of a tidal barrier is divided by the amount of houses that it will be protecting to see if the cost could compensate houses to move.

A member commented that they prefer the accommodate pathway that transitions to a protect (barrier) pathway. They noted that a barrier is very expensive, and the accommodate pathway slows up the process to allow for more education in schools.

Whilst there may be preferred options, secondary options will be needed, and the costs may affect the conclusions. Rationale will need to be applied for what may or may not be funded. Geographically it may not be possible to deliver the actions everywhere.

Managed realignment under the accommodate pathway includes an exercise to look at the cost of relocation. The Pathfinder project was successful in North Norfolk and led to [Coastwise](#), the Coastal Transition Accelerator Programme (CTAP). KF added, there may be more innovations in the future that help deliver BFI.

A member commented that they would like to see both flood and coastal erosion covered by insurance. Flood Re have said that, in theory, relocation could be funded if a property becomes uninsurable for flood risk (a 'write-off'), but they are exiting the insurance market in 2039, and no precedent has been set at this time.

A member commented that when people move into a new area there will be more information on possible flood risks than there has been in the past and they are more likely to adapt. There are also instances where people do not want to move and instead have built their own flood risk assets around their property. KF added, everyone's interpretation of risk and adaptation is different.

7. Conclusions

Members endorsed the four pathways and agreed to proceed with their modelling and appraisal.

8. Any other business

No matters of any other business were raised.

9. Date of next meeting

10.00am-12.00pm 10 July 2025