

# BFI Elected Members Forum

Minutes of the meeting held on 14 October 2024

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## Present

Jan Davis- Broadland District Council (Chair), Harry Blathwayt- North Norfolk District Council, Richard Elliot -South Norfolk Council, Noel Galer- Great Yarmouth Borough Council, Andrée Gee – East Suffolk Council, Tony Grayling- Broads Authority, Robert Savage- South Norfolk Council, Matthew Shardlow- Broads Authority, Melanie Vigo Di Gallidoro – Suffolk County Council.

## In attendance

Libby Bush- Jacobs, David Cobby- Jacobs, Peter Doktor - Environment Agency, Kellie Fisher- Environment Agency, Catherine Harries- Environment Agency, Martin Horlock- Norfolk County Council, Kevin Marsh- Jacobs, Yvonne Smith- Coastal Partnership East, Marie-Pierre Tighe- Broads Authority, Kylie Moos - Broads Authority (minutes).

## 1. Appointment of Chair

Jan Davis was proposed by Harry Blathwayt and seconded by Mathew Shardlow.

**Jan Davis was appointed Chair of the Elected Members Forum.**

## 2. Appointment of Vice Chair

Matthew Shardlow was proposed by Harry Blathwayt and seconded by Melanie Vigo Di Gallidoro.

**Matthew Shardlow was appointed Vice Chair of the Elected Members Forum.**

## 3. Apologies for absence and welcome

The Chair welcomed everyone to the meeting.

Apologies: Paul Wells (Great Yarmouth Borough Council) and James Bensly (Norfolk County Council).

## 4. Recent work on flood defences ahead of winter

Catherine Harries (CH) shared an update on the works that the Environment Agency have undertaken since last winter and noted, whilst these are not part of the scope of BFI, they are an important back drop to the strategy. The following has taken place since the flooding last winter:

- Improved communications
- Repaired flood risk management assets
- Improved preparation for incidents

### Repairs to flood risk management assets

- Emergency sandbags were replaced with permanently fixed wooden boards at Martham.
- Repaired damage caused by deer trampling over the embankments at Somerton.

- Aided the Internal Drainage Board (IDB) to deliver works at Brograve.
- Commissioned the IDB to undertake crest level repairs at Hickling at Potter Heigham. This has saved £800,000 and meant that the works could be delivered in this financial year. The repairs will decrease the frequency of overtopping.

### Improved the preparedness for incidents

- New trigger levels introduced following works at Herbert Woods.
- Introduced a second trigger based on combined fluvial and tidal levels. The second trigger provides a combined likelihood and takes into account high rainfall and high tides.
- The new arrangements have been exercised in partnership with local councils and was named 'Exercise Hammerhead'.

A member asked if there have been any issues working with local councils whilst carrying out the works. CH confirmed that there have not been any issues and having David Kemp as a named point of contact has helped whilst the works took place.

A member asked if the Environment Agency is aware that there has been tarmacking across the staithe at Herbert Woods in the last few weeks. CH agreed to check with the asset team to see if a permit has been applied for.

CH concluded, the Environment Agency have worked with partners and the community to address some of the learning points from last winter. Where relevant, information has been transferred into the BFI.

## 5. How we develop action combinations for appraisal

David Cobby (DC) introduced the next three agenda items which consider how to move from a toolbox of individual Flood Risk Management (FRM) actions to a combination of actions that are modelled and appraised. Elected members will be asked for their input on a proposal at the end of each item.

### Reminder of baselines

- The presentation relates to 'Do Something' future actions.
- A separate set of baselines are being developed, modelled, and appraised to compare future changes to:
  - Do-nothing to manage flood/erosion risks – this assumes you no longer provide Flood and Coastal Erosion Risk Management (FCERM) interventions and is a baseline against which other options are considered.
  - Do-minimum to manage flood/erosion risks – the least that would be done for FCERM, which must be realistic and reflects typical action during flood or erosion incidents.

- Sustain current standard of service – allows the continuation of the current levels of service provided by FCERM.

### **What do we want to achieve by combining flood risk management actions?**

To move from a generic toolkit of individual actions to specific combinations of the actions which can be modelled, refined, and appraised. Combinations are the starting point for modelling and refinement and not the final answer.

Considerations:

1. Large geographical scale of BFI area => requirement for multiple flood risk management actions.
2. 100-year temporal scale of BFI plan => anticipate changes through time.
3. Adaptive basis for plan => keep future options open.
4. Achieve multiple objectives => only a mix of actions will achieve this.

### **Progress in applying method**

- What we want the BFI Plan to achieve-complete
- Individual flood risk management actions we can use:
  - Types agreed through public consultation - complete
  - Scale, location & timing- underway but not complete
- Alternative futures we should plan pathways for:
  - Workshopped longlist of possible futures based on EA National Strategy- complete.
  - Chose three distinctive futures to begin investigations - complete
- For each future, specify individual actions across BFI area and sequence in time.
  - To fulfil BFI objectives – underway but not complete
  - To achieve a relative level of flood risk management- underway but not complete.

These are starting points; final combinations will inevitably be a mix to suit local characteristics.

### **Next steps and decision required**

1. Develop plausible maximum scales, location, and timing of actions for each combination.
  - Begin with long-term protect followed by medium-term protection and long-term placemaking.

- Modelling action combinations will refine and confirm the flood risk management benefit provided.
  - Understand the maximum flood risk management benefit achievable. Scale can typically be reduced if required.
2. Agree how above fits into wider plans for engagement (see agenda item 6)
  3. Agree how coastal realignment should be incorporated into BFI (see agenda item 7)

DC shared a time sequence of water storage options for the next 100 years which demonstrated that some areas which are suitable for water storage in the near future would no longer be beneficial for water storage if they flood with sea level rise.

Question: Do you agree with the process to combine individual FRM actions to achieve the possible future outcomes?

A member asked if the rate in which the Arctic is melting is being taken into consideration. DC responded, the models will take this into account to some degree (using UKCP18 data), but it is noted that there are several processes that are not represented and the tipping points are not always included. Another member asked if there is a list of assumptions regarding sea level rise and tipping points. DC responded, within the project, a number of different climate change options are explored, some are based on Environment Agency guidance and other scenarios look beyond this, but there needs to be a balance of what is sensible to model, which has to be suitable for funding. Kellie Fisher (KF) added, any Environment Agency model is accompanied by a model report and will be made available once the model is finalised.

As part of the adaptive process, assumptions are not fixed and can be changed in line with predictions and new challenges. The BFI is in the setting and developing stage, and the models may need to be run in 10 years' time. Peter Doktor (PD) added, Jacobs are working on the different climate change scenarios assumptions and socio-economic scenarios which will be brought to Elected Members Forum for agreement.

A member asked if the model considers planning requirements. DC responded, fortunately the scale of development is not too large in the Broads area, but it is possible to test the impact of developments.

A member asked if economics has been included. DC responded, at this stage it is not cost constrained, it is a technical perspective of what could be achieved. Once the appraisal process starts the model will use standard economics in line with the national approach refined to the area.

Three different examples of how the combination of actions could look were presented today as three "pathways", for illustration, but the final output will likely look quite different. And it does not mean that we will have to choose exclusively one of the three pathways. Modelling is quite expensive, and the BFI will apply expertise and logic to define sensible options to model. There has already been over 1000 model runs. If every single action and possibility was considered there would be over 10,000 models runs which could not be delivered by 2027.

A member asked how adaptable the model will be if it is expensive. DC responded, it depends on the change, for example changing a global parameter is relatively easy whereas changing the height of every embankment is more difficult and requires input for each element which is time consuming.

A member asked if BFI is looking at the socio-economic impact flooding. DC responded the socio-economic and environmental impacts of flooding will be presented at a future meeting. Today's presentation and questions are focused on the modelling of water levels rather than their impacts, which will be assessed in a later phase.

A member asked how much of today's discussions will be relayed into the future of house building. Another member responded that the built environment is already included in the list of BFI objectives, to make residential and commercial buildings more resilient. DC added, the Environment Agency plan to publish new flood risk information and flood maps for planning soon (spring 2025) which will account for climate change.

**It was resolved unanimously to agree with the process to combine individual FRM actions to achieve the possible future outcomes.**

## 6. The timing of communication and engagement

### Conceptual design of actions

- Actions must be conceptually designed to the extent that they can be represented in the model and appraised according to multiple criteria based on BFI objectives.
- They will be in specific locations, have a particular scale, and implemented at a particular time in the future.
- Desire that decision makers are comfortable that the BFI is engaging at the best time, and with an appropriate level of information.

### Two possible approaches to engagement (both with pros and cons)

1. Undertake modelling/appraisal to refine action combinations internally, following which we engage on firmer proposals.
2. Engage key stakeholders prior to confirming initial combinations, following which we model and appraise refined concepts

PD shared an example of how an early consultation with landowners of potential washlands would look. This first step would be to see if the landowners would be comfortable with their land being modelled.

Question: Do you agree that the project engages with stakeholders/landowners before refinement of action location/details, which will be done through modelling and appraisal?

A member asked if a washland distinguishes between fresh and saline water. PD responded, both saline and fresh water will be looked at.

A member commented that they are in support of going out early for engagement and suggested using the Upper Thurne Working Group as well. Another member agreed with early engagement and commented that there will likely be suggestions to do something different such as to dredge the river in particular location and would like to know how the BFI is going to respond. The early consultation will be a good indication of how the actions are going to be received once they have been through the modelling and appraisal process. PD responded, during the toolkit of actions consultation process which took place last year there were several suggestions such as an outfall from the Thurne going straight out to sea. All the suggestions have been through the development process and BFI is always open to new ideas. The further down the BFI process, there will be more experience, lessons learnt from previous modelling, and answers available.

A member asked who would carry out the engagement and if the resources are available. PD responded it is likely that the actions will come through the BFI Initiative Project Team particularly from those that have previously worked on the Broadland Flood Alleviation Project. KF added, the BFI Initiative Project Team has a wide range of partner organisations that are also suited for engagement such as the Internal Drainage Board, Broads Authority, RSPB and Wildlife Trusts.

A member noted that the impact on wildlife needs to be considered. For example, the RSPB may have the most suitable land for a washland, but it could also be a SSSI which cannot be used for water storage.

Flood risk management does not offer compensation, but there are financial incentives available for landowners through Environmental Land Management (ELMS) payments. PD added funding is a separate topic and will be discussed later on in the project.

Members agreed for early engagement. It is a sensitive topic, confidence and trust needs to be built up and the BFI Initiative Project Team needs to prepare for future potentially difficult conversations.

**It was resolved unanimously to agree that the project engages with stakeholders/landowners before refinement of action location/details, which will be done through modelling and appraisal.**

## 7. How much detail to consider at the coast

The Upper Thurne Working Group was held on 25 April to discuss the impacts of long-term Shoreline Management Plan (SMP) policies. Outcomes from Upper Thurne Working Group:

- Resulted in possible futures to consider:
  - Raised coastal wall along current alignment
  - Variations on set back structures

- Type (e.g. wall or embankment), scale (decreasing height with distance from shore) and location (around key features) could be conceptualised to facilitate modelling and appraisal.

### **Decision required on BFI relationship with the SMP**

Combining SMP, Great Yarmouth and inland strategies is a primary purpose of BFI. The BFI will not change SMP policy of hold the line or conditional hold the line beyond 2055 but is providing supporting information.

The coastal environment suggests additional sensitivities when engaging stakeholders on action concepts.

Two possible options:

1. Alignments are incorporated into the action combinations, modelled and appraised as all other BFI actions.
2. Treat possible alignments as ‘boundary conditions’ to the BFI; do not conceptualise, cost, appraise etc but simply modify in/outflows as required.

### **Do you agree that BFI includes the impacts of long-term changes in the alignment of coastal structures, cited within the SMP?**

A member commented that they had also attended the Upper Thurne Working Group meeting and noted that people are becoming more open to managed realignment however it is still politically unacceptable in some locations. The member added that they would prefer to see a dynamic dune system. CH confirmed that the BFI are not drawing lines on a map and there are still discussions to be had around protecting settlements.

KF commented, a minimum beach level is required for a concrete sea wall to be effective however sea level rise means that it will not be possible to keep recharging the beach and eventually the concrete sea wall will not be fit for purpose. It may be possible to hold the line over the next 100 years, but it is not certain. Trigger points are used instead of time points, an example of a trigger point is when the level of a beach goes below a particular threshold.

A member commented that the public perception of what is happening at Hemsby is an indication of how people are going to react in the future.

A member commented that the Upper Thurne Working Group have a lot of knowledge in this topic and are made up by a range of different experts, but it is likely that the public will not have the same level of understanding. CH responded, there will be additional engagement needed for the public.

A member asked, with sea levels rising and the increase of erosion on the cliffs, if there is a sediment model available. CH responded, the model is not available through BFI. However BFI IPT stakeholders, Coastal Partnership East are working on a coastal model process through the Resilient Coasts project. KF added, there are several relevant projects taking place including



Coastwise and the work that is taking place at the Happisburgh and Winterton frontage, but they are not being carried out by BFI.

The BFI can make recommendations to the SMP, but it cannot make changes to the SMP policy.

**It was resolved unanimously to agree that BFI includes the impacts of long-term changes in the alignment of coastal structures, cited within the SMP.**

## 8. Briefing on the Bure dredging modelling results

At a public meeting, it was agreed to model the Lower Bure and explore the possible flood risk impacts of dredging the lower reach of the tidal river Bure. Dredging is included as one of the 16 BFI management actions however, but this modelling work sits outside the scope of the BFI. The BFI model was used to assess the effect of additional dredging in the Bure loop.

### The task

- Using the new Broads tidal and fluvial hydraulic model test the impact on river water levels of major dredging on the Bure Loop.
- The model is still in the process of being formally reviewed prior to acceptance but has been successfully calibrated against historic events.

### The dredging scenarios

- Scenario 1: The existing situation with the current channel cross sections as used in the model. This comprises the baseline against which scenarios 2 and 3 are compared.
- Scenario 2: The channel bed level is reduced to at most -2.5m Above Ordnance Datum (AOD) and the channel sides of 2:1 gradient.
- Scenario 3: As above but to at most -3.0m AOD bed level.

This assumes some dredging at all the locations identified previously by stakeholders.

### The event scenarios

- Fluvial (present day) – 50%, 20%, 5%, 1% Annual Exceedance Probability (AEPs) (downstream boundary mean high water springs (MHWS)).
- Tidal (present day) – MHWS, 5%, 1% AEPs (baseflow fluvial boundary).
- Fluvial (in 2040 with flows 14% higher) - 50%, 1% AEP.
- Tidal (in 2040 with sea level 30cm higher) -1% AEP.
- Storm Babet (Oct 2023) actual tide levels and assuming a 2% AEP fluvial event.

### Model outputs

- Outputs are a series of hydrographs showing river water levels for the three dredging scenarios over a 15-day period for each of the event scenarios.

- Hydrographs are produced for the following locations: Haven Bridge, Breydon Bridge, Three Mile, Acle, Potter Heigham, Horning, Barton Broad and Wayford Bridge.
- Tables of differences in water levels for the 'peak' and 'end of simulation' are given but the hydrographs provide a fuller picture.

### Key Conclusions

- For fluvial events dredging has a negligible effect on peak event water levels.
- For upstream locations, high and low tide levels 15 days after the peak event are reduced by dredging, but for Potter Heigham by at most 6cm.
- For tidal events dredging results in higher peak water levels. This is most pronounced for downstream locations such as Three Mile where the difference is 12cm.
- For downstream locations dredging reduces the level of the low tide in all events including MHWS. This reduction is to a much greater amount than upstream, for example at Three Mile by up to 40cm.

### Storm Babet, Climate Change and Cost

- The modelling of Potter Heigham for Storm Babet shows little difference in high tide levels during the peak of the event and subsequently. So no benefit of additional dredging along the Bure loop.
- There is a reduction in low tide levels 15 days after the event by at most 4cm.
- The flood depth is also largely unaffected throughout the system. There is a reduction in maximum flooding depth of 1-10cm in some areas.
- The broad effects of dredging today are similar in the future with climate change.
- The costs to undertake the dredging are estimated at £2.7 million and £4.6 million for scenarios 2 and 3 respectively.

A member asked why there was no mention of Suffolk waterways in the presentation when the marshes were also flooded at Beccles and Bungay last year. PD responded, the Bure Loop was identified as a potential source of the problems which is why the modelling has not been carried out in the Waveney.

A member advised that there is a public meeting is taking place in Hickling on 1 November and it is likely that the Environment Agency are going to be asked about the high-water levels since Storm Babet. The member added that hard engineering at Cart Gap could be a reason for the lasting high water and questioned how long it will be before the sea levels are higher than the rivers. PD responded, the rivers will keep flowing to the seas long as it is lower than rivers. The height of high and low tides will impact tide locking. KF added, sea level rise predictions are based on the evidence that there has been an increase of 5-7cm since the 1990s (12-16cm since 1900). We can therefore expect more tidal locking.

A member asked if the number of properties that would have an increased flood risk on the Lower Bure would relieve those in the Upper Bure and Thurne. PD responded, in theory the scenario could be modelled, but increasing the flood risk to a group of individuals even if there is a benefit elsewhere is not an option.

KF commented, the technical and economic issues around dredging the Bure Loop are already known, the estimated cost to undertake the dredging of the Bure Loop is double the EA budget for the entire Broads. CH added, the lower tides would also draw water out from sensitive habitats.

A member commented that species could be lost quickly due to saline incursions and asked how long it would take new species to adapt to saline water. PD responded, both freshwater flooding in a saltwater habitat and saltwater flooding a freshwater habitat are harmful and will take a long time to recover. The saline impacts of the 1938 breach at Horsey mere is still visible today. Jacobs are looking at a statistical salinity model and the impact of salinity of different receptors. A member added that the Dainty Damselfly used to be in Essex up until the 1953 floods and it has taken over 50 years for the Damselfly to return.

A member commented that although the modelling was not initiated by the BFI, it is a good illustration of how the model can be used, and asked if it can be used as part of the communications strategy as a demonstration of the BFI outputs. PD responded, the report has been uploaded to the BFI webpage and an update on the Bure loop report was included in the BFI newsletter which goes out to over 300 people. A press release was published on 8 October.

KF reminded everyone that the BFI is a 100-year strategy, it is correct that the results of the modelling inform the BFI, but to acknowledge that the Bure loop modelling scenarios were tested for events until 2040.

## 9. Programme to completion

PD presented the timeline of the BFI programme from today to its completion in 2027. Several of the tasks are innovative for the Broads and as such, the timeline can be a bit unpredictable. A member commented that they recognise the iterative process and the scale of the programme, from talking to landowners today to the adoption on the plan in 2027, and that decisions such as the early engagement decided today could impact on the completion date.

## 10. Any other business

Norfolk County Council have requested that future EMF meetings are not held on Mondays due to a clash of meetings. Members were asked if there are any other days that should be avoided when setting the dates for 2025. Mondays were identified as the only day to avoid in the future.

To promote the BFI, MPT asked if members would find it useful to receive a draft report outlining the work of the BFI which could be shared with Local Authorities. All members welcomed the suggestion and agreed to share the report to raise awareness of BFI within their own organisations.

The Norfolk Strategic Flooding Alliance (NSFA) are meeting with MPs on the 31 January 2025.  
The theme of the meeting is flooding and droughts.

## 11. Date of next meeting

To be confirmed.