

## Slowing the Flow at Pickering Project

Programme Board Meeting 2nd September 2010

Paper 10/02

### Bunded Storage Update

#### 1. Purpose

To inform the board members of the current status in relation to the bunded storage element of the Slowing the Flow Project.

#### 2. Background to the Bunded Storage measure

The Ryedale Flood Research Group (RFRG) proposed the idea of using low-level earth storage bunds to help secure better protection from flooding in Pickering. They recommended a detailed model be created of the area to further investigate the possibility of upstream storage.

As part of the Slowing the Flow Project the Environment Agency has led on the bunded storage option and a more detailed model was created to further evaluate this idea. The model has shown that the creation of the bunds alone will not work because the river cannot currently get onto its floodplain due to the channel being too deep. A restriction in the channel is therefore required.

#### 3. How much water do we need to store?

The measurement of a high flow in December 2009 led to a change in the understanding of the water level and flow when flooding starts to occur in Pickering. This is much lower than was previously thought, occurring at a flow of 12 cumecs (equivalent to the 1.2 m reading on the stage board at Ropery Bridge), compared to the previous estimate of 21 cumecs. This means that to provide protection for all properties in Pickering that flooded in 2007 would require 640,000 m<sup>3</sup> of flood storage. Unfortunately this amount of storage is not achievable with the original set of proposed bunds.

#### 4. Practical Considerations

At a meeting in September 2009 with the NYMR, concern was raised over the threat posed to the stability of the railway embankment should the design of the bunds cause flooding of the railway. Based on the discussions with the NYMR it was agreed at this meeting that delivering the bund solution would require additional infrastructure to protect the railway as well as engineered control structures to force the water onto the floodplain.

A number of the original bund locations proposed by the RFRG were discounted due to the closeness of the river to the railway line thus not leaving sufficient space to install the required flood protection to the NYMR.

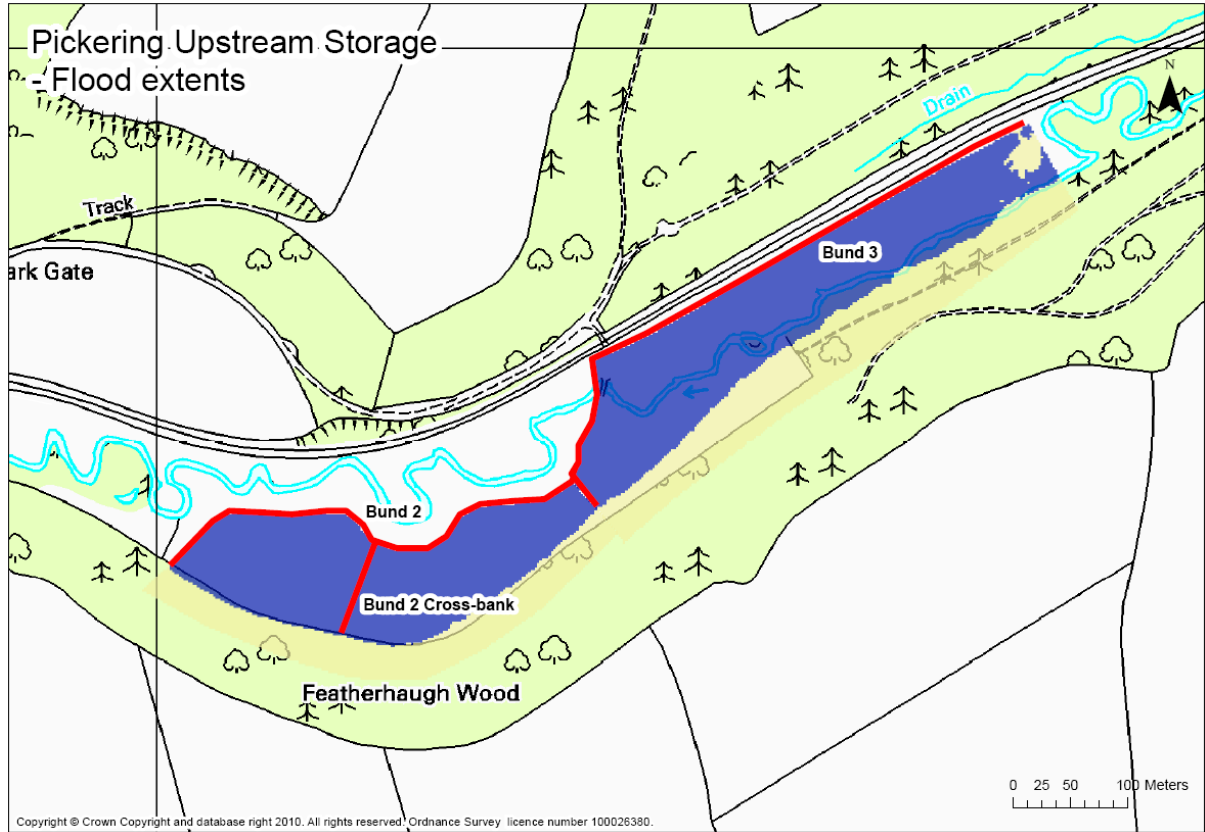
#### 5. Initial Results

Results from the modelling showed that that two options were available for the provision of flood storage:

- Option 1 - the construction of three 1.5 m high bunds across the floodplain and along the railway above Newbridge (L-shaped bunds) - indicative cost of £1.2 m; or
- Option 2 - the construction of two bunds with the inclusion of a cross bund (as shown on the plan below) of 1.5 m in height (Bund

3) and 2.2 m in height (Bund 2 and cross bund) - indicative cost of £950,000.

Whilst neither option would provide protection against more extreme flood events, it could make a difference for smaller, more regular floods. The modelling has shown that the bunds would have held water back 5 times over the last 10 years.



The storage can be used at different times during a flood and therefore different levels of protection can be provided to Pickering. Calculations suggest that the bunds could be designed to stop most of the properties from flooding (approximately 50) that are currently affected by a one-in-25 year flood (similar to the 2000 flood event). **The properties in the Beck Isle area (approximately 6) would still flood because the bunds would be designed not to start filling until a higher flow was reached.**

Alternatively, the bunds could be designed to flood at a lower level of flow, which would protect the Beck Isle area, but only a much smaller number of additional properties would benefit.

It is hoped that the other land management measures can complement the working of the bunds and so achieve a higher level of protection for Pickering as a whole.

## 6. Current Status

The Environment Agency presented the different proposals, outlined above, to the members of Ryedale District Council Planning and Policy Committee. This committee provided a recommendation to the full council that the council provide £800,000 to construct Option 2 - the two flood storage reservoirs with a cross bund, with a channel restriction to provide flood protection for the wider number of properties during smaller, more frequent flood events. This option would leave the properties on Beck Isle to be flooded.

Extensive planning discussions have been underway since October 2009, and at this time we understood that the planning authority would be North York Moors National Park. A formal scoping opinion was submitted in April 2010, when it became clear that the application would need to be considered by North Yorkshire County Council.

Ryedale District Council are due to vote on the provision of a capital grants scheme for flood resilience measures for the unprotected properties on Beck Isle.

We are currently working on the detailed designs for the flood storage bunds, liaising with North Yorkshire County Council and North York Moors National Park regarding the planning application. We are also working closely with the landowner in relation to the proposed works. The site investigation and ecological surveys have been completed to assist with informing the design.

#### **7. Actions**

Members are asked to note the content of this report and to endorse and support the decision taken by Ryedale District Council.

A formal screening opinion letter has been issued to North Yorkshire County Council and the North York Moors National Park requesting a decision on the determining authority. Formal agreement by the members of the determining planning authority - either North Yorkshire County Council or North York Moors National Park is required to ensure the smooth completion of the planning application.

**Lucy Huckson**  
**Environment Agency**