Option 3 – Upstream Flood Storage

Option Overview

This option involves the construction of flood storage dams upstream of Comrie on the Water of Ruchill and the River Earn. Sufficient water would have to be stored upstream during a 1 in 200 year flood, to ensure that there would be no flooding downstream in Comrie. The upstream topography around the watercourses was a factor in determining the required size and potential locations of these storage areas.

Option Assessment

From analysis undertaken in the hydraulic model it became quickly apparent that providing flood storage on the upper reaches of only one of the three rivers would not sufficiently reduce the risk of flooding. Therefore the option of providing upstream flood storage on just one river was discounted.

Our investigations then looked at the potential benefits of combining storage options together. Storage on both the River Earn and Water of Ruchill provided the 1 in 200 year standard of protection to Comrie without the need for any new flood defences to be built in the village. The required dimensions of the earth dams on the River Earn and Water of Ruchill needed to protect the village are indicated in figures 12 and 13 below.

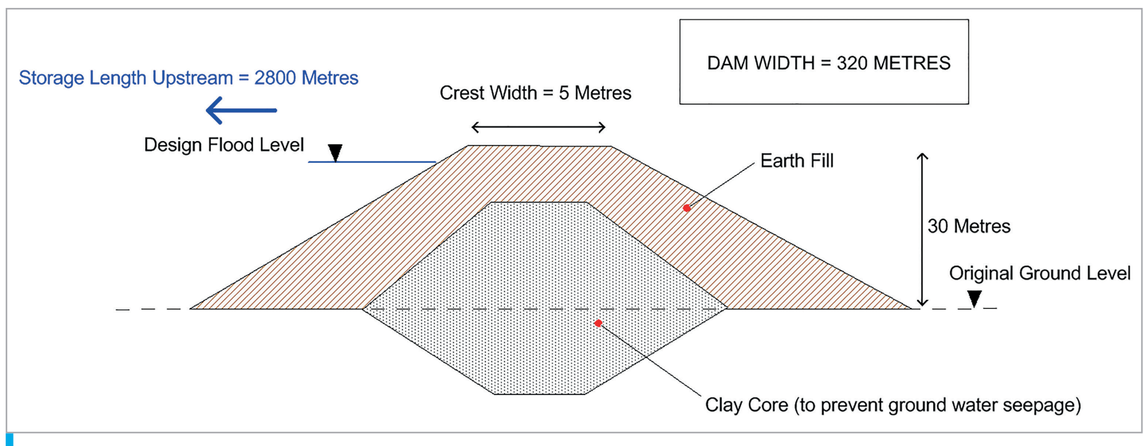

Figure 12: Cross section shows required dimensions of an earth dam on the Water of Ruchill.

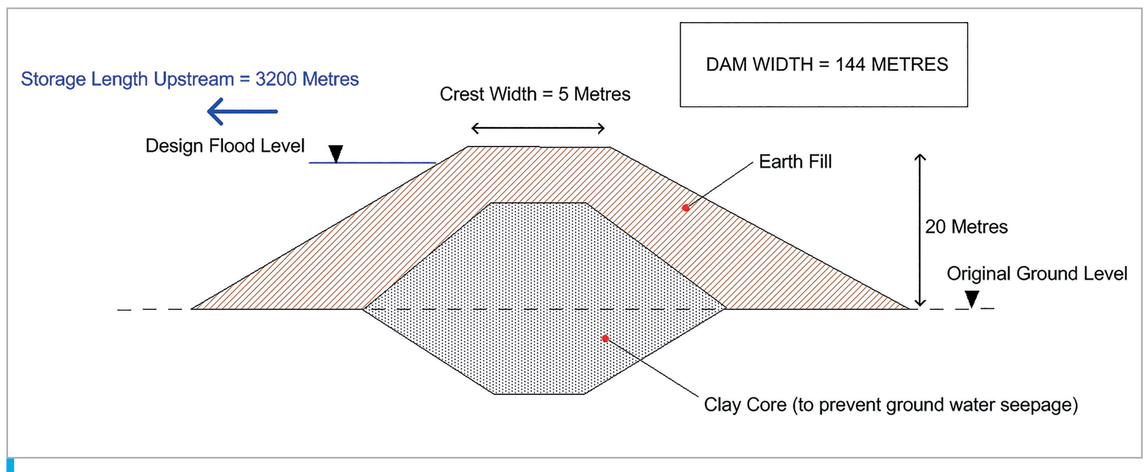

Figure 13: Cross section shows required dimensions of an earth dam on the River Earn.

For comparison, the existing Glen Lednock reservoir dam is approximately 40 m in height and 275 m wide. A plan indicating the proposed location of these two storage areas is shown in figure 14.

Earth dams have been used to cost the upstream storage option, but based on a more detailed assessment, it is possible that concrete dams would be a more preferable solution as they would require less land take. However a concrete dam is likely to be more expensive to construct and would result in a lower benefit/cost ratio for this option.

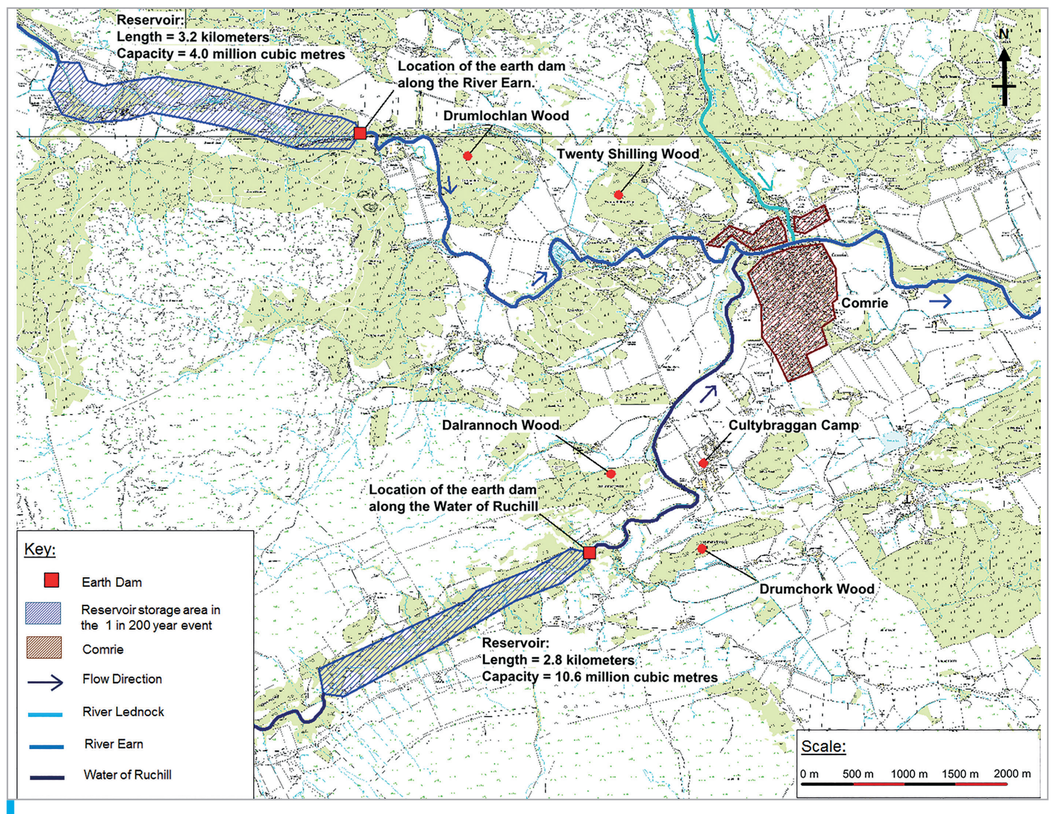

Figure 14: Approximate location of the River Earn and Water of Ruchill storage areas.

Option Cost and Benefits

The estimated total cost of this option is **£69.3 million**. The overall calculated benefit/cost ratio for this option is **0.69.**

Advantages

- The defences would provide an effective flood defence for up to the 1 in 200 year flood event without the need for new defences being constructed in the village.
- This would enable enhanced biodiversity through habitat and wetland creation.

Disadvantages:

- There would be major environmental impacts resulting from dam construction which would impact ancient woodland and farm land.
- The option would require significant land take to construct the dams resulting in large compensation for land owners. This is likely to be unacceptable to the land owners concerned.
- Agreement would be required with multiple stakeholders in order to implement this option which would be very challenging.
- The cost for this option is estimated to be very high, with a benefit cost ratio of less than 1.0.

For the reasons discussed above, this option is therefore not considered to be feasible and been discounted.