

CASE STUDY 6

BELLFIELDS FARM

FARMING FLOODPLAINS for the FUTURE

Catchment	Penk (Church Eaton Brook)
Holding Type	Mixed livestock (sheep & cattle)
Existing Land Use	Species-poor, semi-improved grassland
Project Area	4.2ha [Total holding : 93ha]
Techniques	Flood storage ; small-scale habitat creation



Field-edge bund - before and after works, and during flood



Background

Entirely down to grass, Bellfields Farm is managed to provide feed, in the form of grazing and fodder (hay and silage), for both sheep and beef cattle. Key watercourses cross the holding, including a tributary carrying the main drainage from Church Eaton, and the Church Eaton Brook itself.

Conscious of their custodial role as farmers and aware of flooding as a major issue (not least because of flood problems in the village of Church Eaton), the landowners contacted the project, considering that they farmed areas of land that might be beneficial in the meeting of Farming Floodplains for the Future objectives.

The Project

Utilising the existing topography of a field lying adjacent to the confluence of the two watercourses associated with the village of Church Eaton, a flood storage scheme was devised, incorporating minor habitat enhancements.



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Consultations.....

- Biological Records
- Natural England (re HLS agreement and funding)
- Environment Agency (re need for consent)

.....& Consents

- None required

Church Eaton Brook is designated by Defra as 'main river'. Therefore in order to avoid the need to obtain Flood Defence Consent for the scheme, no part of the works has been allowed to fall within 8 metres of the top of the Brook bank (see dotted red line on map).

- 1** The main element of the scheme is a 415 metre long embankment running parallel to the Church Eaton Brook and along the southern boundary of the field. This defines the extent of flood storage, with the latter part required to prevent any adverse impact on the neighbouring landowner. Tied into higher ground at either end, the earth bund averages 0.62 metres in height above existing ground level (increasing to a maximum of 0.97 metres where spanning existing low spots). The footprint of the bund averages 6.5 metres in order to generate shallow slopes suitable for maintenance with standard tractor-mounted machinery.
- 2** Outflow from the flood storage area is via two 150mm diameter pipes through the bund, outfalling to the Church Eaton Brook. Both are fitted with flap valves on the downstream end, to ensure that during flood conditions water cannot flow up the pipes from the Brook. Should the flood storage area fill, a low section in the eastern corner of the bund acts as an overflow.
- 3** All material for construction of the bund was sourced from site. This was primarily generated through the lowering of areas of high ground, targeted so as to also increase the storage capacity of the scheme. As the field has returned to agricultural management, all topsoil was removed (including from the line of the bund) and replaced (with the farm re-seeding as appropriate).
- 4** Water feeds into the flood storage area via a spillway in the right bank of the tributary watercourse at the upstream end of the field, created by accentuating and extending an existing low spot in the bank. Minor re-profiling within the field ensures that any water coming over the spillway effectively flows into the flood storage area.
- 5** Taking advantage of an existing low spot, one of the outfall pipes has been set above ground level, such that inside the bund water is retained to create a small pool.
- 6** A second semi-permanent pool has been created through accentuation of an existing low spot in the field.

Issue

The scheme flooded relatively soon after completion in early winter 2009. While confirming the success of the design, the rainfall event was notable but not excessive. This suggests that the storage may function more frequently than originally intended (reducing effectiveness in terms of flood risk management and potentially bringing a greater than anticipated impact on the farm business). If this proves to be the case, rectification will simply require the import of material to slightly increase the height of the spillway.



Bund adjacent to Church Eaton Brook

Future Management

- The flood storage element of the scheme should be self-sustaining (as already demonstrated), maintenance restricted to ensuring the pipes are not blocked. On-going monitoring is required for the time being to confirm the spillway has been set to the right height (see 'Issue' box).
- The grassland is already included in an HLS agreement – once the sward has re-established, management will continue as per the agreement prescriptions. Implementation and functioning of the scheme should not in itself affect this management, although extra vigilance may be required during flood events to ensure livestock safety.
- The landowner is keen to attract breeding waders to the site (lapwing have been recorded breeding on an adjacent holding) – in time additional work may be undertaken to enhance the habitat further.



Pool with church beyond

Benefits

HYDROLOGICAL	New flood storage scheme, capacity approximately 6150m ³ (water stored over 1.8ha at an average depth of 0.34m)
HABITAT	Scheme implemented with minimal impact on semi-improved grassland included in HLS agreement. Two new ponds created.
FARM BUSINESS	The holding is already in a Higher Level Stewardship agreement, the field in question managed under the restoration of grassland for target features (HK16) and mixed stocking (HK5) options. However given flood management is a secondary objective of HLS, Natural England deemed the scheme eligible for the raised water level supplement (HK19), bringing the landowner an extra £336 per year.



Route for water into storage area - after works and during flood



Costings

Earthworks (inc materials)	£ 5652	Natural England Grant (via HLS)	£ 1455
TOTAL	£ 5652	Landowner Contribution	£ Re-seeding costs
		Farming Floodplains for the Future	£ 4197

[Prices excluding VAT]