

6.3 Removing and setting back floodbanks

LONG EAU

LOCATION - MANBY, LINCOLNSHIRE TF407863

DATE OF CONSTRUCTION - MAY - JUNE 1995

AREA - 16ha

COST - £60,000

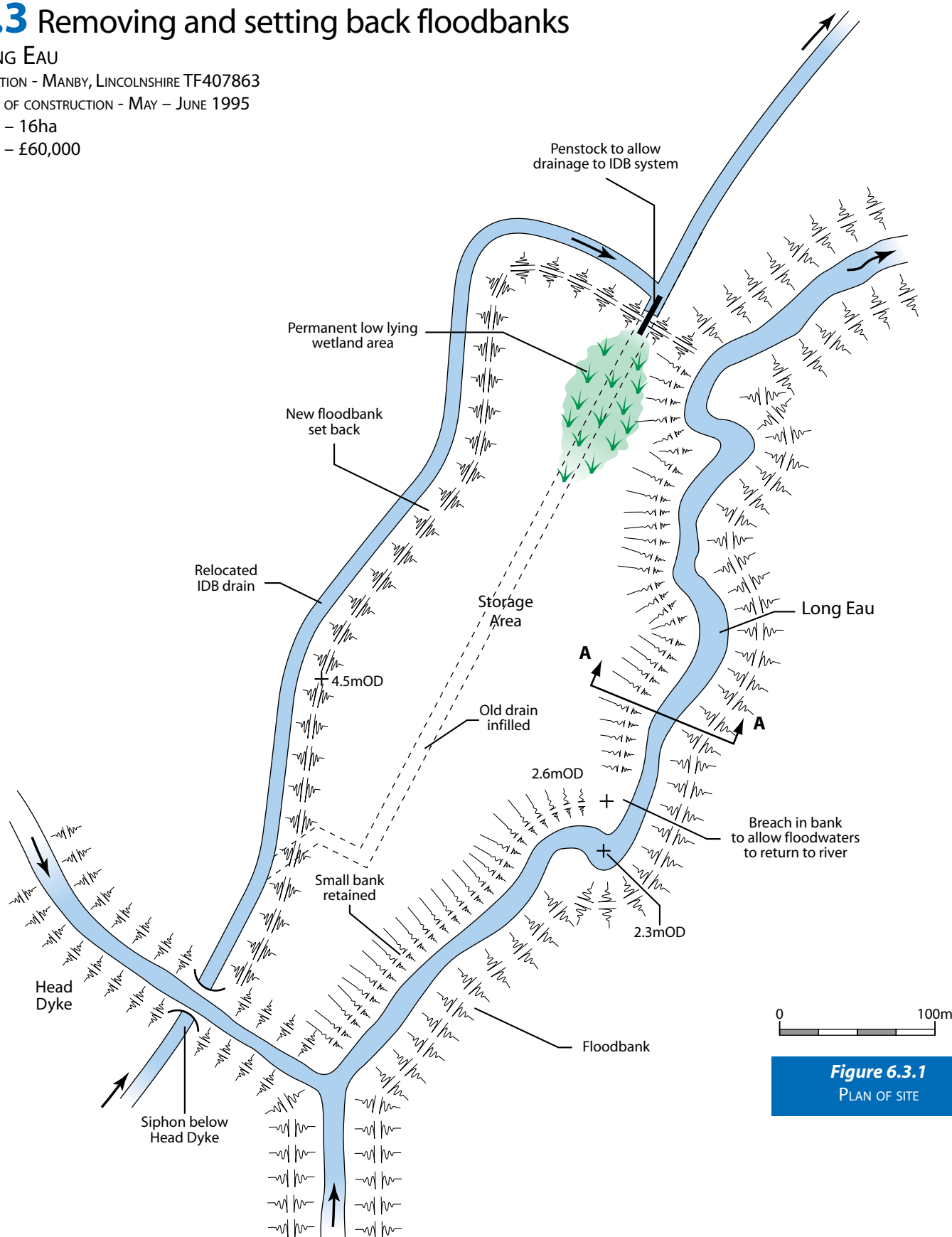


Figure 6.3.1
PLAN OF SITE

Managing Overland Floodwaters

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Removal of the left floodbank and marginal berm creation on the Great Eau at Withern

Description

The Great and Long Eau drain large areas of predominantly agricultural land. Both rivers have been heavily modified and embanked to increase capacity to protect the surrounding land, and both are high-level carriers relative to the surrounding land. Regular dredging to maintain capacity has removed any natural substrate.

Three sites were chosen along the Long and Great Eau to demonstrate improved flood protection standards through a process of setting back floodbanks previously located along the riverbank. At each site the floodbank was removed and a flood storage area created on adjacent land. The site selection process also took into account the opportunity to combine floodplain restoration with river channel enhancement and marginal habitat creation.

Landowner support was key to the implementation of the schemes, and some form of financial incentive was essential to landowner support. Farming and Wildlife Advisory Group (FWAG) and the Countryside Commission helped landowners successfully enter into the Countryside Stewardship Scheme, to gain compensatory funding of a total of £60,000.



Relocating the IDB drain and set-back floodbank

Apart from in the upper reaches, the majority of the Long Eau has little gradient and is virtually bereft of any habitat structure. There is little contact with the previous floodplain as the river has been deeply dredged, and seasonal over-topping cannot occur due to high floodbanks.

Design

Long Eau – Manby

The left floodbank was lowered to just above ground level, so still retaining a low embankment. The field-side slope was widened and flattened to 1 in 10 as this would now act as an overspill. The river-side bank was also re-profiled, sloping gently down to a wet berm up to 2m wide where marginal plants could establish.

The 2100m³ of spoil from the bank removal was used to fill in an Internal Drainage Board drain that ran through the centre of the proposed storage area. This had to be re-routed behind the new 'set-back' floodbank to maintain the integrity of the upland and lowland drainage system. Material excavated from the construction of the new drain was used to form the new floodbank, set back from the river by up to 300m. The new bank is large due to the volume of material that needed to be excavated to re-route the IDB drain. The new embankment is constructed of clay with slopes of 3:1 to a height of 2.5m to 2.7m above the adjacent ground level. This gives a designed crest level of 4.5m above OD with a crest width of 3.5m minimum. The volume of material used for the embankment was 18,500m³.





View along the trapezoidal right bank of the Long Eau



View from the new embankment across the restored floodplain showing wintering wildfowl – January 1999

The project team and landowner were keen to avoid prolonged springtime surface inundation by floodwater trapped in low lying pockets and not returning to the river. Where such areas were evident the bank was lowered locally to allow drainage back to the river as river levels subsided, as well as into the area as levels rose. As the water depths lower through gravity drainage and evaporation a penstock can be accessed by the landowner to discharge water to the IDB system to allow the grass sward to recover for early summer grazing.

Long Eau - Little Carlton and Great Eau - Withern

Similarly, upstream at Little Carlton the floodbanks were removed and set back, and at Withern the natural rise in slope was used to contain floodwaters without the need to replace the bank. As with Manby both sites included work on the floodplain and river's edge, creating scrapes, reedbeds, berms, riffles and, where suitable, exposed cliff faces.

Subsequent performance 1995 – 2001

Initial hydrological modelling indicates significant local benefits, including an increase in the standard of protection over a 3km stretch of the Long Eau at Little Carlton and at Manby.

Long Eau, Manby

Water will spill onto the site from the Long Eau when levels reach 2.6m above OD and has reached a maximum of 4m above OD. Levels are then reliant on conditions in the Eau subsiding and, depending on the intensity of the event, have been retained for two or three days. Below the Eau level of 2.6m, 75% of the washland will retain water to a depth of up to about 0.5m. This can remain for 3-4 months providing ideal conditions over the winter months for dabbling and grazing ducks such as widgeon, teal, gadwall and mallard.

Waterfowl and waders have increased on the floodplain. Lapwing and redshank have bred on the site. Flocks of over 60 redshank and snipe, curlew, ruff, common and green sandpiper are amongst the birds that use the washlands in the winter.

Original Information Provider:
Phil Smith

Water is designed to spill onto the 16ha site from the Long Eau when levels reach 2.6m above OD, just 0.3m over their normal retained level. This floods progressively outwards from the old course of the IDB drain, which represents the lowest levels within the area. This low spot remains damp for much of the year, the downstream end forming a permanent wet scrape/shallow pool.

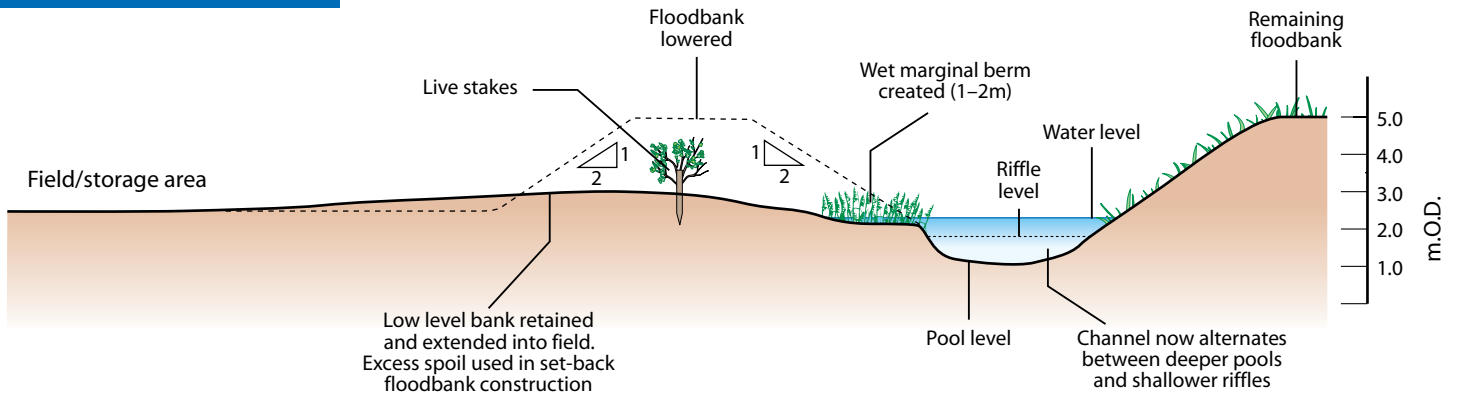


Floodplain, penstock and permanent wetland area
– October 2001

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Figure 6.3.2
SECTION A THROUGH FLOODBANKS



Berm at section A after 4 years

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6.3 Long Eau 2013 Update

The downstream flood peak has been reduced as water spills out into the floodplain and is held in the storage area. As the land was previously used for arable farming, the drainage at this site was good. This meant that initially water retention in the storage lagoon was limited. Progressively, with more frequent flooding and a change to the grazing regime, water has been retained for longer periods.

The scheme has coped well with recent floods, with some water successfully retained from winter through to the spring, and there is no evidence of negative impacts upstream or downstream. This has provided confidence to reduce vegetation management within the adjacent reach.

Initially the farmer (landowner) was disappointed that the storage area reduced the area available for grazing. However, he was able to work this into his livestock management plan and is now happy with the situation.

Wetland habitat has been created and wildfowl continue to be attracted to the site. Although not part of the original plan, a public access bird hide has been created by the landowner and this is well used by bird watchers.

River Long Eau	Low energy, clay
WFD Mitigation measure	
Waterbody ID	GB105029061670
Designation	None
Project specific monitoring	None

This site provides a good example of the benefits of working with natural processes, and the Environment Agency has successfully used the same technique on other sites. A farmer upstream has used a similar technique, and has also seen an increase in overwintering and breeding wildfowl and waders.

There were complications in construction due to the diversion of the IDB drainage system which made the project expensive. Future projects should try to avoid this.



Floodplain, penstock and permanent wetland area 11 years on – August 2012

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