

Oxford Flood Alleviation Scheme

SCOPE OF WORK FOR THE FLOODPLAIN MEADOWS PARTNERSHIP

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Background

Various parts of the city of Oxford flood when the level of the river is higher than its normal winter levels, causing damage to property, disruption to business and travel and creating risks to health.

The proposed solution is to create a "two-stage channel", between the A34 to the west and the railway to the east, to carry excess flow from the Seacourt Stream, Bulstake Stream and Hinksey Stream channels. The aim is to increase the proportion of river flow which uses Seacourt Stream and/or the new channel during a flood event, thereby reducing the water level in the main River Thames and so reducing the frequency of flooding in built-up areas. A number of hard defences (bunds and walls) are also proposed, to protect houses which would otherwise continue to flood even with the reduced river levels, and a number of new culverts and bridges are needed to maintain access routes.

The land on which the Oxford FAS is proposed to be built is largely within the floodplain of the River Thames. The land floods during normal winter flooding, from various channels of the Thames. This winter flooding is part of the normal functioning of the river.

An overall plan of the scheme and typical cross sections of the 2 stage channel can be found at Appendix [A](#).

Environmental Impact Assessment

A full environmental impact assessment is being undertaken on the scheme and a Scoping Report has been sent to Oxfordshire County Council, seeking their opinion on the proposed content and methodology of this assessment. The report can be found at Appendix [B](#).

Environmental Objectives

Environmental objectives have been set for the project relating to landscape, heritage, biodiversity, the Water Framework Directive and recreation. The Biodiversity Objectives are:

- B1.** To achieve a net gain in biodiversity.
- B2.** To minimise impacts on existing high quality sites and to fully mitigate or compensate for unavoidable impacts.
- B3.** To create a diverse wildlife corridor to the west of Oxford that links up existing wildlife sites and increases opportunities for local communities and visitors to access the natural environment.

Scope

The scope of work outlined below will help us to design a scheme that meets our environmental objectives and to undertake a thorough environmental impact assessment.

Site visit

As part of our landowner engagement process we physically marked the channel out between Botley Road and Old Abingdon Road for viewing by landowners during the week commencing Monday 5 December.

Task 1: Undertake a one day site visit with relevant members of the Oxford FAS project team to see the proposed channel marked out on the ground and to look at the wider area with a view to undertaking Tasks 2-8, as set out below.

FMP: undertaken site visit. Costs included in quote.

Mitigation for the Impacts of the Oxford FAS on Existing Floodplain Meadow

As set out in Biodiversity Objective B2, we want to minimise the impacts of the scheme on existing high quality sites and to fully mitigate or compensate for any unavoidable impacts.

Hinksey Meadow

Part of the floodplain that is going to be directly affected by the scheme is Hinksey Meadow, which is owned by Oxford Preservation Trust (OPT). This is a floodplain meadow and is known to support the nationally-rare grassland community, MG4a and the protected plant species snakes-head fritillary.

Local ecologist, Tim King, has been surveying the meadow for several years and has kindly supplied us with his survey results and reports, which can be found at Appendix C. The draft NVC survey for the rest of the scheme can be found at Appendix D.

We need to assess both the direct physical effects of the scheme on the MG4a grassland and the effects that any potential change in hydrogeology might have upon the meadow.

A: Direct Physical Effects of the Scheme on the Floodplain Meadow

We have tried to keep the area of MG4a that will be physically affected by the scheme to an absolute minimum but the top of the second stage of the channel and possibly the contractor's access route will run along the western edge of the MG4a. The current estimate is that we will need to remove and translocate (if deemed appropriate) approximately 2ha of MG4a, although this may alter slightly as we develop the detailed design.

Possible options for a receptor site for the MG4a are:

- a) Replacement in Hinksey Meadow as a strip at the top of the two-stage channel.

A major benefit of this is that it would provide continuity with the existing meadow. However, it would not be possible to do a direct translocation and the turves would need to be stored for a period of time while the channel was excavated and the receptor site was prepared. There is also the risk that the lowered ground might be too wet to support an MG4 or MG4a community.

- b) Transfer to another site on the floodplain that is outside the two-stage channel and has similar properties to Hinksey Meadow.

If a receptor site were to be prepared in advance of lifting the MG4a turves, then they could be directly translocated, without the need for storage. However, the receptor site might require a lot of preparation to make it suitable (e.g. topsoil stripping) and it is very likely that the maintenance regime of the area would need to be altered. A small, isolated area of MG4 would not be as successful or as ecologically desirable as a large area that is linked to other meadows, so it would probably be necessary to have a large receptor site, where there is a mix of translocation and creation of meadow using green hay or seed. Oxford Preservation Trust have identified a site at Old Marston on the Cherwell where they would like some of the mitigation to occur. They have suggested that they would like any turf to be translocated to that site.

Task 2: Provide advice on the potential translocation of the MG4a grassland. Suggested methodology, timing, range and suitability of possible receptor sites.

FMP work required:

- **Literature review and summary of our own direct experience?**
- **Assessment of site suitability (this might require some ground investigations?) e.g. soil P, soil water levels in those fields where could be receptor sites – would need to get EA to**

put piezos in specified fields and then allow time for at least one seasons worth of data...if not two on all possible sites, before final sites confirmed? Is there sufficient data in the groundwater and soils reports already for this? Need to specify which fields in the report due in March 2017

B. Indirect Hydrogeological Effects of the Scheme on Floodplain Meadow

There are a number of groundwater-sensitive habitats close to the proposed scheme, including Port Meadow (part of the Oxford Meadows Special Area of Conservation (SAC)) to the north, Iffley Meadows Site of Special Scientific Interest (SSSI) to the south-west, Hinksey Meadow and some of the smaller river channels, including the introduced colony of creeping marshwort in North Hinksey Meadow. Understanding the potential effects on these is an important part of the Environmental Impact Assessment.

Task 3: Review the Environment Agency's assessment of potential effects on other groundwater-sensitive sites.

FMP work required

- **Read groundwater report**
- **Check modelling**

A Groundwater Report has been produced by CH2M (Appendix E). This sets out the anticipated changes in groundwater levels that will occur under various flood scenarios and under normal conditions. The Ground Investigation Report at Appendix F contains important information relating to strata.

Task 4: Use the findings of the Groundwater Report and the Ground Investigation Report to explain how the anticipated change in groundwater levels are likely to affect the MG4/MG4a floodplain meadow at Hinksey Meadow in terms of species composition, NVC classification and long-term viability. Specific questions that we have are:

- **Is there likely to be a discontinuity between the groundwater levels in the gravels and the overlying alluvium that acts as a 'buffer' to changes in groundwater levels?**
- **Are the MG4/MG4a species at the wet end or the dry end of their tolerance range?**
- **Does the groundwater report provide sufficient information to allow a confident prediction of how the scheme will affect the hydrological regime of the remaining part of Hinksey Meadow in the growing season?**
- **Should we be putting piezometers within the MG4 on Hinksey Meadow this winter and if so, how many and where?**

FMP work required

- **Once the above task completed, use information to answer these questions above.**
- **Piezo number and location to be identified on a map.**
- **Soil moisture release curve required?**

Opportunities to create Floodplain Meadows as part of the Oxford FAS

Floodplain meadow within the 2-Stage channel

We would like to gain a better understanding of whether it will be feasible to create floodplain meadow within the footprint of the 2-stage channel. Our current thoughts are that it is likely to be too wet on the lower slopes, but that conditions may be favourable on the middle to upper slopes.

Task 5: Provide recommendations on how we should be monitoring and assessing the ecological trial areas and using existing features in the landscape, to gain a better understanding of which parts of the channel (if any) will be suitable for MG4/floodplain meadow.

FMP work required

- **Suggest that at least one of the trial areas is re-profiled to replicate that on the drawings of the two stage channel, and not spread with lots of top soil, but left as it could be with a thinner layer to minimise soil fertility. Then re-seeded, so we have a more accurate representation of the channel profile and final soil conditions. Seeding could be mixed with MG4 type seed at the top and wetter MG8 type seed towards the bottom. Even if the system is grazed, we might still hope to see a species rich sward develop.**
- **Someone from the FMP be present on site when this is being done to observe what is actually done.**
- **Draw up a monitoring plan for the trial areas.**

Floodplain meadow outside the 2-stage channel

We would like to gain a better understanding of whether it will be feasible to create floodplain meadow/MG4 in the fields on either side of the 2-stage channel, in the wider floodplain.

Task 6: Provide recommendations on which areas within the wider floodplain might be most suitable for the creation of floodplain meadow/MG4 and the work that would be required to enable us to identify, prepare and establish such areas.

FMP work required:

- **Based on the hydrological and hydro geological report. Identify possible areas.**
- **Map all possible sites digitally.**
- **Site visit to all areas identified to get some basic data.**
- **Draw up a pre-restoration assessment plan for each site (identify what data are needed for each site to determine suitability for restoration and identify method for restoration where possible).**

Maintenance and Monitoring Work Required

The scheme, including any environmental mitigation and enhancement works, will be maintained by the Environment Agency for a minimum of 5 years, during which time a programme of monitoring will need to be put in place. Knowing that new floodplain meadow can take many more years than this to establish and fully develop, ideally this monitoring will be continued well beyond the 5 years.

Task 7: Provide recommendations on the type of monitoring that should be undertaken on the existing floodplain meadow in order to ensure that the environmental objectives of the scheme are being met.

Work required:

- **Look at Hinksey meadow and what will remain. Produce a grid for monitoring (MED) quadrats and set out lists of tasks such as soil samples, hydrological assessment and regularity of botanical data collection. Cost this**

Task 8: Provide recommendations on the maintenance and monitoring that should be undertaken on any translocated floodplain meadow and newly created floodplain meadow in order to ensure that the environmental objectives of the scheme are being met.

Work required:

- **Produce a grid for monitoring (MED) quadrats and set out lists of tasks such as soil samples, hydrological assessment and regularity of botanical data collection. Cost this. For each of the possible /most likely sites for restoration.**

Programme for Delivery

Early January 2017 –Interim advice on any additional groundwater monitoring requirements at Hinksey Meadow and/or ecological trial areas (Tasks 4 and 5)

31 March 2017 - Draft Report

21 April 2017 – Final Report