Stodmarsh Stream Enhancement Scheme

Delivery Proposal

Date: 18/07/2025 **Project ref. GSL14/Stodmarsh_ODG**

Report produced by Greenshank Environmental Limited on in collaboration with Oliver Davis Group Ltd.

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Version history

Version number	Produced by	Role	Date
V1	Dr Gabriel Connor-Streich	Director and Principal Environmental Scientist	21/03/2025
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1 Introduction

Under the Conservation of Habitats and Species Regulations (as amended) 2017 (the Habitat Regulations), aquatic Habitats Sites may have Conservation Objectives Supplementary Advice that identifies the need to manage elevated nutrient inputs[1]. Following a ruling in the Court of Justice of the European Union referred to as the 'Dutch N Case'[2], Local Planning Authorities (LPAs) now require planning applications to consider the potential impact that projects and plans may have on nutrient inputs to Habitats Sites that are not meeting nutrient-related conservation objectives. Where a project or plan is evidenced to increase nutrient inputs to a Habitats Site that is under pressure from nutrients, it will not be possible to conclude no 'adverse effects on integrity (AEoI)' through a Stage 1 Habitat Regulations Assessment (HRA). Thus, a project or plan will need to evidence how it will secure nutrient mitigation to remove the risk of AEoI on a Habitats Site. The evidence underpinning a mitigation scheme can then be used to support an HRA Appropriate Assessment (AA) showing how the project or plan can proceed without AEoI, thus achieving nutrient neutrality.

The Stodmarsh Special Area of Conservation / Special Protection Area / Ramsar site (hereafter the Stodmarsh Habitats Sites; Figure 1) has been identified as not meeting conservation objectives due to elevated levels of nitrogen (N) and phosphorus (P) inputs. As such, projects and plans that are evidenced to result in an increase in N and P inputs to the Stodmarsh Habitats Sites will require nutrient mitigation in order show compliance with the Habitat Regulations through an HRA. This requirement has placed a significant barrier on the ability for LPAs to grant planning permission for development across large areas of Somerset, with the impacts being felt most acutely in the residential development sector.

Various private providers of N and P mitigation have begun to offer mitigation solutions within catchments affected by nutrient neutrality. Mitigation is being sold as N and P credits in units of kg TP/year and kg TN/year[3], to align with nutrient budgets for new developments which are also quantified in units of kg TP/year and kg TN/year. While mitigation schemes are beginning to bring N and P credits to market, there are still few mitigation options available to developers, resulting in significant barriers to new development and resultant impacts on the local economy.

Agriculture is known to be a significant source of nutrient pollution to aquatic systems (Withers et al., 2014; Withers & Lord, 2002). As such, mitigation schemes targeting agricultural exports of N and P are a key tool for addressing the challenge posed by Nutrient Neutrality. Oliver Davis Group Ltd have engaged with Greenshank Environmental (Greenshank) to progress a mitigation scheme on farmland under the control of Oliver Davis Group Ltd. Greenshank have identified mitigation options within the River Stour catchment which can serve development in Ashford, Canterbury and other settlements that contribute nutrients to the Stodmarsh Habitats Sites.

In the Stodmarsh Habitats Sites catchment and other catchments affected by Nutrient Neutrality, many of the mitigation schemes proposed to date have used fallowing approaches to cease nutrient inputs from agricultural operations. However, fallowing

[1] E.g., Natural England. Site Improvement Plan, Stodmarsh

[2] Joined Cases C-293/17 and C-294/17

[3] TP = total phosphorus, TN = total nitrogen

strategies are not able to meet the scale of the long-term demand for nutrient. We recognise that there is a need for nutrient mitigation schemes to work in tandem with agriculture, especially at a time when food security and food price inflation are key issues for the wider public.

The proposed mitigation scheme on land owned by Oliver Davis Group Ltd aims to reduce the nutrient load carried in a drainage ditch/watercourse that transports nutrient rich water to the Stodmarsh Habitats Sites. This approach has a dual benefit: firstly, targeting watercourses that transport diffuse and point source nutrient pollution from surrounding land uses provides the opportunity to deliver a notable quantum of mitigation with limited land take; secondly, the areas of farmland proposed for the deployment of the mitigation options tend to be affected by frequent inundation and waterlogging, meaning they are of low agricultural value.

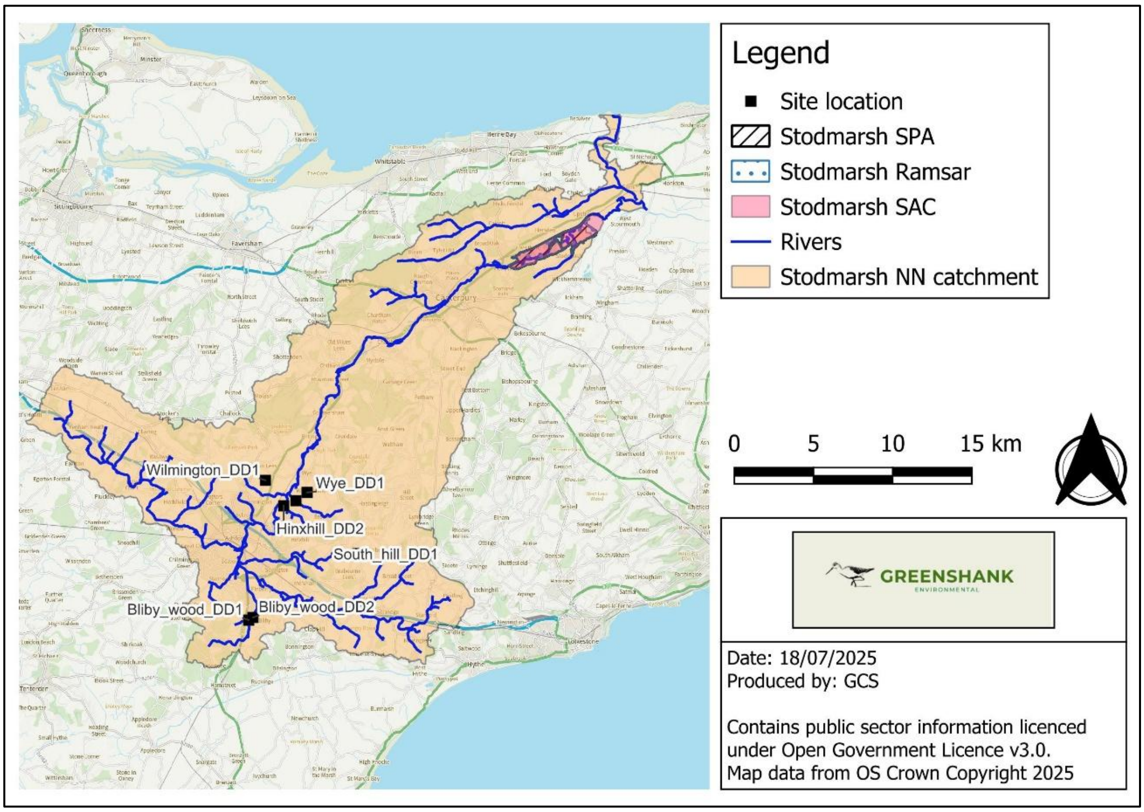

Figure 1: The Stodmarsh Habitats Site catchment and the location of the proposed Stodmarsh Stream Enhancement Scheme mitigation options.

1.1 Scheme conceptualisation

The core concept underpinning the Oliver Davis Group Ltd / Greenshank mitigation scheme is to intercept pathways of nutrient transfer to the Stodmarsh Habitats Site. This approach is based on the source-pathway-receptor model of environmental pollution, which is commonly applied in studies and guidance on the management of environmental pollution (e.g., Environment Agency, 2011; Packham et al., 2020). Organic and inorganic fertiliser use as well as direct inputs of livestock excreta, are the main diffuse sources of N and P to the environment. Point source inputs of N and P to the environment from sewage treatment and livestock yards can also be large nutrient sources within a catchment. These sources of N and P are transported along surface and subsurface flow pathways to receiving waterbodies where the increase in N and P inputs can result in eutrophication and associated deleterious effects on aquatic ecology (Miller et al., 2014). Figure 2 shows a conceptualisation of the proposed mitigation scheme. Mitigation options will comprise targeted land management approaches deployed at key locations on Oliver Davis Group Ltd landholdings.

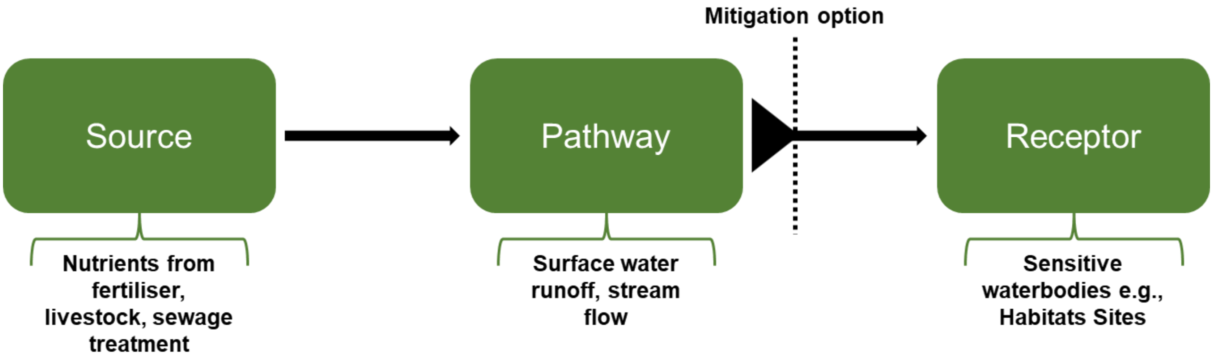

Figure 2: Conceptual diagram showing how the proposed mitigation scheme will intercept pathways for nutrient sources to reach receptors, reducing nutrient inputs to receiving environments and providing mitigation.

1.2 Site details

The Stodmarsh Stream Enhancement Scheme is proposed at seven locations within the River Stour catchment. The watercourses at each of these locations will be reprofiled as per the design specifications detailed in the Technical Appendices that accompany this report. The scheme locations have been chosen due to the existing, heavily managed characteristics of the watercourse and the significant potential to increase habitat quality while also generating nutrient mitigation. A summary of each of the sites is shown in the sub-sections below.

1.2.1 Hinxhill_DD1

The Hinxhill_DD1 site comprises a 435 m reach of Spider Castle Dyke (Figure 3; NGR: TR 04719 45079). The watercourse at this location is designated as a Main River and Water Framework Directive (WFD) waterbody, being part of the Great Stour between Ashford and Wye waterbody (waterbody ID: GB107040019741). It is heavily impacted by historic management for land drainage and agriculture, having been channelized, over-deepened and given a uniform trapezoidal cross-section). There is a lack of any notable riparian vegetation and widespread signs of bank erosion (photos of the site are provided in the Technical Appendices). Habitat quality in the watercourse is homogenous and poor.

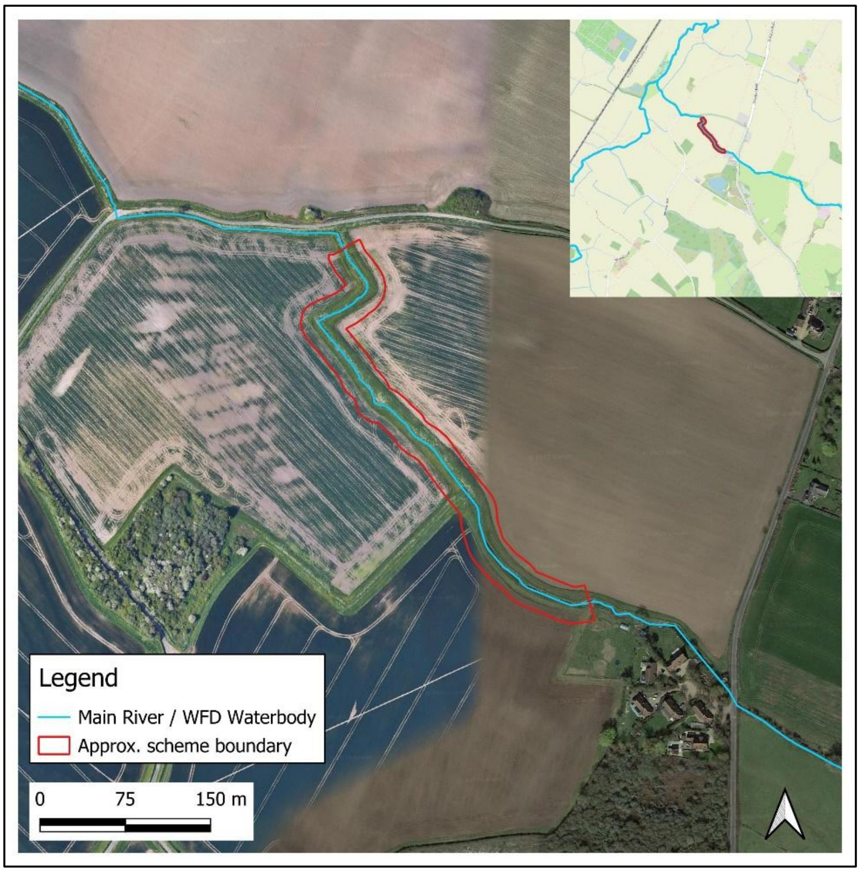

Figure 3: Map showing the scheme boundary for the proposed watercourse management option at the Hinxhill_DD1 site. The map also shows the designations of the watercourse at this location.

1.2.2 Hinxhill_DD2

The Hinxhill_DD2 site comprises a 250 m reach of an unnamed tributary of the Great Stour (Figure 4; NGR: TR 03934 44748). The watercourse at this location is an Ordinary Watercourse that is managed by the River Stour (Kent) Internal Drainage Board (IDB). It is heavily impacted by historic management for land drainage and agriculture, with a relatively straight planform and uniform trapezoidal cross-section. There is limited riparian vegetation, with some fairly isolated riparian trees and a species-poor mix of grasses and nettles in riparian zone of variable width (photos of the site are provided in the Technical Appendices). The channel shows widespread signs of bank erosion. Habitat quality in the watercourse is homogenous and poor.

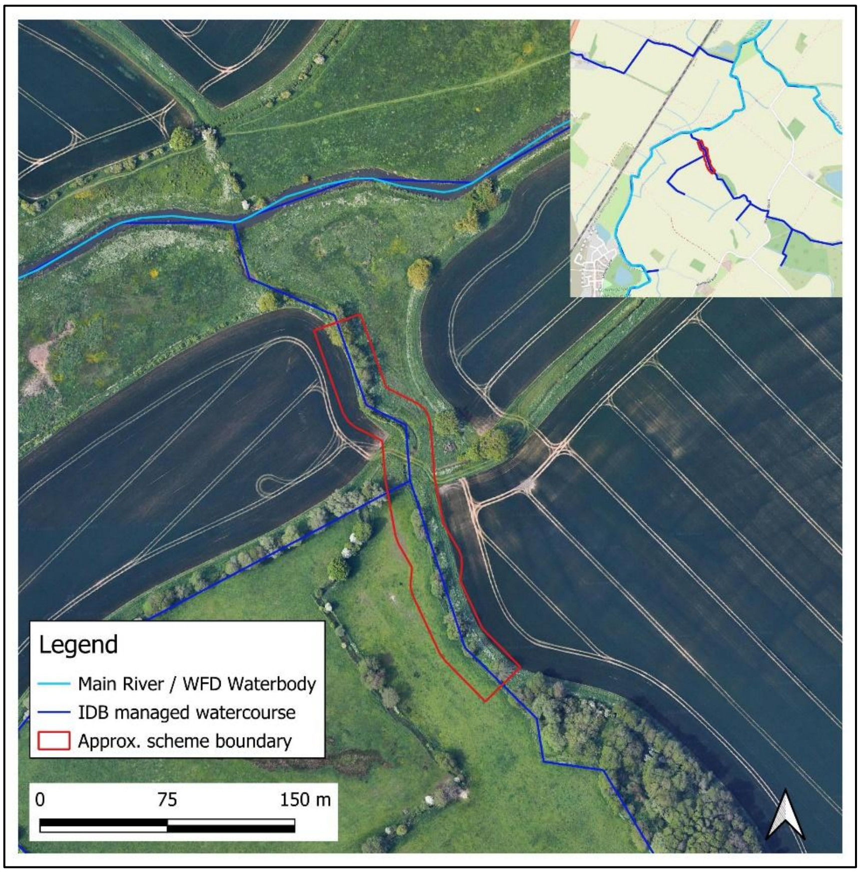

Figure 4: Map showing the scheme boundary for the proposed watercourse management option at the Hinxhill_DD2 site. The map also shows the designations of the watercourse at this location.

1.2.3 Wye_DD1

The Wye_DD1 site comprises a 359 m reach of an unnamed tributary of the Great Stour (Figure 3; NGR: TR 05422 45576). The watercourse at this location is an Ordinary Watercourse that is managed by the River Stour (Kent) IDB. It is heavily impacted by historic management for land drainage and agriculture, with a relatively straight planform and uniform trapezoidal cross-section. The channel is likely over-deepened with limited floodplain connectivity (photos of the site are provided in the Technical Appendices). There is limited riparian vegetation and habitat quality in the watercourse is homogenous and poor.

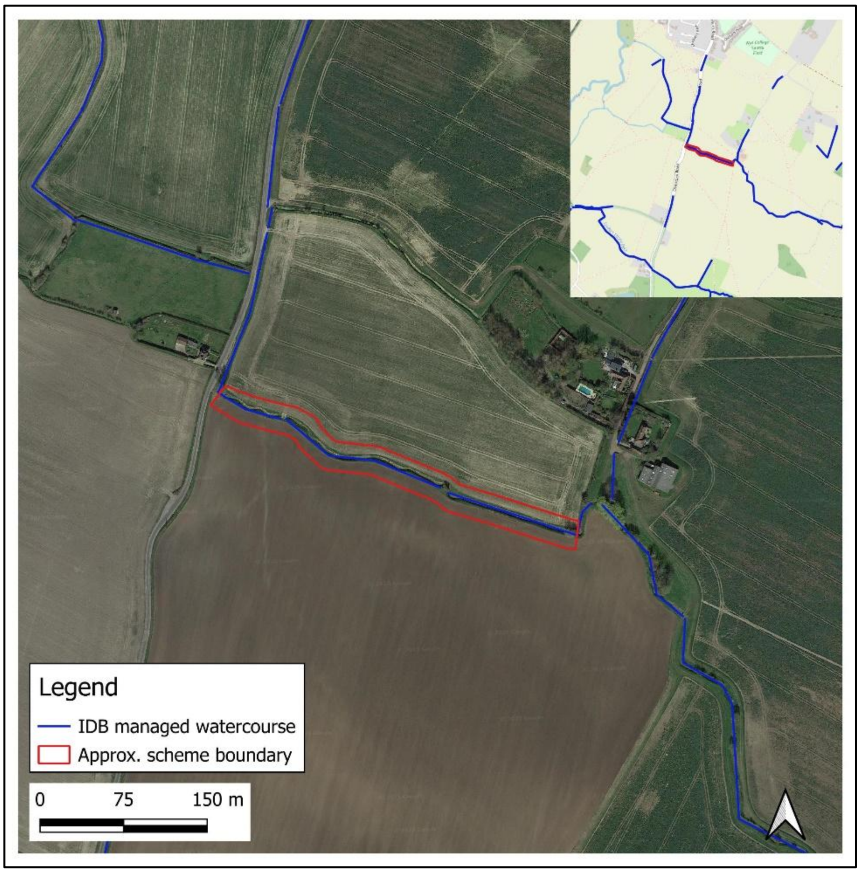

Figure 5: Map showing the scheme boundary for the proposed watercourse management option at the Wye_DD1 site. The map also shows the designations of the watercourse at this location.

1.2.4 Wilmington_DD1

The Wilmington_DD1 site comprises a 340 m reach of an unnamed tributary of the Great Stour (Figure 7; NGR: TR 02766 46390). The watercourse at this location is an Ordinary Watercourse. It is heavily impacted by historic management for land drainage and agriculture, with a relatively straight planform and uniform trapezoidal cross-section (photos of the site are provided in the Technical Appendices). There is limited riparian vegetation and habitat quality in the watercourse is homogenous and poor.

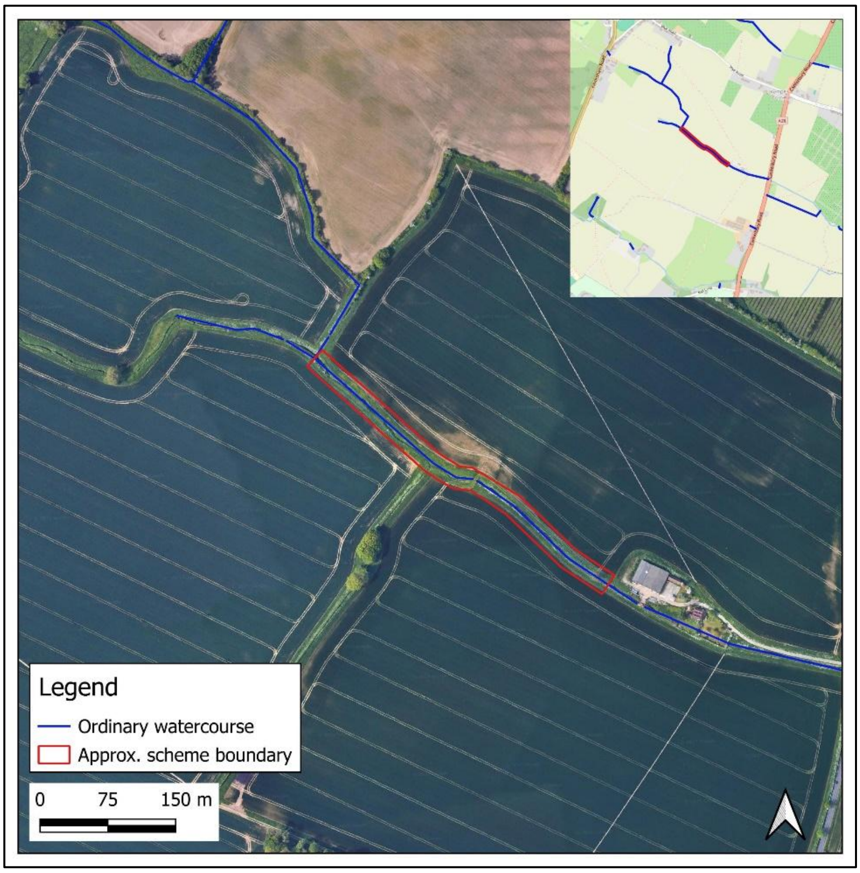

Figure 6: Map showing the scheme boundary for the proposed watercourse management option at the Wilmington_DD1 site. The map also shows the designations of the watercourse at this location.

1.2.5 South_hill_DD1

The South Hill DD1 site comprises a 300 m reach of an unnamed tributary of the Great Stour (Figure 7; NGR: TR 08654 41693). The watercourse at this location is an Ordinary Watercourse. It is heavily impacted by historic management for land drainage and agriculture, with direct inputs from field drains seen on an initial walkover of the site. The channel has a relatively uniform trapezoidal cross-section and poor habitat quality, with flow being quite turbid suggesting that the watercourse is impacted by fine sediment and associated nutrient inputs (photos of the site are provided in the Technical Appendices).

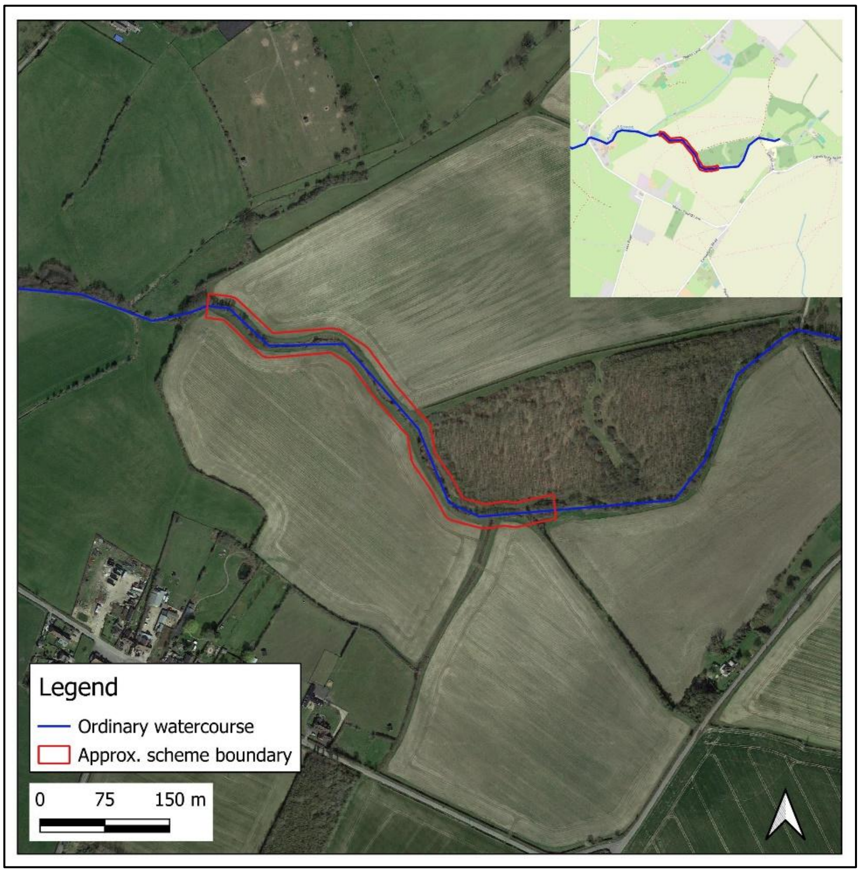

Figure 7: Map showing the scheme boundary for the proposed watercourse management option at the South_hill_DD1 site. The map also shows the designations of the watercourse at this location.

1.2.6 Bliby_wood_DD1

The Bliby_wood_DD1 site comprises a 520 m reach of the Ruckinge Dyke, a small tributary within the East Stour sub-catchment of the Great Stour (Figure 8; NGR: TR 01719 37388). The watercourse at this location is an Ordinary Watercourse which is managed by the River Stour (Kent) IDB. Historical management is evident, with the channel being heavily overdeepened and straightened. Flow in the channel is perceptible but very sluggish. This is likely due in part to dry conditions leading up to the time the channel was surveyed, but also due to the overdeepening of the channel. The channel bed shows notable signs of siltation, though this silt is likely to be remobilised during high flows. Channel cross-section is uniform and trapezoidal with poor habitat quality (photos of the site are provided in the Technical Appendices).

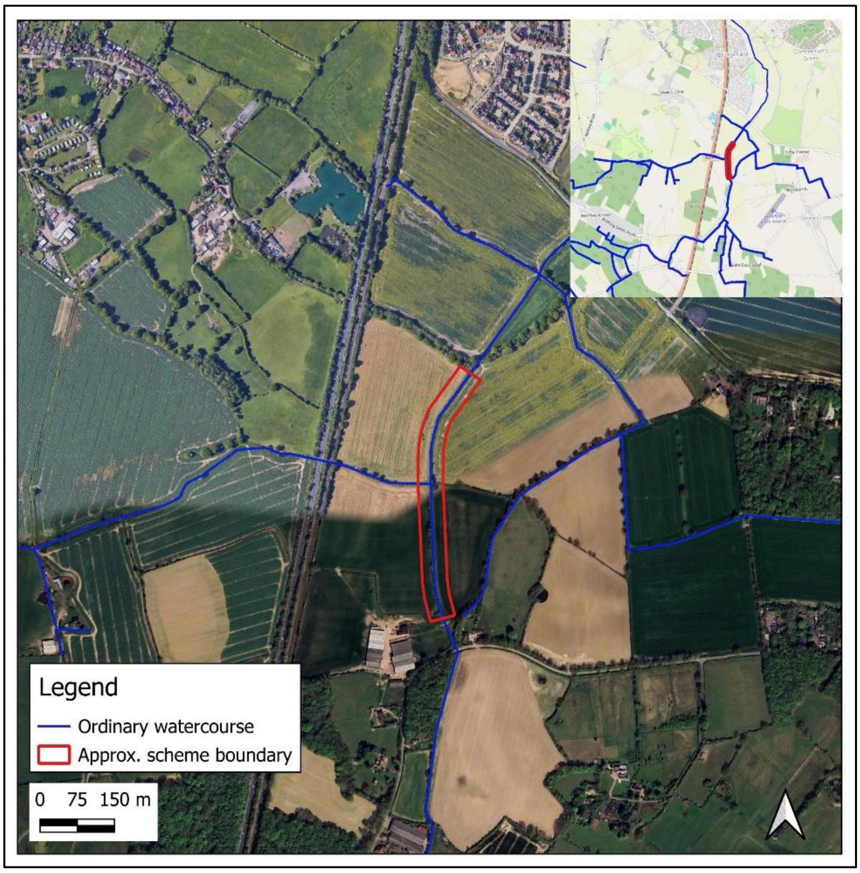

Figure 8: Map showing the scheme boundary for the proposed watercourse management option at the Bliby_wood_DD1 site. The map also shows the designations of the watercourse at this location.

1.2.7 Bliby_wood_DD2

The Bliby_wood_DD2 site comprises a 280 m reach of an unnamed drain that feeds Ruckinge Dyke (Figure 9; NGR: TR 02078 37613). The watercourse at this location is an Ordinary Watercourse which is managed by the River Stour (Kent) IDB. It has very similar characteristics to the Bliby_wood_DD1 channel, being overdeepened and straightened. The channel is smaller due to it draining a smaller catchment area. Flow in the channel was turbid, even at clearly very low flow velocities, suggesting fine sediment and associated nutrient inputs from channel's catchment. The channel cross-section is uniform and trapezoidal with homogenous and poor habitat quality (photos of the site are provided in the Technical Appendices).

Figure 9: Map showing the scheme boundary for the proposed watercourse management option at the Bliby_wood_DD2 site. The map also shows the designations of the watercourse at this location.

2 Proposed mitigation option

The proposed mitigation options follow the Enhanced Drainage Ditch Management framework (Connor-Streich, 2024a, 2024b). This is a novel approach to managing small watercourses and artificial drainage ditches in order create linear wetland features that treat nutrient sources from agricultural areas. Full details of the outline design for the proposed mitigation scheme are provided in the Technical Appendices that support this delivery proposal. The Enhanced Drainage Ditch Management methodology requires quantification of the baseline nutrient load input to each of the seven deployment locations, with this nutrient input reduced by the estimated percentage nutrient reduction efficiency associated with this management approach. In order to meet the requirements of the Enhanced Drainage Ditch Management framework and achieve the estimated nutrient reduction efficiency, a design process was followed. A summary of the steps required to quantify the nutrient input baseline and develop the outline design for the scheme is provided in the subsections below.

2.1 Quantification of mitigation potential

In order to quantify the mitigation potential of the proposed mitigation scheme, the following steps were used:

1. Map the mitigation site boundary

2. Map mitigation option deployment locations
3. Create a contiguous digital elevation model (DEM) for the mitigation site and upslope areas
4. Fill 'sinks' in the contiguous DEM
5. Delineate surface water runoff pathways
6. Define the watershed for the mitigation option
7. Determine land uses in the watershed
8. Calculate the area of each farm type within a watershed
9. Calculate the average annual rainfall (AAR) for the watershed
10. Determine the dominant soil drainage characteristics in each watershed
11. Check whether the watershed is within a Nitrate Vulnerable Zone (NVZ)
12. Identify the Operational Catchment
13. Correct nutrient export coefficients to account for losses of nutrients to groundwater
14. Select nutrient export coefficients and calculate baseline nutrient input
15. Calculate mitigation potential using the percentage reduction efficiency associated with an Enhanced Drainage Ditch Management design.

The accompanying Technical Appendices (Appendix A1) to this report provide a detailed description of how these steps were completed.

2.2 Design details

A summary of the key design elements of a drainage ditch management mitigation option is provided below, with a detailed description of the outline design of the mitigation options provided in the Technical Appendices (Appendix A3).

Design process summary:

1. Measure the dimensions of the existing trapezoidal watercourse
2. Estimate bankfull ditch widths based on a relationship between catchment area and channel widths of other watercourses within the Stour catchment. These estimated widths are used to guide the two-stage channel geometry.
3. Determine channel slope and whether this requires the use of low-grade weirs to reduce slope.
4. Use the current dimensions of the channels at the deployment locations and the estimated bankfull widths from Step 2 to inform the two-stage channel geometry.
5. Estimate the flow conveyance capacity of the reprofiled channels.
6. Estimate greenfield runoff rates for the catchments of each deployment location and compare these to the flow conveyance capacity of the reprofiled channels as a check against the ability for the scheme design to convey low return period flows.
7. Specify low-grade weir heights and spacing.

8. Plan how vegetation will be established within the reprofiled watercourse and in their buffer zones.

2.3 Additional benefits

It was beyond the scope of this proposal to provide a formal assessment of the additional benefits that may be provided due to the proposed watercourse design. However, the various elements of the watercourse design that result in slowing and storing water within the watercourse system are likely to deliver a range of ecosystem services above nutrient management. Table 1 provides a simple descriptive assessment of how the proposed watercourse design will promote these additional benefits.

Table 1: An overview of the additional benefits that may be provided by the proposed mitigation option.

Ecosystem services	Description of ecosystem service baseline	Description of improvement to ecosystem service baseline
Natural Flood management (NFM)	• The current watercourse morphology facilitates limited water storage within the channel. • Runoff entering the watercourse is rapidly transported to downstream waterbodies, resulting in potential increases in downstream flood risk.	• The proposed watercourse design will reduce flow velocities, slowing the onward transport of water from the upstream watershed to downstream waterbodies. • Slowing flow within the watercourse will promote additional water storage, both by pooling of water and increased infiltration. • Combined, these processes can provide NFM and may help to reduce downstream flood peaks.
Carbon sequestration	• There is limited vegetation both within the ditch and at the ditch margins. • This results in a low potential of the current watercourse to sequester carbon in vegetative biomass.	• Planting on floodplain benches and especially the establishment of trees in buffer strips adjacent to the watercourse will help to provide some limited increases carbon sequestration.
Habitat and biodiversity improvements	• The current watercourse is either heavily managed to facilitate local land drainage or has historically been straightened and deepened. • Habitat quality in the watercourse is low with limited benefits to biodiversity.	• The proposed watercourse design will increase floral diversity both within and adjacent to the watercourse. • This is likely to also improve faunal diversity within the managed section of watercourse.
Low flow support to rivers	• At present, the watercourse has limited capacity to slow flow and promote infiltration. • This may in turn impact baseflow inputs to downstream waterbodies.	• As detailed above, the proposed watercourse will slow flow within the ditch and promote infiltration. This may help to increase low flow support to downstream waterbodies by increasing baseflow.

Ecosystem services	Description of ecosystem service baseline	Description of improvement to ecosystem service baseline
Water resources management	• Due to the current form of the watercourse increasing the rate of transport of water to downstream waterbodies, it is likely that it does not help to regulate the availability of water for abstraction.	• By providing low flow support and generally attenuating the delivery of water to downstream waterbodies, the proposed watercourse design may help to regulate river flows, providing more consistent sources of water for abstraction with a benefit to water resources management.

3 Feasibility assessment summary

A detailed feasibility assessment is provided in the technical appendices supporting this proposal. The feasibility assessment is summarised here in a constraints and options assessment that highlights whether any constraints have been identified and the requirement for mitigation of these constraints (Table 2). No constraints were identified at the proposed mitigation option deployment location.

Table 2: Constraints and options assessment summarising the feasibility assessment outcomes and any mitigation requirements.

Feasibility criteria	Constraints identified	Mitigations required
Topography and levels	None	N/A
Geology and hydrogeology	None	N/A
Soil and sediment	Earthworks may mobilise sediment that is transported downstream.	Conduct works following a dry period; Deploy silt trapping techniques such as silt fences and silt mats to trap mobilised sediment.
Flood risk	None	N/A
Protected site, species and INNS	None	N/A
Land use	None	N/A
Ownership	None	N/A
Rights of way and public access	None	N/A
Bird strike risk	A small airfield is located ~1 km from Bliby_wood_DD1 & DD2. The size of the airfield combined with the limited additional bird populations likely to be attracted to the ditches means bird strike risks are minor.	The airfield has been contacted to discuss the issue further and determine if any mitigations are required.
Nature recovery	None	N/A
Unexploded ordinance	None	N/A
Services and infrastructure	None	N/A
Regulatory considerations	Consents will be required from:	The IDB and EA have been engaged and the

Feasibility criteria	Constraints identified	Mitigations required
	• Lead Local Flood Authority (LLFA) • IDB • Environment Agency (EA) The specific consents required depend on the site.	consenting process is underway. Where Ordinary Watercourse Consents are required, these will be applied for from the LLFA.

4 Implementation plan

The implementation plan detailed below details the approach to deployment of the proposed nutrient mitigation scheme. This plan captures various stipulations detailed in the technical proposal detailed above and in the supporting technical appendices to this document.

The various steps and actions required as part of the implementation plan are detailed in the sections below. Where actions detailed in the implementation plan are required over the lifetime of the scheme, this is assumed to be a period of 80 years from when delivery of the scheme is secured through a legal agreement. This reflects the *in perpetuity* requirement for mitigation schemes for nutrient neutrality.

4.1 Site clearance and earthworks

Deployment of proposed mitigation scheme will require the clearance of vegetation in areas for deployment of the buffer strips adjacent to the watercourse in order to prepare this area of grass and tree planting. Excavation to form the new two-stage channel cross-section will require earthworks and spoil removal. Considerations of the potential environmental impact of earthworks and required mitigations are provided in the detailed feasibility assessment (see technical appendices to this proposal) and are summarised in Table 2.

Table 3: Actions and a timeline for site clearance and earthworks for the deployment of the proposed mitigation scheme.

Actions	Description	Timeline
Plan work for period of dry weather	Works will be conducted after a period of dry weather to reduce the risk of sediment mobilisation and to ease groundworks. This will also reduce the risk soil compaction.	Spring 2026
Vegetation clearance	Where necessary, vegetation will be cleared in a 10 m buffer strip next to each ditch to prepare ground for grass seeding and tree planting. Following the recommendations in the Preliminary Ecological Appraisals for each site, vegetation clearance works will be preceded by a check for invasive non-native species (INNS) and where INNS are located, specialist advice on appropriate control and eradication measures should be sought before undertaking any work that could cause their spread. All sites are currently undergoing a suite of additional ecology surveys during Summer 2025. These will include a further check for INNS during the vegetation growing season. The sites will also be checked prior to commencement of earthworks.	Winter 2026
Ground preparation	If required, ground in the buffer strip area will be made level enough to allow planting, however care will be taken to maintain varied topography within the buffer zone so as to reduce the risk of sheet flow during the period of vegetation	Winter 2026

	establishment. This may require removal of any sediment that has been dredged from the ditches and placed next to them.	
Excavation	Drainage ditches will be excavated to create the channel dimensions detailed in the technical appendices. Where soil compaction occurs during excavation, tilling will be used to break up compacted soils and tilled areas will be seeded to ensure vegetation establishes quickly and reduces the risk of soil erosion.	Spring 2026
Spoil handling and disposal	Where excavation is deep enough to reach subsoil, topsoil and subsoil will be handled separately. Topsoil will be reused within the mitigation scheme as much as possible, to provide soil conditions that will be most conducive to vegetation establishment. Remaining topsoil and subsoil will then be disposed of within the watershed of the watercourse to ensure that any mobilised soil due to scheme deployment should be retained within the mitigation scheme.	Spring 2026

4.2 Vegetation establishment and management

Planting of vegetation in the ditches and buffer strips will be timed to minimise the risk of vegetation failing to establish. Table 4 details a plan for vegetation establishment and management for the proposed mitigation scheme.

Table 4: Actions and a timeline for vegetation establishment and management.

Actions	Description	Timeline
Floodplain bench grass seeding	Grass seed will be planted on the newly formed floodplain benches within the ditches.	Spring 2026
Buffer strip grass planting	The grass zones for each buffer strip will be seeded with a mix of seeds comprising predominantly perennial grass species with some annual species within the seed mix.	Spring 2026
Buffer strip tree planting	Tree zones within each buffer will be planted with native tree and shrub species. Planting will take place between November and March.	Jan 2026-Mar 2026
Vegetation establishment	Following grass seeding, inspections will be carried out in late summer and remedial action taken where vegetation is failing to establish. Following tree planting, inspections will be carried out either during the following spring (between April and June) if trees are planted before February, or three months after planting if trees are planted in February or March. Remedial action will be taken where trees are failing to establish.	Jul-Aug 2026

Actions	Description	Timeline
Long-term grass management	Grasses within buffer strip grass zones and within ditches will be left to grow until they reach a height of around 0.5 m. Once this sward height has been reached, grass will be cut at the end of summer to remove nutrients from the buffers and ditches. The arisings from mowing will be removed for composting.	Beginning from the first year in which grasses reach a height of 0.5 m
Long-term tree management	Trees within buffer strips will be coppiced at five-year intervals. Woody biomass removed from the buffers will be composted or sold for alternative uses, such as use as fuel wood or in basket making.	Every five years starting between Feb to Mar 2031
INNS management	If monitoring identified INNS, control and eradications measures will be implemented, supervised by a suitably qualified specialist.	Following the monitoring intervals specified in Table 6 below.

4.3 Outline management plan

Table 5 details the key management and maintenance action that form the outline management plan. The frequency of the required management and maintenance works will be determined through monitoring, based on the monitoring plan detailed below. Where monitoring highlights the requirement for remedial actions, these actions will be taken during the summer and early autumn period prior to onset of wetter conditions in late autumn. As part of the lease agreement for the land being used to deploy the scheme at each deployment location, the landowners are taking on responsibility for the day-to-day monitoring and management of the scheme. Greenshank Environmental will remain engaged on the scheme as an expert advisor to the landowners to ensure the monitoring and management plan is delivered.

Table 5: Management and maintenance actions required to provide confidence that the proposed scheme will continue to provide mitigation.

Actions	Description	Timeline
Rectify damage to the two-stage channel cross-section	If the two-stage channel cross-section has been damaged by erosion, stabilisation of eroded areas will first be attempted by replanting vegetation at increased densities. If erosion is found in subsequent monitoring, natural materials such as coir matting will be installed to stabilise eroding areas.	Beginning from June 2026 with works conducted during Spring 2026.
Removal of excess sediment accumulation	Where the two-stage ditch cross-section is being impacted by sediment deposition, sediments will be removed from the ditch and spread within the ditch catchment. Where sediment removal impacts vegetation, remedial actions will be taken to replace vegetation.	

Actions	Description	Timeline
Repair damage to low-grade weirs	Where low-grade weirs are damaged, they will be repaired and where necessary, replaced.	
Repair damage to fencing	Any damage to fencing should be repaired so that livestock or other grazing animals cannot access the buffer strip and watercourse.	

5 Post-implementation monitoring plan

5.1 Monitoring to support adaptive management

The following monitoring actions (Table 6) will be used to inform adaptive management of the mitigation scheme. Due to the dynamic nature of the proposed mitigation scheme, management and maintenance requirements will not be fixed over the scheme's *in perpetuity* period. Adaptive management led by monitoring will allow management and maintenance actions to be taken in response to degradation of the scheme that may compromise its nutrient mitigation function.

Table 6: Monitoring actions that will be used to facilitate an adaptive management regime for the proposed mitigation scheme.

Actions	Description	Timeline
Vegetation monitoring	All vegetation within the buffer and drainage ditch mitigation options will be monitored as follows: • Visual inspections to determine the health of vegetation. • Fixed-point photography will be used to record the continued presence and growth of vegetation at each mitigation option location. Monitoring data will be collated into monitoring reports for submission to the Competent Authority. Where problems related to vegetation establishment are found, this will trigger remedial actions to maintain vegetation health or replacement of vegetation where required. Vegetation monitoring will be carried out in June of each year at the following frequencies over the 80-year in perpetuity period: • Annually for the first five years of the 80-year period. • Every five years up to year 15 of the 80-year period. • Every ten years thereafter up to the 80-year period.	Beginning from June 2027

	If monitoring identifies problems with vegetation establishment resulting in management actions, the annual monitoring and reporting will be conducted until vegetation is well established at the site and not requiring regular management. Each monitoring event will include a check for the presence of INNS and where presence of INNS is observed, specialist advice on control and eradication will be sought.	
Drainage ditch monitoring	Each drainage ditch will receive an annual visual inspection at the end of spring to check whether the two-stage ditch cross-section and the low-grade weirs in each ditch have been maintained following winter high flows. Fixed-point photography will be used to monitor changes to the morphology of the ditches and the presence of weirs. For ditches located within Flood Zone 3, the ditches will be inspected following any flow events that exceed a 1-in-2 year return period, as specified in the hydrology report for each site commissioned as part of the detailed design process[4]. A monitoring procedure will be detailed for each site whereby the most appropriate EA river flow gauge will be checked[5] following larger rainfall events. The gauged flow data will be scaled based on catchment size in order to derive an estimated gauged flow for each drainage ditch catchment, which can be referenced against the 1-in-2 year return period flow for the site to determine whether a site inspection will be required. It is recognised that river flow does not always scale perfectly linearly with catchment size, so an element of precaution will be included in scaling of flow data, so as to reduce the risk of not inspecting a site which has experienced a high flow event. Beaver are starting to recolonise parts of the Stour catchment. The impacts of beaver colonisation on any of the mitigation options could be positive or negative. Should beaver begin to colonise any of the mitigation option deployment locations, their activities will be monitored if required, protected species licences will be obtained so that they can be removed. A monitoring sheet and data recording system will be established to record changes in condition of the ditches, including areas of excess erosion or sediment deposition that may start to impact the nutrient reduction function of the ditches. Where problems requiring remedial actions are identified through monitoring, the relevant management actions detailed in Table 5 will be carried out. Monitoring data and any remedial actions resulting from monitoring will be collated into monitoring reports for submission to the Competent Authority. Monitoring of drainage ditches will be conducted at the same frequencies as detailed above for vegetation monitoring.	Beginning from June 2027

[4] CBEC. 2025. Stodmarsh Stream Enhancement Scheme, Final Hydrology Report.

[5] Using data made available on the EA Hydrology Data Explorer, available from: https://environment.data.gov.uk/hydrology/landing, accessed on: 01/07/2025

6 Summary

An N and P mitigation scheme has been proposed for deployment at seven sites within the River Stour catchment that drains to the Stodmarsh Habitats Sits. Mitigation from this scheme is intended for offsetting the additional nutrient pollution generated by new residential development. The Stodmarsh Habitats Sites are failing the N and P targets required for the sites attain Favourable conservation status and thus additional N and P pollution risks adverse effects on site integrity. This delivery proposal details a novel approach to the management of small, heavily managed watercourses to generate N and P mitigation.

The concept for the scheme is based on the source-pathway-receptor model of pollution transport. By intercepting N transport pathways that transfer N and P predominantly from diffuse agricultural sources, the specific watercourse management approach detailed in this proposal will promote N and P cycling processes to reduce the downstream transport of N and P to receiving environments.

To determine the mitigation potential of the scheme, the catchment draining to the deployment location was delineated. The land use, soil drainage characteristics and rainfall were determined for the catchment and used to select groundwater-corrected N and P export coefficients that describe the per hectare loss of N and P from different land uses in the catchment. These export coefficients were then used calculate the baseline nutrient load input to the scheme, which was reduced by a precautionary reduction efficiency for this type of intervention. **Using this approach, the seven sites comprising the Stodmarsh Stream Enhancement scheme have a precautionary mitigation potential of 6426.55 kg TN/year and 303.73 kg TP/year.**

In order to achieve this mitigation potential, the scheme was designed according to the design criteria detailed in (Connor-Streich, 2024a). The watercourse was redesigned to incorporate a two-stage cross-section, vegetated floodplain benches and 'low-grade weirs' in the form of large woody debris installations. This design will increase contact time of flow with sediment and vegetation, promoting natural processes that cycle N and P. The proposed design will also have number of additional benefits including NFM and biodiversity improvements.

A detailed feasibility assessment was conducted for the scheme and is provided in a supporting technical appendix, along with full details of the methodology used to quantify the mitigation potential of the scheme and detailing the scheme design. The feasibility assessment is summarised here and shows a lack of any significant barriers to scheme deployment.

The technical details of the scheme are supported by an implementation plan that details the sequence of deployment works required to deliver the mitigation option. This plan outlines the timing of site clearance and earthworks, which are planned for Winter and Spring 2026. Following reengineering of the ditch, vegetation will establish on the floodplain benches and the riparian zone, according to the planting plan detailed in the technical appendices. An outline management plan was formulated and will be enacted in response to damage or changes, such as excessive sediment accumulation, that may impact the nutrient reduction processes active within the reengineered watercourse. Management and maintenance actions will be triggered through an adaptive management regime that uses monitoring to highlight the need for scheme maintenance.

7 References

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