



Wetland Implementation Flood Risk Assessment

Hepple Estate

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Document Control

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Field Investigations and Data

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1. Summary

EcoNorth Ltd was commissioned by Hepple Estate to undertake a Hydrological Restoration Plan at the Hepple Estate, Coquetdale, Northumberland. The plan is required to comprise of 2 elements; a scoping and prioritisation exercise followed by the development of implementation plans for selected areas to be taken forward. This document comprises the implementation plan for elements of the strategy which require planning permission due to the nature of the works.

A desk study completed alongside the field visit highlighted the presence of 3 statutory sites within 2km of the site boundary. All wetland creation areas identified are located outside the designated sites, however, all the sites are hydrologically connected to the River Coquet SSSI.

A range of measures for wetland creation were identified within a scoping report for the estate prepared in March 2024. The measures which were identified that require planning permission are identified within this report and the accompanying plan, design, and access statement.

Measures proposed include:

- Creation of standing open water in the form of ponds
- Intervening with existing drainage channels to ensure a good water supply to newly created ponds and to slow the flow of water off the land by diverting it into new ponds
- A series of scrape features - some located in close proximity to proposed ponds and some on additional components of the estate

The wetland features are targeted towards creating wetland habitat features beneficial to breeding waders, amphibians and aquatic invertebrates, features may also be suitable for water vole should populations recover within the River Coquet catchment.

All proposed measures were discussed on-site with Environment Agency personnel on the 23rd February 2024.

The measures identified will support Natural Flood Management (NFM) principles and slow historic artificial drainage, though no hydrological modelling is available to show any effect of this.



2. Introduction

2.1 Background

EcoNorth Ltd was commissioned by Hepple Estate to undertake a Hydrological Restoration Plan at the Hepple Estate, Coquetdale, Northumberland. The plan is required to comprise of 2 elements; a scoping and prioritisation exercise followed by the development of implementation plans for selected areas to be taken forward. This document comprises the implementation plan for elements of the strategy which require planning permission due to the nature of the works.

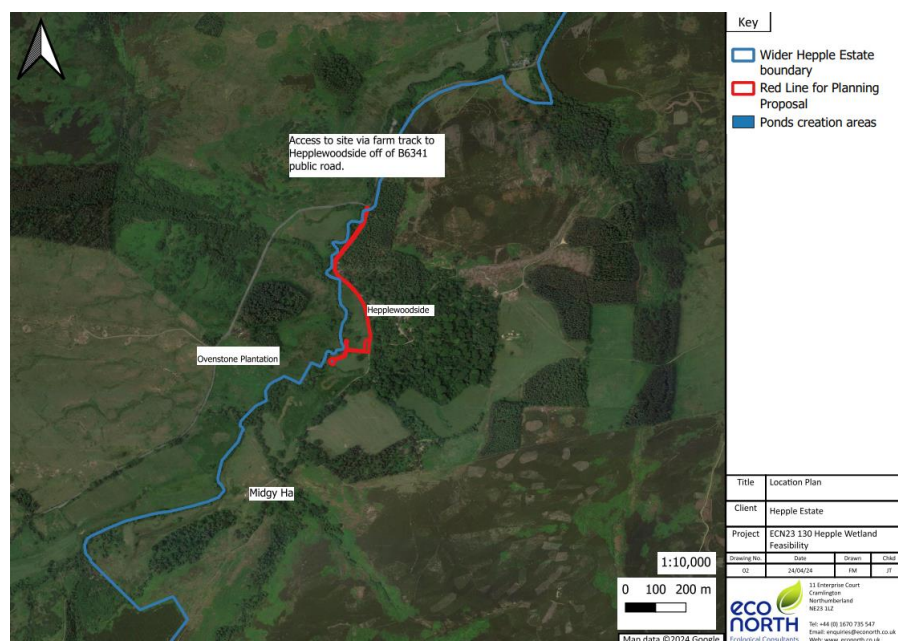
This report:

- Presents the nature of proposed habitat creation works.
- Sets out the location of the proposed works in relation to Flood Risk Zones
- Provides an assessment of the risk of flooding / potential benefits to flood risk to relevant receptors

2.2 Site Context

Figure 1 identifies the indicative location and boundary of the site.

Figure 1: Indicative Site Boundary (Boundary outlined in red)





2.3 Summary of the Proposals

It is proposed to create a series of 2 ponds to create and enhance wetland habitat within the floodplain of the Grasslees Burn. The ponds have been designed to be located in non-priority habitats and avoid other ecological and environmental sensitivities.

Figures 2 and 3 illustrate indicative cross sections of proposed ponds 1 and 2.

The scheme comprises of 2 pond features, the locations and dimensions of these ponds are set out in Table 1 below. Arisings from the pond excavations will be moved to a more elevated location and deposited alongside the existing estate access track. The ponds will comprise uneven edges and variable depths / slope gradients into the features to increase their structural heterogeneity and increase value for wildlife. The maximum length, width and depth parameters which will be applied are set out below.

Table 1: Pond Locations and dimensions

Pond Reference	Max Length (M)	Max width (M)	Max depth (M)	
Pond 1	22	17	1.5	Pond will be fed by existing artificial drainage channel located immediately to the south of the feature.
Pond 2	30	7	1.0	Pond will naturally be fed by seepages running downslope towards the Grasslees Burn.

Commented [TW1]: The drawings show marginal vegetation. Can we clarify these will not be planted up to avoid introduction of invasives and that marginal amphibious/aquatic plant species will be allowed to establish naturally?

A number of considerations have been factored into the design phase of the works to ensure that the proposals avoid any adverse environmental / ecological effects, and which aim to maximise biodiversity benefit.

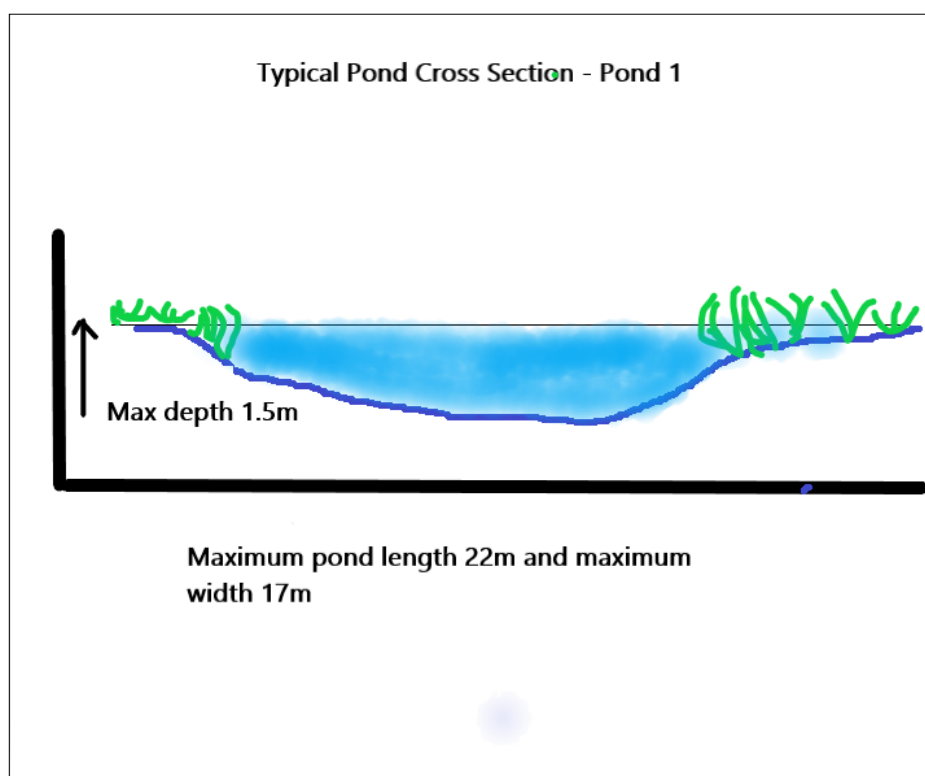
Design will follow these principles to maximise benefits to wildlife:

- All pond sides will be shallow slopes, ranging between 1:5 and 1:20 (3°). This will help create wide draw down zones within which water levels fluctuate seasonally.
- Where practicable ponds will include wide marginal zones consisting of shallows and mid depth zones will be created as including a range of depth zones will maximise benefit to a range of aquatic species.
- The deepest part of the ponds will be up to 1.5m deep (Pond 1) and 1m deep (Pond 2). Where possible, undulations will be created in the deeper areas to provide bars to benefit aquatic plants.
- Small scrapes and depressions (which we are advised by the Planning Department as not needing planning permission) will also be created in the locality to further increase the diversity of wetland



features creating a more extensive complex of wetland habitat types. This will help to create a complex of water retaining features, many of which will dry out in the summer. Temporary pools are highly valuable to wildlife and will complement the permanent water of the main ponds which are intended to hold water year round.

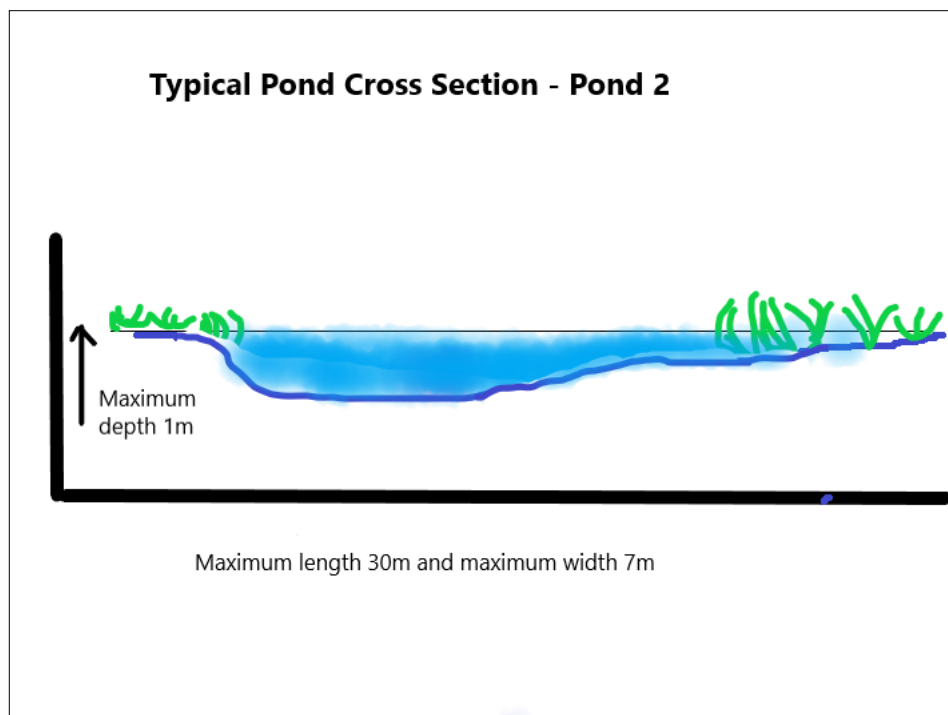
Figure 2: Pond Profile – Pond 1



Pond 1 illustrated above comprises a broadly rounded shaped pond with the edges and overall shoreline varied to increase the amount of high value ecological niches such as shoreline habitat available. The pond slopes will include a range of gradients and will ensure that extensive shallow and mid depth areas are available as well as reaching more significant depth to ensure pond permanence. Some edges will comprise slopes as steep as 1:5 while other areas will include a gentler gradient with an average gradient of 1:10 expected throughout the pond feature. Ponds will be allowed to colonise naturally and no planting will be brought from offsite.



Figure 3 – Pond Profile Pond 2



Pond 2 comprises a longer and narrower profile pond. As a result it is anticipated that to achieve the relevant shallow profiles and extent of shoreline required that a shallow gradient slope will only be possible on a single side and will be in the region of 1:6 – 1:8. On the opposing side the slope will need to be steeper to fit a pool in which reaches depths of up to 1m and will likely be at a slope of 1:2. The end slopes at the north and south ends of the pool will comprise much shallower gradients of 1:10 or more.

2.4 Earthworks volumes

An estimated 521m³ of arisings from pond creation will be removed from the pond locations. All material will be removed from below the 110m contour in Flood Zone 3 and moved to elevated ground between the 110m and 120m (closer to 120m) at the level of the estate track. The overall effect will comprise the removal of material out of the flood plain creating additional space for water (assuming that the ponds are not permanently at capacity). This concept aligns with the Natural Flood management principals which have driven the proposals.

No new materials will be introduced to Flood Zone 1 or 2 either on a temporary or permanent basis as a result of the proposals.



2.5 Flood Risk Location

The approximate layout of the proposed ponds – temporary working / access routes and areas to relocate arisings from pond excavation are included in Figure 4 below. The location of Pond 1 is located within Flood Zone 3. Similarly, parts of the overall footprint of Pond 2 are located in Flood Zone 3. Figure 5 shows the site’s location in relation to the flood risk zones. All proposed pond areas lie below the 110m contour.

Areas identified for pond arisings identified on Figure 4 below are located in Flood Zone 1 and are located up a notable slope adjacent to the estate track level which is located close to the 120m contour elevated outside of the floodplain of the Grasslees Valley.

Figure 4 – Site Layout

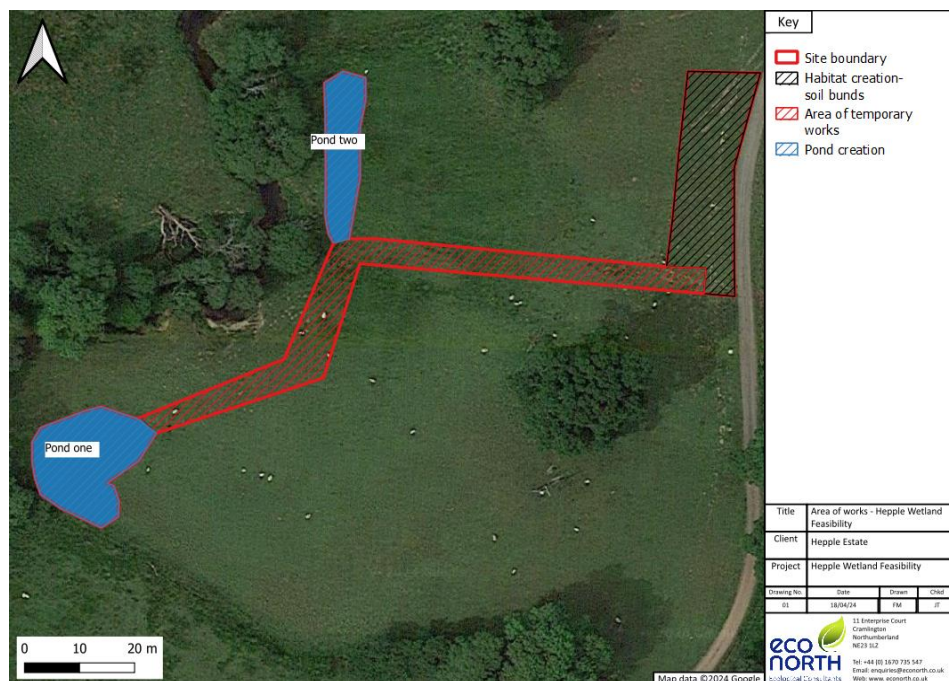
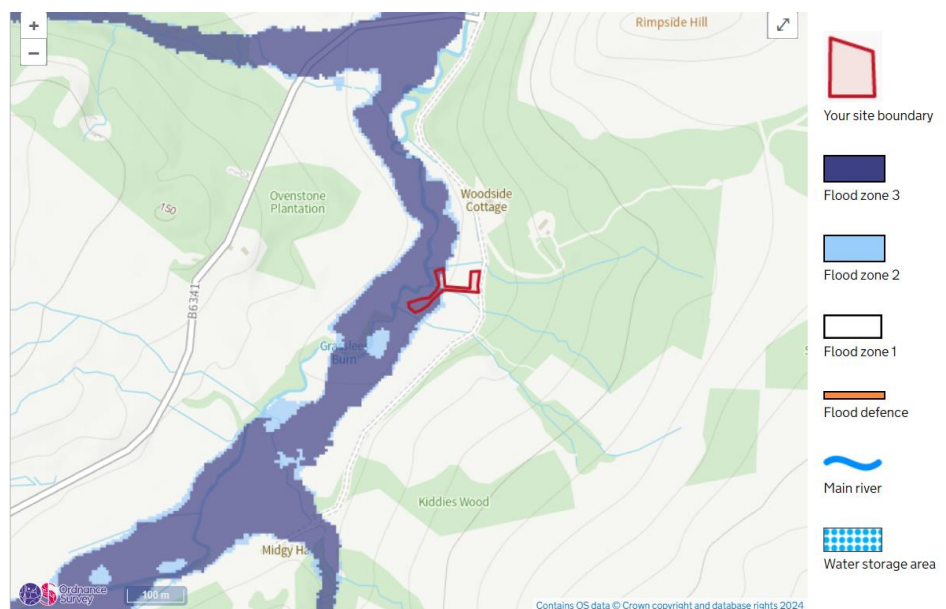




Figure 5 – Flood Risk Zones



2.6 Flood Risk Receptors

The closest residential receptor to the works is located c 130m NE of the location of Pond 2. This comprises woodside Cottage which is located close to the 120m contour whereas the proposed ponds are located below the 110m contour. Upstream Midgy Ha within the Hepple estate is located c.500m south of the proposed pond locations. A further residential property is located c.300m to the west on the 130m contour. No other properties or flood risk receptors are identified within 1km of the proposed pond locations.

2.7 Flood Risk Assessment

The pond features associated with the proposal are located within EA Flood Risk Zone 3 and therefore on a simplistic level the proposals require a flood risk assessment. The proposals however are comprised of wetland creation and the following considerations are taken into account within this assessment.

- The proposals comprise a net reduction in materials within the floodplain as such there will be no net loss of flood capacity. No new materials or structures will be introduced as part of the works.
- The proposals form part of a suite of measures aimed at creating wetland habitat and have the principles of natural flood management NFM and slowing the flow of water of the land engrained within them.
- Given the location of receptors and nature of the proposed works there are no direct pathways for elevating flood risk.



The hierarchy for flood risk assessment requires that consideration is given to alternative locations for development using the 'sequential test' described on the gov.uk website <https://www.gov.uk/guidance/flood-risk-and-coastal-change#the-exception-test>.

In the case of the proposed pond locations, they have been selected to lie within the land ownership boundary outside of priority habitats as well as avoiding other sensitive ecological receptors and have been identified where the existing land forms (current flat topography) will be suitable for pond creation that will function and retain water. On this basis given the nature of the proposals any other suitable sites would likely be within the same flood zones and so other alternatives have been considered as far as possible.

Where projects can not be planned outside of the relevant flood zones the 'exception test' may be considered. The relevant text relating to the exception test from the gov.uk website is included below.

The Exception Test requires two additional elements to be satisfied (as set out in paragraph 164 of the National Planning Policy Framework) before allowing development to be allocated or permitted in situations where suitable sites at lower risk of flooding are not available following application of the sequential test.

It should be demonstrated that:

- *development that has to be in a flood risk area will provide wider [sustainability benefits to the community that outweigh flood risk](#); and*
- *the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.*

In relation to the first test, the overall aims of the wetland creation documented in this report are aligned with wider sustainability objectives of 'biodiversity' and flood resilience through natural flood management measures and for the purposes of this assessment it is considered that the creation of wetland habitats meet this test.

In relation to the second test, while no measurable effects can be reported without modelling, the creation of pond excavations within the flood plain may result in an overall net positive effect on flood risk – reducing risk overall, this takes into account that no temporary or permanent material deposits will be retained within Flood Zone 3 as part of the project and all arisings will be distributed within Flood Zone 1. Similarly, the ponds will intercept currently straight line channels which convey water directly to the Grasslees Burn into the pond effectively slowing the flow of water in this location off the land. End users of the development will relate to temporary visitors to the location who will not be exposed to any risk as a result of the proposals. Given the nature and aim of the proposals it is considered that the proposed pond creation work pass this test.



2.8 Mitigation and controls

As described above, the works are not expected to result in any increase in flood risk to any relevant receptors. A series of general controls are however presented within the environmental assessment report and those which are related to the protection of the aquatic environment are included below for reference.

- Any chemicals, including empty containers, will be stored in appropriate locked containers when not in use. These containers will be located at least 30m from any detectable hydrological pathway.
- Spill kits will be kept on site at all times and made available to all individuals present. Contractors will ensure that staff trained in the use of the kits are on site at all times during works.
- Works will be planned to minimise potential release of sediment into adjacent watercourses, suitable controls such as straw bales and silt fencing will be retained for use on site if required. Works will be phased to minimise the risk of sediment release into adjacent watercourses.