



# ANNEX B3.1.6

Environmental  
Assessment: Minworth  
and SLR  
BNG & Natural Capital

# Environmental Assessment for the Trent Strategic Resource Options (SRO)

Minworth SRO and South Lincolnshire Reservoir (SLR)  
SRO

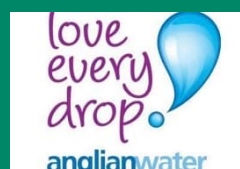
## **Appendix F: Non-Water Resources Benefits - Natural Capital and Biodiversity Net Gain Assessment**

Affinity Water, Anglian Water Services Ltd and Severn  
Trent Water Ltd

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# 1. Introduction

## 1.1 Background

- 1.1.1 AECOM previously completed the Hydrology, Environment and Ecological (HEE) gap analysis of the River Tame, River Trent and Humber (TTH) system for Gate 1, carried out jointly for Minworth and the South Lincolnshire Reservoir (SLR). Subsequent investigations completed for Gate 2 include baseline Aquatic Ecological Monitoring (May2022), water quality monitoring in the River Tame (June 2022), and Hydrological, Aquator and Hydraulic Modelling of the rivers Tame and Trent (June 2022). The latter is running parallel with these assessments and provides modelling outputs to inform the assessment of potential environmental impacts.
- 1.1.2 The HEE baseline study for the Tame, Trent and Humber in support of the Minworth and SLR for Gate 1 encompassed 19 in-depth topic reports and an overall summary report to inform further environmental assessment for the Minworth and SLR Strategic Resource Options (SRO).
- 1.1.3 The Gate 1 work involved considering Water Framework Directive (WFD) related impacts and benefits, baseline ecological data, and in particular the potential impacts of changes in flow to ecological receptors such as designated sites and their qualifying features, protected and notable species, and particular constraints from the presence or future spread of Invasive Non-Native Species. Also assessed were Navigation, Sedimentation, Assets along the Trent, Abstraction and Discharge Licences, Saline Intrusion, fish habitats and migration, Biodiversity Net Gain, Natural and Social Capital, and Soil and Humidity. Some of these topics have been carried forward for further detailed assessment at Gate 2, as presented here and in the overall Environmental Assessment report, to which this report forms an appendix.
- 1.1.4 This report presents the assessment of non-water resources benefits, which are assessed through six Capitals (natural, social, human, intellectual, manufactured, and financial) and Biodiversity Net Gain (BNG) assessment.

## 1.2 Assessment Rationale

- 1.2.1 This report details the assessment of the six Capitals and Biodiversity Net Gain, including any links and interdependencies with other topics, any gaps, or limitations to the assessment (e.g., the availability of supporting information, which would have been established and flagged at an early stage), and any recommendations for further work required to incorporate into further assessment for Gate 3. This will inform the next stage of environmental assessment of the Trent SROs in support of the two related SRO schemes:
  - Minworth; and
  - South Lincolnshire Reservoir (SLR).
- 1.2.2 The Services to be delivered are for Affinity Water, Anglian Water Services Limited and Severn Trent Water Limited.
- 1.2.3 The purpose of the Gate 2 assessment is to assess the impact of the reduction of discharge to the River Tame and Trent system, where Minworth currently discharges a Dry Weather Flow (DWF) of 417 MI/d (as per Concept Design Report CDR, Jacobs 2022), separately and in-combination with the potential abstraction of up to 300 MI/d (as an absolute maximum) for the SLR SRO. This assessment is critical to supporting concept design and scheme environmental assessment for key SROs at Gate 2.
- 1.2.4 A key element of the related SROs, Minworth and SLR, is to investigate the environmental risks and opportunities associated with delivery of the schemes.

## 1.3 Objectives

- 1.3.1 The key objectives of the Gate 2 Environmental Assessments are as follows:
- Build on the work completed in Gate 1 to provide a robust impact assessment of the discharge reduction from Minworth in to the TTH system and surrounding environment and assess the impact the proposed transfers could have on Natural Capital and Biodiversity Net Gain.
  - Build on the work completed in Gate 1 to provide a robust impact assessment of the abstraction of up to 300Ml/d for the SLR, to the Trent, Tame, Humber (TTH) system and surrounding environment, and assess the impact the proposed transfer could have on Natural Capital and Biodiversity Net Gain.
  - Define what mitigation measures need to be implemented to satisfy regulators that the SROs are viable. Any mitigation measures that require engineering solutions such as modification to fish passes or weirs, should be fed back into the Engineering workstream.
  - Support engagement with key stakeholders including the Environment Agency, Natural England (NE), Canal and River Trust, Water Resources East, and the River Trent Working Group. This has taken the form of monthly workshops to present findings and/or discuss key themes, risks, or mitigations, and site visits to inform the assessment of specific features.
  - Produce an environmental scoping checklist (Section 4) to ensure identification of the likely significant environmental effects of the proposed projects and ensure all assessments and data collection are completed to support further environmental assessment at Gate 3.
- 1.3.2 This report sets out the preliminary findings of field surveys, monitoring, and desk-based environmental assessments; to drive engagement with relevant regulators and other decision-makers; to agree the survey specifications and locations for any data collection or studies.
- 1.3.3 This report covers the key theme of non-water resources benefits (Biodiversity Net Gain and six Capitals).

## 1.4 Environmental Assessment

- 1.4.1 The outcome of the environmental assessments supports an assessment of the potential impact and changes to the environment and ecology within the River Tame and Trent and associated water bodies and habitats as a result of activity associated with the SROs. This technical appendix and other supporting reports detail the assessment and demonstrate a clear line of sight to further assessment, identifying potential significant effects, and informing the scope for future detailed assessments as set out in the Strategic regional water resource solutions guidance for gate two (RAPID, April 2022<sup>1</sup>), including:
- Water Framework Directive (WFD) Compliance Assessment;
  - Informal Habitats Regulations Assessment (HRA);
  - Environmental Appraisal (including Strategic Environmental Assessment (SEA)); and
  - Other Environmental Considerations including Biodiversity Net Gain (BNG) and Natural Capital Assessment (NCA).
- 1.4.2 The results of the environmental assessments are collated into the single overall report, supported by technical appendices, informed by regular liaison with the project teams and stakeholder engagement, for incorporation into the Gate 2 submission. This includes the results and recommendations from each topic within the environmental assessment.
- 1.4.3 The overall approach to the assessment and monitoring specification includes, but is not limited to, the extent of designated sites and Priority Habitats for ground truthing and walkover surveys, the extent of

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<sup>1</sup> Regulators' Alliance for Progressing Infrastructure Development (RAPID) (April 2022). Strategic regional water resource solutions guidance for gate two.

fluvial walkover surveys, and the range of data and supporting information required to support the assessment.

- 1.4.4 This technical appendix supports the overall environmental assessment report, the focus of which is as follows:
- i. Results and recommendations of the topic assessment;
  - ii. A detailed assessment of the potential impacts and changes to the environment and ecology within the Rivers Tame and Trent, and associated water bodies, habitats, and species, as a result of activities associated with the SROs;
  - iii. The overall environmental assessment report and technical appendices will support subsequent assessment for RAPID Gate 2;
  - iv. Ensure a clear line of sight toward future environmental assessments and any additional planning requirements, e.g., HRA, SEA, WFD compliance assessment, etc. This will include identifying receptors to potential impacts, the likely extent, scale, and significance of impacts according to industry standards, and preliminary recommendations for appropriate mitigation;
  - v. A key component of the final report will be an environmental scoping checklist to identify and grade likely significant environmental effects, to form the basis of and inform future environmental assessment at Gate 3;
  - vi. Clear identification of any gaps and limitations in the assessment, which would have been identified and discussed with the Clients and stakeholders at an early stage.

## 1.5 Assessment Scenarios

- 1.5.1 Assessment of different scenarios for operation of the SRO schemes will be undertaken. This is based on the likely seasonal operation and operational regime requirements for the Minworth transfers and SLR abstraction, as described in detail in the overall assessment report (60669746\_REP\_003\_Env-Ass\_Trent\_SRO\_V5<sup>2</sup>, Annex B3.1), and briefly summarised as follows:

### Minworth SRO

- 1.5.2 The Minworth SRO supports two options for transfer of final effluent, resulting in corresponding reductions in the discharge of effluent to the River Tame. These are transfer to the Grand Union Canal (GUC) SRO, and transfer to the River Avon for the Severn to Thames Transfer (STT) SRO. This is currently divided into the following volume options:
- 57 MI/d (Megalitres per day) discharge to GUC SRO;
  - 115 MI/d discharge to GUC SRO;
  - 57 MI/d discharge to River Avon for STT SRO;
  - 115 MI/d discharge to River Avon for STT SRO; or
  - Combined 230 MI/d transfer to both River Avon and GUC (115 MI/d to each).
- 1.5.3 Therefore, the current approximately 417 MI/d (DWF) discharge of final treated effluent from Minworth will reduce by a maximum of 230 MI/d.

### SLR SRO

- 1.5.4 The SLR SRO includes an option for abstraction from the River Trent to the River Witham, supported by further abstraction from the River Witham downstream. The Trent transfer has a maximum capacity of 300 MI/d, with abstraction subjected to the Hands-off Flow (HoF) on the River Trent – when the HoF

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<sup>2</sup> AECOM (April 2022). Environmental Assessment for the Trent Strategic Resource Options (SRO): Minworth SRO and South Lincolnshire Reservoir (SLR) SRO. Results and Recommendations.

level is reached, abstraction will cease. The Trent transfer will support the SLR when there is insufficient flow in the River Witham.

## 2. Scope and Approach

### 2.1 Introduction

- 2.1.1 This section sets out the approach to Environmental Assessment of the Minworth and SLR SRO schemes, informed by RAPID guidance for Gate 2 and on-going stakeholder engagement.

### 2.2 Projects and Work Completed to Date

- 2.2.1 Key findings and recommendations from the Tame, Trent and Humber baseline assessment for Gate 1 included:
- Identification of ecologically sensitive designated sites, Priority Habitats, protected/notable species, hydro-geomorphological features, WFD statuses.
  - Recommendations to complete and maintain the baseline assessment, inform subsequent impact assessment, and data refresh.
  - AECOM is now undertaking follow-on work to inform Gate 2, including macroinvertebrate, macrophyte, River Habitat Surveys (RHS), Invasive Non-Native Species (INNS) surveys, Water Quality monitoring, and Hydrological, Aquator and Hydraulic Modelling of the rivers Tame and Trent.
- 2.2.2 The literature search involved contacting statutory and local bodies, scientific literature databases, with data sources listed.
- 2.2.3 Reports set out the literature review and baseline information for each topic, including data gaps/recommendations, links to the consistent methodology (including SEA framework) currently being developed for the environmental assessment of SROs. This helped to demonstrate to regulators and stakeholders that the evidence effectively informed the strategic assessments.
- 2.2.4 These reports critically evaluated the information gathered and identified gaps in knowledge, reviewed areas of uncertainty or conflicting opinion, and formed the basis for further environmental investigation and impact assessment, including recommendations for the next stages (Gate 2) of the assessment process.

### 2.3 Scope of Environmental Assessment

- 2.3.1 Critical to the assessment is the requirement to liaise with stakeholders and decision makers to agree the monitoring specification and purpose for discussion with the Regulators. This will be an on-going and iterative process through on-going engagement, and consideration of each stage of the assessment as it progresses.
- 2.3.2 Through the assessments for the Tame, Trent and Humber baseline study, it was noted that constraints and limitations may be encountered, for example due to the availability and completeness of available data, and therefore it has been critical to engage stakeholders at each stage to resolve potential issues, and tailor the assessment methodology to maximise the benefits of available data and information. This is critical to ensure the success of the assessment through Gate 2.
- 2.3.3 The outcomes of the Gate 1 baseline assessment and outputs of parallel monitoring and modelling work also underway have been used to support the large-scale environmental assessment.

### 2.4 Non-Water Resources Impacts and Benefits

#### Objectives

- 2.4.1 The objectives of the Natural Capital and BNG assessment, as set out by the Client, are as follows:
- *Whilst carrying out these assessments, identify opportunities for the SROs to create benefits to the environment and socio-economically.*



- *Liaise with catchment partnerships such as Trent Rivers Trust, to investigate opportunities to deliver net gain at the landscape scale. A number of Biodiversity Opportunity Maps may have also been produced and would provide vital information and would complement this approach.*
- *We will develop an understanding of biodiversity impacts of the SRO proposals in order to understand the net gain requirements. This means understanding impacts on non-designated sites. We will present ecological habitat survey reports in UKHab language.*
- *Discussions with Natural England and the inclusion in relevant guidance (e.g., 25-year plan) show SROs would be expected to have no net negative impact as a minimum and would be expected to have a net positive impact where practically possible.*

## Proposed Assessment Methodology

### Natural Capital Assessment

- 2.4.2 For the Gate 1 baseline study, studies which sought to define the socio-economic benefits from habitats and species associated with the main river system of the Trent were reviewed. The review focused on studies within the last 15 years that covered habitats within 5 km of the River Tame, River Trent and the Humber Estuary.
- 2.4.3 The results showed that the majority of the studies reviewed (74%, or 17 of 23 studies) covered freshwater, wetlands and floodplains. Other studies tended to cover riparian habitats near the River Trent including enclosed farmland, urban green space, and woodland. Only 26% of studies (6 out of 23) covered coastal margins given most of the study area is inland with the exception of the Humber Estuary.
- 2.4.4 Most studies covered more than one Ecosystem Service, and the results show that the majority of the studies reviewed focused on biodiversity (78%), natural hazard regulation (70%), aesthetic value (65%), and recreation (65%). This is a function of the variety of studies that focused on flood risk attenuation in relation to the River Trent and the Humber Estuary, which have historically been susceptible to flooding. The material services that are not well covered by the literature included local climate regulation, pollination, disease and pest control and minerals. These services tend to be challenging to quantify in physical and monetary terms due to limitations in the existing evidence and approaches available. However, it has been possible to capture some of their characteristics by compiling and monitoring indicators of the extent and condition (quantity and quality) of habitats within the study area. This inventory of indicators constitutes a Natural Capital Asset Register for the study area.
- 2.4.5 Relatively few studies covered economic impacts, compared to the coverage of ecosystem services. The economic impacts primarily considered tended to be job creation and tourism. The latter impact is correlated with recreational benefits, which are well covered in the literature.
- 2.4.6 Social impacts were significantly less considered in the literature, compared to ecosystem services and, to a lesser extent, economic impacts. At most, 2 out of the 17 studies considered a given social impact. Social impacts, particularly those associated with community engagement, awareness raising, and preparedness are important in the context of the study area, given its historical susceptibility to flooding and pollution.
- 2.4.7 In close liaison with other assessment streams, baseline information for Gate 1 and Gate 2 was gathered to inform an understanding of the potential biodiversity and wider ecosystem services impacts of the SRO schemes. For example:
- Baseline ecological data has been collected using the UK Habitat Classification format (UKHab) for new data collection, e.g., for ground-truthing Phase 1 habitat or National Vegetation Classification (NVC) surveys for condition assessment of designated sites and priority habitats. This is a key part of the BNG process and allows Net Gain to be accurately calculated or predicted.

- The requirements for BNG assessment have been considered when designing the scope of ecological assessment and the associated condition assessment of designated sites and priority habitats, notably wetland habitats.
- There has been a focus on the designated sites and habitats identified as of High Ecological Sensitivity in the baseline assessment, whilst considering other areas within the Tame and Trent system that may be at risk of impacts due to the SRO proposals.
- Consideration of where existing or proposed Biodiversity Opportunities or Offsetting may be at risk due to the SRO proposals is critical in informing where further consideration has been necessary to ensure that potential impacts to these areas are accurately assessed in the light of the future baseline.
- Consideration of where designated sites or habitats are critical for protected or notable species, in particular where these are listed in the citations of designated sites, and where potential impacts to these species may be detrimental to the ability of these sites to reach target condition, has been critical to assess their potential to contribute to Net Gain.
- Consideration has been made of the effects of the SRO proposals on other ecosystem services provided by the river system and water-dependent habitats including, for example, opportunities for instream recreation (boating and angling), carbon storage and sequestration and flood control.

2.4.8 Initiatives to deliver Net Gain have been identified, and where possible inference of Natural Capital benefits, including but not limited to:

- Biodiversity Opportunity Mapping – this is well developed for some Local Authority areas such as Nottinghamshire and can provide a valuable focus on opportunities for habitat reinstatement, management, and linkages.
- Catchment-scale initiatives – the Catchment Based Approach (CaBA) is well developed in some areas with initiatives such as engaging with landowners and farmers to facilitate sympathetic land management practices, for example to reduce agricultural runoff and resulting pollution and nutrient enrichment.
- Engagement with stakeholders and regulators has been important to identify key areas where there may be aspirations for BNG at the catchment scale.

2.4.9 In order to provide additional background to the assessment, a baseline natural capital account for the full scheme was prepared for the full scheme area using AECOM's BioInstinct (version 0.7) tool. This tool allows rapid, automated assessments of natural capital assets and ecosystem service flows over large areas. The outputs are high level, broad estimates rather than local and specific. The outputs are intended to provide a broad overview of the baseline conditions across the scheme's area, in order to inform the more detailed assessments undertaken later on. Full details of the calculations and data sources used within version 0.7 of the BioInstinct tool are available upon request.

## Six Capitals Assessment

2.4.10 A six capitals approach is an extension to the standard financial approach to thinking about capital. In traditional thinking, financial or manufactured assets such as reservoirs or treatment plants are recognised as providing flows of goods or services that have value to businesses and society. It is designed to help organisations become more sustainable and resilient by considering value in the broadest sense. This approach shows the range of resources that we all rely and impact on but are often overlooked or undervalued in financial accounting and analysis. The approach allows a better understanding, and therefore better potential management of, the economic, environmental, and social impacts of the proposed schemes.

2.4.11 The six capitals assessment includes a range of indicators showing the extent and condition of existing and proposed assets, as well as the negative and positive impact of the proposed activities. The assessment is designed to provide opportunities for:

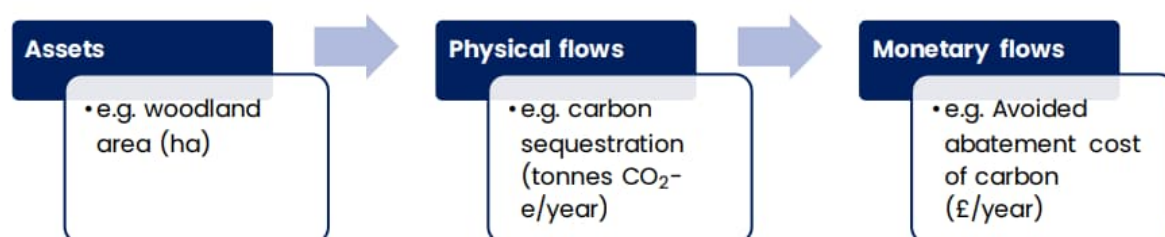
- **Knowledge:** Growing understanding of positive and negative impacts, and the things we depend on.

- **Engagement:** Sharing this knowledge to help customers and stakeholders shape our approach and hold us to account.
- **Service:** Applying this knowledge to become more efficient, resilient, and sustainable.
- **Public value:** Using this knowledge to grow our contribution to society, the economy, and the environment.

2.4.12 The six capitals approach is an enabler for an organisation to develop a more structured and integrated view of its impacts and dependencies in decision making to recognise the growing expectations to deliver greater public value in the face of unprecedented pressures, including:

- The challenges posed by the climate emergency and biodiversity crisis, which bring with them the risk of ecosystem collapse;
- Socio-economic changes, such as rising inequality and population growth; and
- The financial challenges of delivering public value in a financially constrained and regulated environment.

2.4.13 AECOM's six capitals approach is built around a framework of assets, flows and values, following the latest guidance from Defra and the Natural Capital Committee. This considers the extent and condition of assets and receptors, the physical flows of services and impacts upon them, as well as the monetary value of those impacts across all six capitals as illustrated in Figure 2-1.



**Figure 2-1: The assets/flows/values accounting framework used in this assessment**

2.4.14 The assessment followed the four stages outlined in the Capitals Coalition's 'Natural Capital Protocol'<sup>3</sup>, set out in Figure 2-2, as well as the 'Social and Human Capital Protocol'<sup>4</sup>. The assessment adopts an integrated six capitals approach which recognises natural, social, human, intellectual, manufactured, and financial capital, as set out in Figure 2.3.

<sup>3</sup> Capitals Coalition (2021) Natural Capital Protocol [online] available at: [https://capitalscoalition.org/capitals-approach/natural-capital-protocol/?fwp\\_filter\\_tabs=training\\_material](https://capitalscoalition.org/capitals-approach/natural-capital-protocol/?fwp_filter_tabs=training_material)

<sup>4</sup> Capitals Coalition (2021) Social and Human Capital Protocol [online] available at: <https://capitalscoalition.org/capitals-approach/social-human-capital-protocol/>

Figure 2-2: Overview of the stages of the Natural Capital Protocol

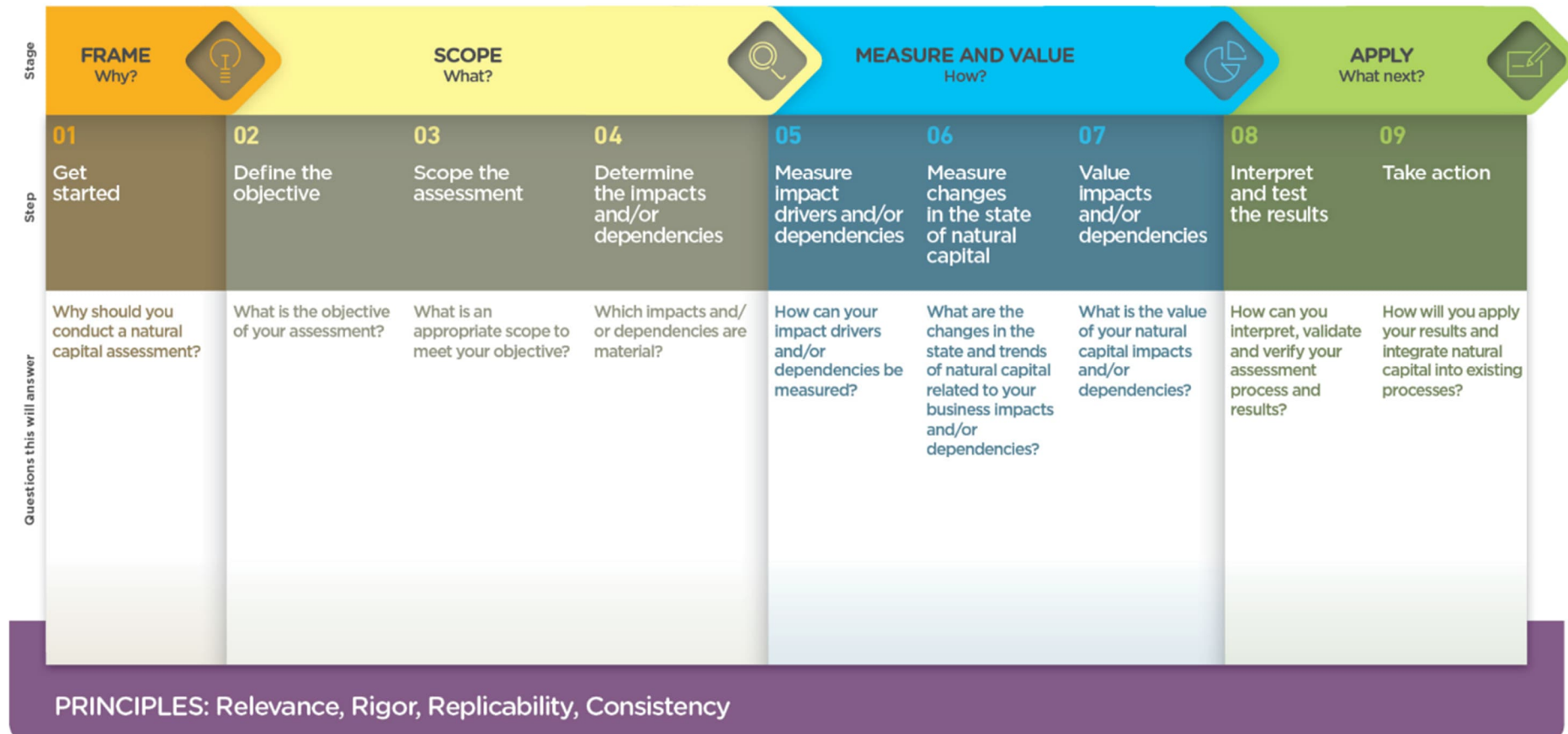
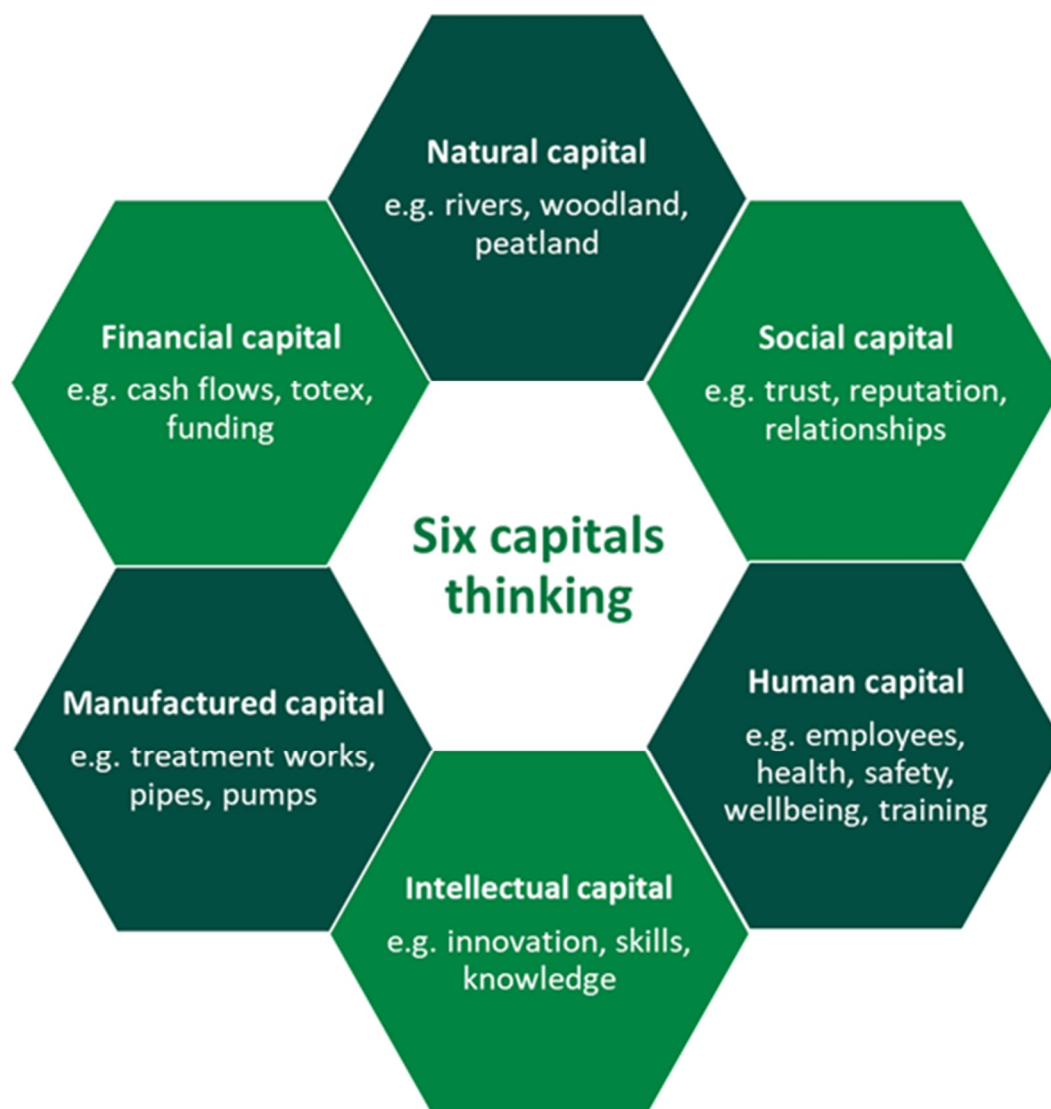


Figure 2-3: Components of an integrated six capitals approach



## Environmental Net Gain

- 2.4.15 A consistent approach to measuring biodiversity and environmental net gain has been taken. Applying a common approach and metric promotes a more consistent approach across the catchment for measuring and reporting biodiversity and wider environmental losses and gains with respect to land management and development activity. For biodiversity, NE's Biodiversity Metric 3.0<sup>5</sup> is the approach recommended in the EA's WRMP Guidelines and is also mandated for use through the planning system as set out in the Environment Act.
- 2.4.16 In preparation for the need for local authorities to develop Local Nature Recovery Strategies (LNRS), NE has created a National Habitat Network mapping layer. This provides spatial information on habitats most suitable for restoration and enhancement and is one of the data sources used to inform the design of LNRS. It is therefore recommended that any aspirations for habitat creation are aligned with the goals of the relevant LNRS.
- 2.4.17 In addition to considering opportunities to deliver BNG, an assessment has been made of where and how efforts to achieve BNG could also deliver wider environmental and socio-economic benefits, for example:

<sup>5</sup> Biodiversity Metric 3.1 was released in April 2022 but was too late to be used in this assessment. Metric calculations will be updated to Metric 3.1 at future assessment gates. The decision to use Metric 3.0 at this stage in the assessment is considered acceptable under the guidance released with the 3.1 Metric.

- Environmental benefits in terms of ecosystem services, such as flood risk protection, carbon sequestration, opportunities for recreation, etc.
  - Social benefits in terms of community engagement, greater inclusion, health benefits from recreation etc.
  - Economic benefits in terms of gross value added of different activities including expenditure linked to recreational trips to the river and surrounding habitats.
- 2.4.18 The benefits are assumed to be co-benefits of other actions that are either associated with the design of the SROs or the opportunities that are identified to deliver BNG. As such these two elements are the basis for identifying opportunities to deliver socio-economic benefits and wider environmental net gain.
- 2.4.19 We have articulated the potential benefits in qualitative terms with reference to the potential scale and location of benefits, and the receptors/beneficiaries. The assessment has been undertaken in accordance with good practice including Government guidance, such as Defra's resource on Enabling a Natural Capital Approach (ENCA).
- 2.4.20 The outcome of the Natural Capital and BNG Assessment is a preliminary assessment of the likelihood of Net Gain, or no net negative impact as a minimum, as a result of the potential impacts of the SRO proposals.

## Biodiversity Net Gain Assessment

- 2.4.21 DEFRA's 25-year Environment Plan seeks to '*embed an environmental net gain principle for development, including housing and infrastructure*'<sup>6</sup> it is also government policy that planning decisions should seek to minimise impacts on, and provide net gains for, biodiversity<sup>7</sup>. The Environment Act 2021<sup>8</sup> includes provisions to mandate the delivery of Biodiversity Net Gain in England. Secondary legislation, anticipated in late 2023, will require all relevant developments to achieve a minimum 10% net gain in biodiversity units relative to the site's baseline biodiversity value. Therefore, a BNG Assessment has been undertaken using DEFRA's Biodiversity Metric 3.0, in accordance with the metrics accompanying guidance<sup>9</sup> and industry accepted best practice principles<sup>10</sup>.
- 2.4.22 The approach to the Biodiversity Net Gain Assessment has been informed by further guidance set out in both the All Company Working Group (ACWG) 'WRMP environmental assessment guidance and applicability with SROs' and RAPID (2022) 'Strategic regional water resource solutions guidance for gate two'.
- 2.4.23 ACWG guidance sets out how:
- Biodiversity net gain or net loss (BNG/BNL) must be considered at both the option and programme level and that each option should look to maximise biodiversity net gains
  - That a biodiversity baseline should be developed from spatial data sets derived from habitat inventories and assessed in line with metric guidance to allow BNG change to be calculated for each option.
  - That Priority Habitat Inventories and site designations including Sites of Special Scientific Interest (SSSI) and Ramsar should be used to identify areas with high biodiversity importance.
  - That metric calculations should assign biodiversity units to the pre-impact land use according to the habitats present in the project boundary and that post-impact land use (including agreed mitigation) should be used to calculate the post-impact biodiversity score and calculate any percentage net gain or losses in biodiversity, and

<sup>6</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/693158/25-year-environment-plan.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf)

<sup>7</sup> [National Planning Policy Framework - GOV.UK \(www.gov.uk\)](https://www.nationalplanningpolicyframework.gov.uk/)

<sup>8</sup> <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>

<sup>9</sup> <http://nepubprod.appspot.com/publication/5850908674228224>

<sup>10</sup> <https://cieem.net/resource/biodiversity-net-gain-good-practice-principles-for-development-a-practical-guide/>



- That individual schemes should seek to supplement the open-source habitat data used in the assessment with local datasets or Phase 1/UKHab site data to increase the accuracy of the BNG calculation for each option.

#### 2.4.24 RAPID Gate 2 Guidance sets out how:

- The Gate 2 submission should be supported by an environmental appraisal that describes the connection to other assessments including BNG and that developments in England should seek to support the net gain actions in the Government's 25-year plan as described in para 2.4.20.

### Site Identification

2.4.25 Following a review of the designated sites and water-dependent wetland habitats identified during the Gate 1 desk-top assessment a total of 26 floodplain locations within 500m of the Rivers Tame and Trent (hereafter referred to as the Study Area), were identified for inclusion in the Gate 2 BNG Assessment. The following sites were then subject to preliminary ground truthing survey visits during winter and/or spring 2021/22:

- EON Meadows (Whitacre Flood Meadow Local Wildlife Site (LWS) & Whitacre Pool LWS) - 3 December 2021
- Ladywalk LWS - 3 December 2021
- Whitacre Heath Site of Special Scientific Interest (SSSI) - 3 December 2021
- Lea Marston LWS & Coton Pools LWS – 3 March 2022
- Kingsbury Wetlands (Water Park) LWS – 20 April 2022
- RSPB Middleton Lakes (Fisher's Mill Meadow LWS and Dosthill Pit & Middleton Hall Pit LWS) – 3 December 2021
- Tameside Local Nature Reserve (LNR) – 3 December 2021
- Broad Meadow LNR – 20 April 2022
- Drakelow Reserve LWS – 28 January 2022
- Sports Ground Marsh LWS – 28 January 2022
- Stanton Barn Marsh LWS – 28 January 2022
- Trentside Ponds LWS – 28 January 2022
- Trent Fleet LWS – 28 January 2022
- River Derwent Mouth Lock LWS - 10 December 2021
- Sawley Carr LWS - 10 December 2021
- Lockington Marshes SSSI - 10 December 2021
- Lockington Confluence Backwater LWS - 10 December 2021
- Attenborough Gravel Pits SSSI – 26 January 2022
- Clifton Grove, Clifton Woods and Holme Pit Pond LNR (including Holme Pit SSSI and Trent Carr LWS) - 17 December 2021
- Netherfield Lagoon LNR Netherfield Pits LWS - 17 December 2021
- Shelford Carr LWS - 17 December 2021
- Besthorpe Meadows SSSI – 16 December 2021
- Fledborough Holme LWS – 16 December 2021
- Lea Marsh SSSI – 16 December 2021
- Alkborough Flats LWS – 16 December 2021



- Humber Estuary Special Protected Area (SPA), Special Area of Conservation (SAC), Ramsar site & SSSI – 16 December 2021

## Habitat Identification/classification

2.4.26 At Gate 2 biodiversity metric calculations have been undertaken using a tiered approach to habitat identification/classification. Habitat types used in the Gate 2 BNG Assessment include:

- Wetland habitats identified during preliminary ground truthing survey visits during winter and/or spring 2021/22
- Wider non-water dependant site habitats, identified using open-source Priority Habitat Inventory data<sup>11</sup> held for each site, and
- For areas of 'white space'<sup>12</sup> within each site boundary, neither identified as wetland or priority habitat, a proxy UKHab habitat of "Grassland - Floodplain Wetland Mosaic" has been used to ensure full site coverage.

2.4.27 Habitat data has been converted into UK Habitat (UKHab) Classification habitat types used by the Metric 3.0 by a qualified ecologist. Both Phase 1/UKHab and NVC vegetation surveys are seasonally constrained. Therefore, it is intended that the results of the habitat condition assessment surveys scheduled for 2022 will further refine the above data set in order to fully inform the Gate 3 assessment.

2.4.28 Habitat areas have been recorded and measured digitally using a Geographic Information System and net gain calculations have been undertaken in excel using the published Metric 3.0 algorithms.

## Assigning Habitat Distinctiveness and Condition

2.4.29 At this high-level assessment stage habitat condition has been assigned using distinctiveness as a proxy. Therefore, habitats with a 'Very High' distinctiveness have been assigned a 'Good' condition, habitats with a 'Medium' distinctiveness have been assigned a 'Moderate' condition and habitats with a 'Low' condition have been assigned a 'Poor' Condition. This precautionary approach weights the value of higher distinctiveness habitats to ensure potential impacts are not underestimated at this stage in the assessment.

## Assigning Strategic Significance

2.4.30 At this high-level assessment stage Strategic Significance has been assigned based on each site's statutory or non-statutory nature conservation designation. With all sites being designated Local Wildlife Site or higher all sites have been assigned as being of 'High' strategic significance. At Gate 3 Strategic Significance for each site will be further refined using an 'opportunity mapping' approach using a combination of open-source habitat datasets alongside Local Nature Recovery/Biodiversity Opportunity Areas. The final strategic significance scores for each site/habitat at Gate 3 will be agreed during stakeholder engagement sessions.

## Post-impact habitat data

2.4.31 The river level, depth and wetted perimeter changes as a consequence of the proposed options have been modelled using Aquator software. From the preliminary model results, it appears that changes in river level, depth and wetted perimeter are very minor and prevalent during extreme low flows. The greatest change in river level is predicted in the upper Tame in two localities:

- Between Ladywalk LWS and Whitacre Heath SSSI, and
- Between Coton Pools LWS and Kingsbury Water Park LWS

2.4.32 Seasonal winter flooding of the Tame and Trent floodplains is predicted to continue and will not be affected by the scheme options. The SRO options are predicted not to have a significant effect on water levels on wetland habitats either side of the tidal River Trent (downstream of Cromwell Lock).

2.4.33 The hydrological assessment has considered whether surface waters in the SSSIs may be affected directly from lower flows in the rivers Tame and Trent, and whether changing water levels will affect groundwater levels that then may affect surface water features in the SSSIs. This has then been

<sup>11</sup> <https://data.gov.uk/dataset/4b6ddab7-6c0f-4407-946e-d6499f19fcde/priority-habitat-inventory-england>

<sup>12</sup> Areas of land within the redline boundary of the designated site that contained no priority habitat data or wetland habitat identified during site surveys

considered in the context of natural seasonal variation in water levels in the rivers and aquifers, and other features controlling water levels near the SSSIs such as weirs, abstractions, and discharges.

- 2.4.34 From the preliminary model results no significant effect on groundwater levels that then may affect surface water features which sustain wetland habitats are predicted. Therefore, post-development modelling of BNG assumes no reduction in existing habitat condition or any degree of habitat loss or reduction in habitat extent. Therefore a 10% gain for all scenarios has been modelled by calculating metrics that aim to enhance existing habitat condition values.
- 2.4.35 The findings of this preliminary BNG assessment in the accompanying Metric 3.0 spreadsheet has been provided in the Annex of this report. Refer to Appendix B(i) Ecology for supporting figures illustrating relevant designated sites and priority habitats.
- 2.4.36 At Gate 3, in order to demonstrate a more accurate 10% Biodiversity Net Gain for the proposed scheme, it is recommended that opportunities to create and enhance wetland habitats within the Study Area are identified through a combination of habitat opportunity mapping and stakeholder engagement. The creation of new wetlands within the Study Area will particularly benefit those species associated with those habitat types. The selection of candidate wetland habitat creation and enhancement sites will need to be discussed with local biodiversity groups and will aim to benefit key habitats and the species they support.

## Priority Areas

- 2.4.37 A baseline register has been compiled of habitat extent and condition at key sites within the River Trent, River Tame and Humber Estuary study area.
- 2.4.38 This baseline has been informed by existing data sets held by Natural England, Local Biodiversity Record Centres, Local Nature Conservation organisations (inc. Wildlife Trusts), Centre for Ecology & Hydrology (CEH) Landcover mapping and the analysis of aerial imagery.
- 2.4.39 Where the requirement for further ecological site surveys was identified, BNG habitat condition surveys (UKHab) have been completed as part of the survey methodology. However, as BNG Condition Assessments, Phase 1 habitat, and NVC vegetation surveys are seasonally constrained, it is possible that comprehensive survey data will not be available to inform the Gate 2 assessment. Therefore, the results of these surveys will inform future stages of the assessment, i.e., Gate 3. At the Gate 2 stage, where existing condition data does not exist, a combination of habitat distinctiveness and professional judgement has been used to determine an indicative habitat condition value.
- 2.4.40 Habitat extent and condition data has been compiled into a GIS system to facilitate access, data sharing and ease of update. This mapping tool has been used to identify where opportunities to protect, restore or enhance biodiversity and other ecosystem services may be targeted during further stages of the project.
- 2.4.41 To ensure a strategic approach is taken to identifying potential offsetting sites, additional key partners and stakeholders have been identified through a scoping exercise.
- 2.4.42 The impacts of flow changes on ecosystem services and the associated social and economic benefits those services provide have been focused on areas where the outputs of the hydrological modelling and ecological assessments reveal changes in flow levels that could impact upon instream recreation (boating, angling) or on the condition of SSSIs and other terrestrial habitats that provide carbon storage, sequestration, and flood control services.

## Data and Information Requirements

Site	Data Type
SAC/SPA/SSSIs/NNR	Natural England condition survey data, integrated site assessment data, site citations, site improvement plans, any appropriate review of consents, catchment management plans and diffuse pollution plans. Where not available from Gate 1 assessment, further data will be sought.

LWS	Local Authorities and Local Wildlife Trusts. Where not available from Gate 1 assessment, further data will be sought.
Third party data	Local biological record centres Habitat and species data (potential cost to commission – some licenses already in place). CEH Landcover map (cost to purchase).
Open Data	National priority habitat data (magic.gov.uk) National Habitat Network data (magic.gov.uk) Protected sites data boundaries (magic.gov.uk)

## 2.5 Limitations

### Six Capitals and BNG Assessment

- 2.5.1 The following limitations have been identified in terms of the six capitals and BNG assessment:
- 2.5.2 The use of Gate 1 baseline assessment data as well as the extensive use of assumptions to cover the current limited quantitative data, result in a reduced level of confidence in the accuracy of the assessment. Where data was available the capitals impacts have been valued to the highest resolution possible. However generally, detailed data to undertake quantitative assessment of the scoped in impacts is not yet available. The data gaps are explored further in the results section. These gaps will be filled with further results expected from ongoing assessments and further information regarding potential mitigation measures, which will help refine this assessment at Gate 3.
- 2.5.3 There are potential overlaps between the impact and dependencies identified across the six capitals. However, the risk of double-counting has been avoided by utilising tools and data sets which measure specific and different parameters for the services that have been scoped in.
- 2.5.4 The assessment has been performed using a combination of ground truthing and open-source habitat data. Therefore, a precautionary approach has been applied by using habitat distinctiveness as a proxy when assigning habitat condition. Habitat condition surveys are scheduled to be undertaken during the 2022 survey season and will be used to refine the calculation at the Gate 3 stage.
- 2.5.5 Condition enhancement has been modelled across all sites selected for inclusion in the Gate 2 assessment. Distinctiveness values across all habitats ranged from 'Moderate' – 'V.High'. Only those habitats with a distinctiveness values between 'moderate' to 'high' have been included in the condition enhancement modelling at this stage in the assessment. At Gate 3 a more targeted and strategic approach will be undertaken to habitat enhancement and creation. With a combination of opportunity mapping and stake holder engagement used to identify habitats suitable for restoration, enhancement or creation.

# 3. Results

3.1.1 This section summarises the results of the environmental assessment to date. Refer to the overall Environmental Assessment report for a summary of results and recommendations.

## 3.2 Baseline Natural Capital Account

### Natural capital asset account

3.2.1 A map of the study area is set out in the figure overleaf. A breakdown of the habitat types by area and biodiversity units is set out in the figures below. Full details of the asset account are set out overleaf.

3.2.2 As it is shown in the figures below, the majority of the study area is made up of arable and horticultural land, and acid, calcareous, neutral grassland. There are also relatively large areas of built-up areas and gardens, broadleaved woodland, wetlands, and improved grassland.

3.2.3 The majority of the biodiversity units are provided by the semi-natural grassland areas followed by the wetlands and woodlands. Farmland also makes up a large part of the biodiversity units although this is because of the large extent of this habitat type. Using a measure of biodiversity units per ha of each habitat, the bogs and wetlands are the most important habitat types.

**Figure 3-1: Extent of habitats with the study area**

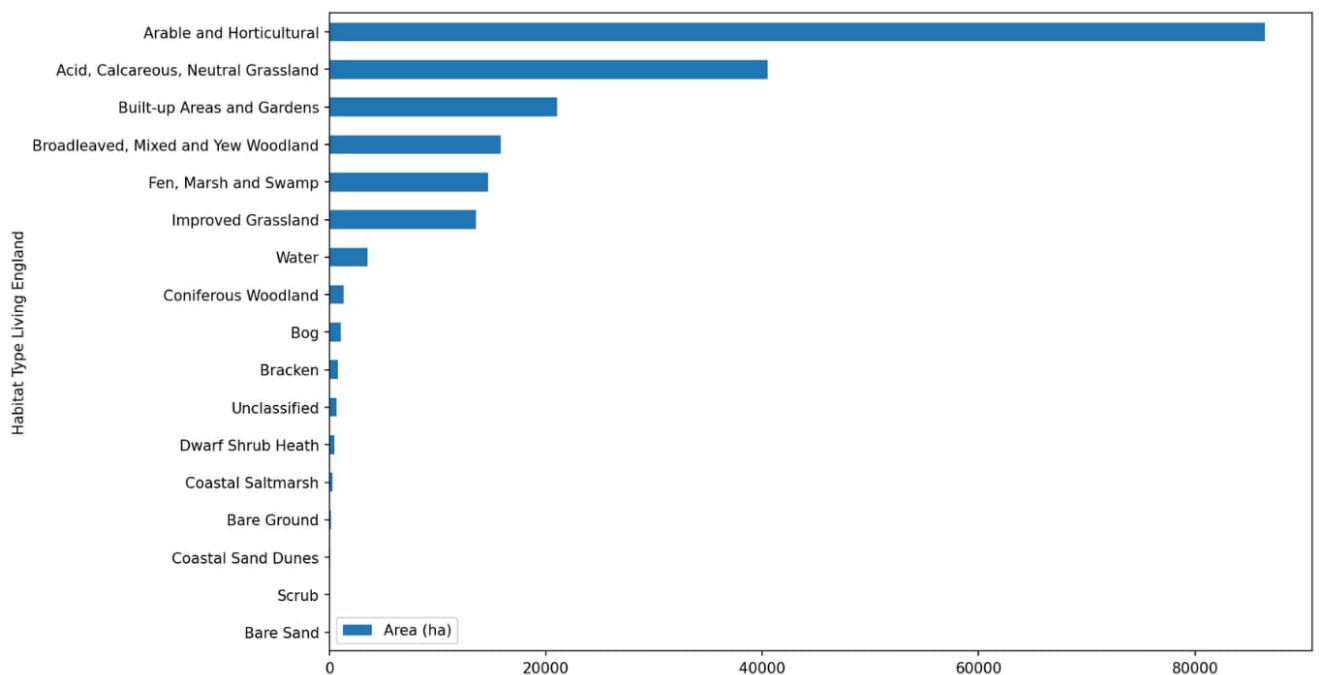


Figure 3-2: Biodiversity units by habitat type

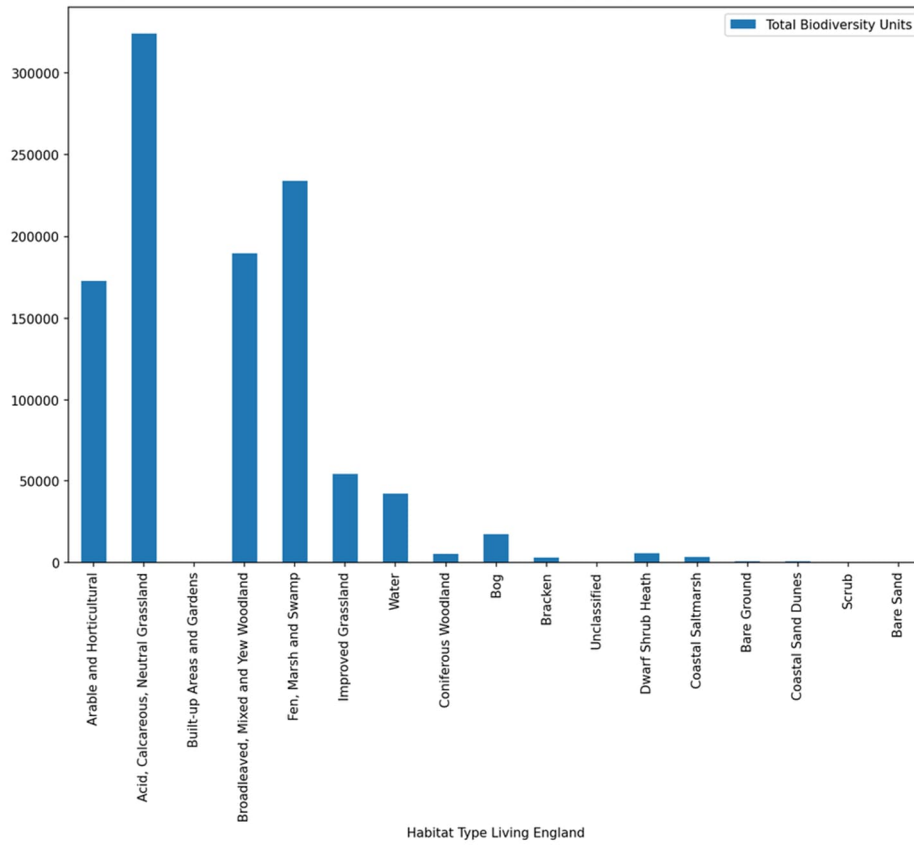


Figure 3-3: Average number of biodiversity units per ha of each habitat type

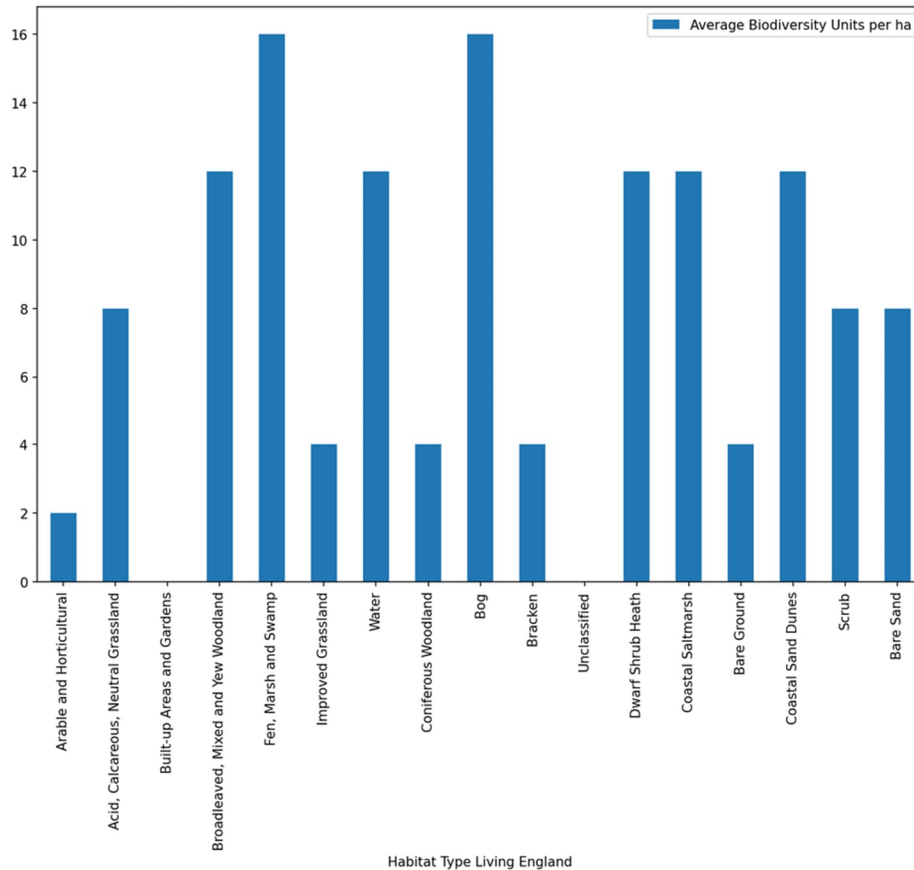
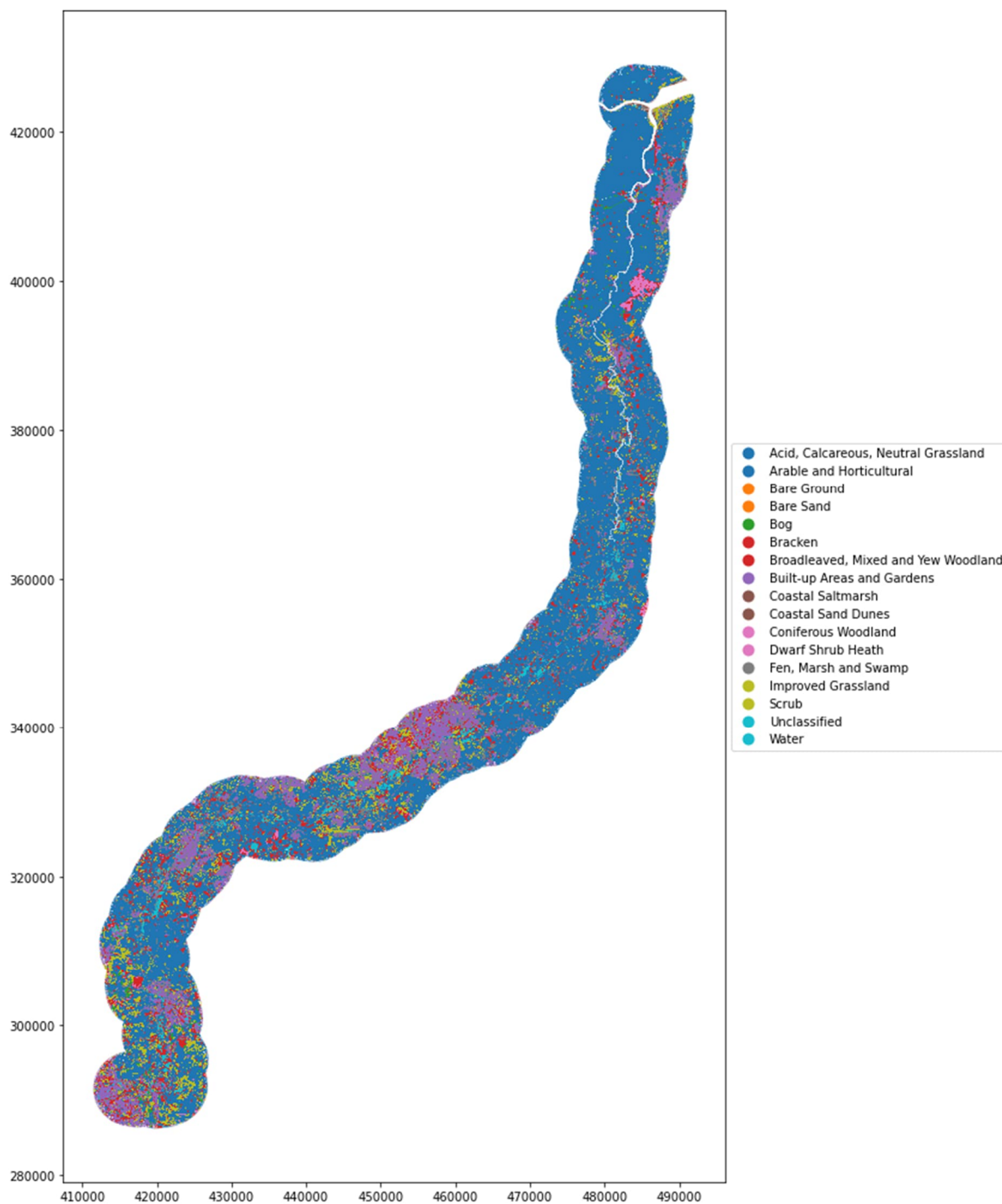


Figure 3-4: Habitat map of the Study Area (refer to accompanying Figure 1)



**Table 3-1: Natural capital asset account for the study area**

	Habitat Type Living England	Habitat Type Biodiversity 3.1	Area (ha)	Distinctiveness	Condition	Strategic significance	Total Biodiversity Units	Average Biodiversity Units per ha
0	Acid, Calcareous, Neutral Grassland	Neutral grassland	40,503	Medium	Moderate	Low	324,022	8
1	Bracken	Bracken	787	Low	Moderate	Low	3,148	4
2	Improved Grassland	Modified grassland	13,570	Low	Moderate	Low	54,282	4
3	Arable and Horticultural	Cereal crops	86,493	Low	Low	Low	172,986	2
4	Bare Ground	Vacant/derelict land/ bare ground	168	Low	Moderate	Low	671	4
5	Bare Sand	Littoral sand	4	Medium	Moderate	Low	34	8
6	Bog	Blanket bog	1,076	V.High	Moderate	Low	17,218	16
7	Fen, Marsh and Swamp	Fens (upland and lowland)	14,638	V.High	Moderate	Low	234,203	16
8	Broadleaved, Mixed and Yew Woodland	Lowland beech and yew woodland	15,824	High	Moderate	Low	189,885	12
9	Coniferous Woodland	Other coniferous woodland	1,335	Low	Moderate	Low	5,340	4
10	Scrub	Mixed scrub	17	Medium	Moderate	Low	138	8
11	Built-up Areas and Gardens	Developed land; sealed surface	21,032	V.Low	Moderate	Low	0	0
12	Coastal Saltmarsh	Saltmarshes and saline reedbeds	275	High	Moderate	Low	3,297	12
13	Coastal Sand Dunes	Coastal sand dunes	74	High	Moderate	Low	885	12
14	Dwarf Shrub Heath	Lowland Heathland	466	High	Moderate	Low	5,587	12
15	Water	Moderate alkalinity lakes	3519	High	Moderate	Low	42,225	12
16	Unclassified	Unclassified	684	-	Moderate	Low	0	0
<b>Total</b>			<b>200,464</b>				<b>1,053,921</b>	

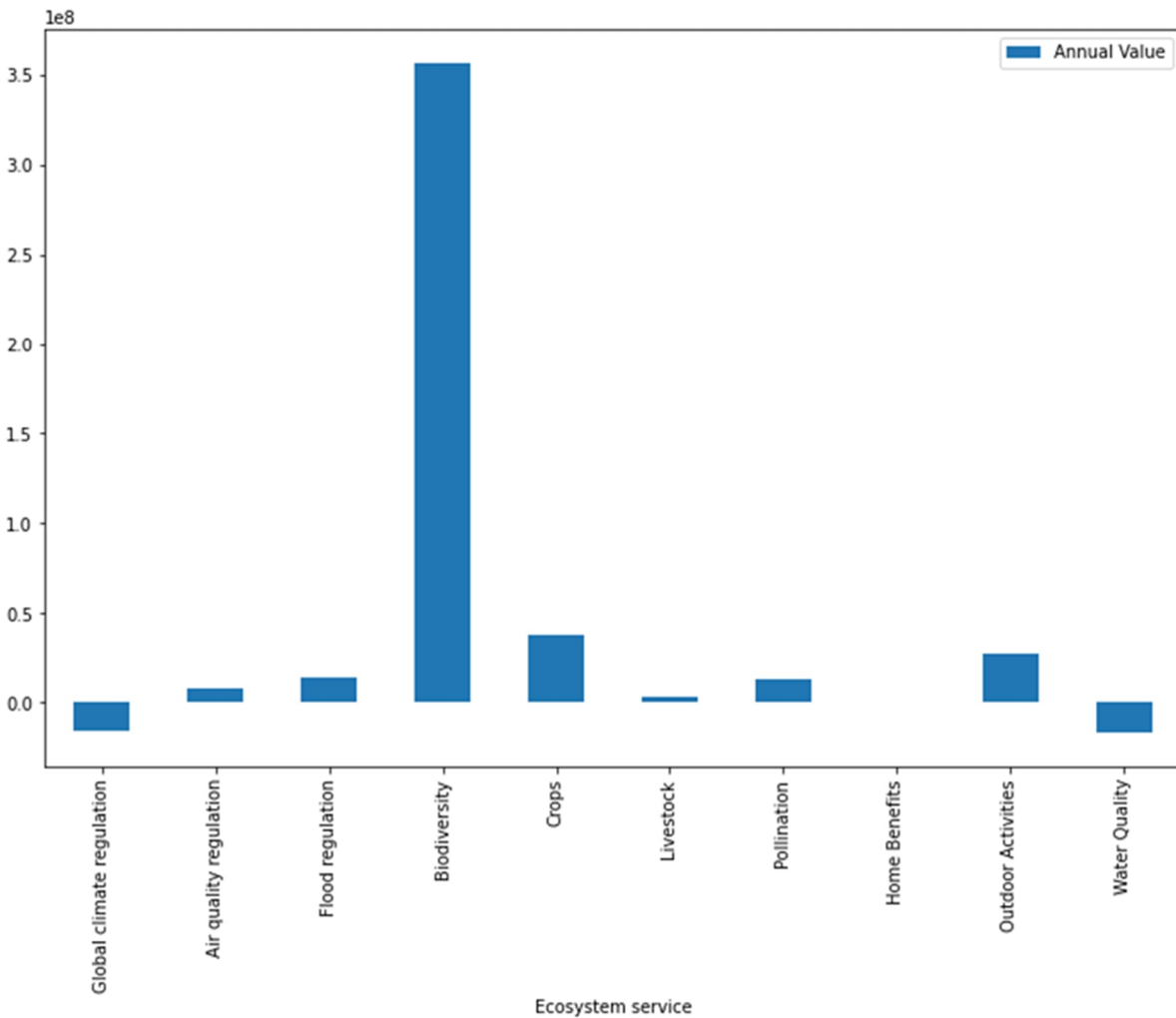


## Physical and Monetary Flows Account

3.2.4 A summary of the ecosystem service flows for the study area, and the values they generate, is provided in the figure below. Full details of the physical and monetary flows account are set out overleaf.

3.2.5 As is shown in the figure below, the most significant component of value is generated by biodiversity. This is followed by crops and recreation. There are small negative impacts arising from global climate regulation (primarily due to carbon emissions associated with crop land), and water quality regulation (due to the use of fertilisers for crop and livestock management).

**Figure 3-5: Value of ecosystem services provided by natural capital assets within the study area (2020 prices, millions)**



**Table 3-2: Physical and monetary flows account for the study area**

	Ecosystem service	Metric	Quantity	Metric Unit	Annual Value	Annual Value Unit	Asset Value (30 year)	Asset Value (30 year) Unit
0	Global climate regulation	Carbon sequestered (-) / emitted (+)	63,000	tCO <sub>2</sub> e/yr	-£15,500,000	£2020 prices/yr	-£285,400,000	£2020 prices
1	Air quality regulation	Pollution removed (-) / emitted (+)	-10,000	t/yr	£7,700,000	£2020 prices/yr	£141,300,000	£2020 prices
2	Flood regulation	Quantity of water stored	29,472,000	m <sup>3</sup> /yr	£14,300,000	£2020 prices/yr	£262,900,000	£2020 prices
3	Biodiversity	Biodiversity units lost (-) / created (+)	32,000	BDUs/yr	£356,500,000	£2020 prices/yr	£6,557,100,000	£2020 prices
4	Crops	Tonnes of crops produced	698,000	t/yr	£37,800,000	£2020 prices/yr	£695,200,000	£2020 prices
5	Livestock	Number of livestock	51,000	t/yr	£3,000,000	£2020 prices/yr	£55,400,000	£2020 prices
6	Pollination	Area of land pollinated	160,000	ha/yr	£14,000,000	£2020 prices/yr	£256,700,000	£2020 prices
7	Visual & amenity	Houses benefitting from proximity to natural habitats	200,000	No./ha/yr	£600,000	£2020 prices/yr	£11,200,000	£2020 prices
8	Recreation	Number of outdoor activities	3,862,000	No./ha/yr	£27,500,000	£2020 prices/yr	£505,100,000	£2020 prices
9	Water quality	Pollutants removed from (-) / added to (+) water	-2,643,000	kg/ha/yr	-£16,600,000	£2020 prices/yr	-£306,200,000	£2020 prices
<b>Total</b>					<b>£429,200,000</b>		<b>£7,893,300,000</b>	

## 3.3 Non-Water Resources Impacts and Benefits

3.3.1 The aim of this section is to detail the quantitative and qualitative assessments of the six capitals in relation to the Minworth and SLR SROs, in terms of potential impacts, wider benefits, and considering recommended mitigation options as informed by other assessment topics. The six capitals assessment has been completed for the following scenarios numbered from '0' to '3', based on the potential utilisation scenarios for Minworth and SLR:

- 0 – 'do-nothing' – the no-change scenario;
- 1 – Minworth SRO: 230 MI/d flow reduction diverted from Minworth and associated mitigation actions;
- 2 – SLR SRO: abstraction of 300 MI/d from the River Trent for SLR and associated mitigation actions;
- 3 – Minworth & SLR SROs: maximum flow reduction caused by the two SROs in combination (530 MI/d) and mitigation actions.

### Frame stage: Why?

#### Step 01: Get started

3.3.2 The assessment involved measuring potential impacts against the baseline scenario while considering the benefits from targeted actions to mitigate any reductions in flow. The aim is to explore the opportunities for wider benefits in the catchment. The six capitals assessment was undertaken to evaluate the relative costs and benefits of all scenarios and to determine whether the additional costs associated with the operational phase of the SROs and mitigation actions are commensurate with the benefits they may provide.

### Scope stage: What?

#### Step 02: Define the objective

3.3.3 The objective is to build an understanding of the impacts and dependencies across the six capitals and infer multi-capital benefits and costs delivered by the implementation of the SROs and the opportunities to deliver BNG. Following the Natural Capital Protocol, the assessment aims to compare the costs and benefits between the four scenarios, informing long-term best value solutions in terms of Net Present Value.

#### Step 03: Scope the assessment

3.3.4 The assessment scope was defined as follows:

- **Spatial scope:** The area covered by this study is the catchment of the Rivers Tame, Trent and the Humber Estuary, from 2 km upstream of the current discharge point (SP 16479 91529) from Minworth Wastewater Treatment Works (WwTW), to 2 km downstream of the confluence (SE 86275 23108) of the River Trent with the Humber Estuary. This study area therefore extends from approximate grid reference [REDACTED] upstream of Minworth WwTW, to grid reference [REDACTED] downstream on the Humber Estuary, and within 5 km of the rivers Tame and Trent, as per the Gate 1 baseline assessment.
- For simplicity reasons, it has been considered that anything upstream of the SLR abstraction at East Stoke (SK 75747 50375) is only related to the Minworth assessment, while anything downstream of the SLR abstraction is subject to potential impacts from both schemes.
- **Temporal scope:** to be consistent with the BNG assessment's timeframe, the assessment covers a 30-year time horizon from the beginning of the operational phase which is assumed to be 2031 (from 2031 to 2060) and excludes the construction phase (which is being assessed separately as part of the Engineering workstream).
- **Discounting:** a 3.5% declining discount rate is applied as per the HM Treasury Green Book (2022) guidance which is the government guidance used for best practice appraisal of policies, programmes, and projects. The discount rate is used to convert costs and benefits

with different time spans into a 'present value', allowing their comparison in terms of their value in the present. The 3.5% rate has been used in the UK since 2003 in UK government appraisal. Declining the rate over the long term allows to account for uncertainty about future values of its components. In practice, this means that starting from year 30, the rate declines to 3.00%.

- **Types of costs and benefits:** the assessment incorporates the costs and benefits under the six capitals approach. The impacts and/or dependencies are identified for each scenario and analysed based on whether they are considered to be material.
- **Value chain boundaries:** the impacts of the SROs are focused on direct operations, although downstream and upstream impacts are included where considered material.
- **Price years:** all values were adjusted to 2020 prices, using a CPIH deflator, as adopted by the WINEP natural capital metrics.

3.3.5 Although full utilisation of water abstraction is only expected in the summer months to cope with increased summer peak demands, this assessment assumed the SROs will operate at full capacity permanently to ensure no risk is excluded and to better reflect worst-case scenarios. This assessment was built on ongoing Gate 2 assessments and on the work completed in Gate 1 for which AECOM was instructed to gather baseline information and undertake a Hydrology, Environment and Ecological (HEE) gap analysis of the River Tame, River Trent and Humber system.

#### Step 04: Determine the impacts and/or dependencies

3.3.6 To determine impacts and/or dependencies on the six capitals to be included in the valuation assessment, a qualitative materiality assessment was undertaken, see Table 3-3. Results for the materiality assessment were informed by data and reports in the approach to Gate 1 assessment, as well as by working closely with other disciplines, incorporating the results of their respective assessments. For each metric, the relative impact of each scenario was assessed using the following qualitative rating:

- ↑↑ significant positive impact
- ↑ minor positive impact
- → no overall impact
- ↓ minor negative impact
- ↓↓ significant negative impact
- ↑/↓ both positive and negative impacts

3.3.7 Based on the above qualitative assessment, the materiality of potential impacts was categorised as:

- **High** = high positive or negative impact and likely to be of importance
- **Moderate** = moderate impact and potential to be of some importance
- **Low** = low impact and unlikely to be of importance (includes those classified with no overall impacts)

3.3.8 The impacts considered with 'High' materiality have been included in the measure and value stage (see Step 05) of this assessment. The final list of agreed material capital impacts under the four scenarios can be found in Section 1.12.9 and the reasoning for the impact scoring is presented in Table 3-3 below.

3.3.9 Potential impacts at this stage have been scoped in for the following components of the six capitals:

- **Natural Capital:**
  - Global climate regulation
  - Water quality
  - Recreation
  - Biodiversity
- **Social Capital:**

- n/a
- **Human Capital:**
  - n/a
- **Intellectual Capital:**
  - n/a
- **Manufactured Capital:**
  - n/a
- **Financial Capital:**
  - OPEX

**Table 3-3: Natural capital materiality assessment for the four scenarios numbered from '0' to '3' at Minworth and SLR SROs**

Six capital impacts / dependencies	Direction of change				Rationale	Materiality of change
	0	1	2	3		
<b>Natural capital</b>						
Crops	→	↓	↓	↓	A pump out scheme on the river Mease may have an impact on the downstream farmers at the confluence of the Trent. However, given that modelling has shown that there will not be a significant impact on levels in the Mease, the materiality of the impact has been deemed moderate. This requires further investigation at Gate 3.	Moderate
Livestock	→	→	→	→	No material impacts identified.	Low
Fisheries	→	↑/↓	↑/↓	↑/↓	Barriers to fish migration are unlikely to be exacerbated by the drop in water levels, meaning access to areas that are essential for key fish life stages are maintained (Refer to Aquatic Ecology assessment, Appendix B(ii)). Sedimentation accumulation at the riverbed is unlikely to be worsened, meaning that there will be no detriment for fish spawning, feeding and nursery habitats as well as for invertebrates and macrophytes, upon which fish depend (Refer to Sedimentation assessment, Appendix E). This could be mitigated with appropriate interventions such as building/maintaining/improving fish passes or weir removal. Mitigation could also include enhancing fish refuges created along the Tame to connected wetland habitats to support recovering fish populations. Water quality assessment is ongoing to establish whether changes in water quality may occur, which may impact fish populations positively or negatively; at this stage it is assumed that water quality will remain the same. Given that appropriate mitigation measures and interventions will be used and the fact that water quality impacts on fish will not be significant the materiality of the impact of the scenarios on this ecosystem service has been deemed moderate.	Moderate
Aquaculture	→	→	→	→	No material impacts identified.	Low
Wild foods	→	→	→	→	No material impacts identified.	Low
Timber	→	→	→	→	No material impacts identified.	Low
Energy (renewable)	→	→	→	→	No material impacts identified.	Low
Biochemicals and	→	→	→	→	No material impacts identified.	Low

medecines						
Water supply	→	↑↑	↑↑	↑↑	Both SROs aim to provide greater water resilience in the water supply in the long term for South-East England without impacting the water supply locally. Given this benefit is being assessed separately as part of the GUC and STT assessments, it has been deemed a Low materiality impact for this assessment.	Low
Fibres and ornamental resources	→	→	→	→	No material impacts identified.	Low
Genetic resources	→	→	→	→	No material impacts identified.	Low
Local climate regulation	→	→	→	→	No material impacts identified.	Low
Global climate regulation	→	↑↑	↑↑	↑↑	<p>The baseline comprises various habitats including riparian and wet woodland, and coastal and floodplain grazing marsh, representing the most significant habitats within the study area, and also including lowland fens and coastal saltmarsh. These habitats provide important carbon sequestration benefits and are not likely to be impacted by either of the two schemes as no significant change in these habitats' extent and conditions is expected from the reduction in flow (refer to BNG assessment and Ecology assessment, Appendix B(i)).</p> <p>However, carbon benefits are likely to be delivered through mitigation measures, particularly those aiming to create and enhance woodlands, wetlands, reedbeds, and grasslands – mitigation measures and locations are yet to be finalised, but it is assumed that a net gain of 10% will be achieved for both schemes in terms of habitat creation and enhancement. As such it is likely that there will be significant positive impacts in relation to increases in carbon sequestration and storage.</p> <p>Furthermore, construction and operational carbon emissions are being assessed separately as part of the engineering workstreams. These are likely to have a significant influence in terms of carbon flux changes from the project but are not within the scope of this assessment.</p>	High
Flood regulation/ Erosion	→	→	→	→	There will be no change in flooding for both SROs. Even when considering the most significant drop in water level, estimated to be 19 cm (in the river Tame upstream of Whitacre Heath SSSI), flood events will remain unchanged, and it is not anticipated that flood risk will change. No material impacts are expected.	Low
Water quality	→	↑	→	↑	<p>Water body status is less than good in all reaches studied. There are three main Reasons for Not Achieving Good status (RNAG): pollution from wastewater (water industry), pollution from rural areas (agricultural and rural land management) and pollution from towns/transport (urban and transport) (refer to the Aquatic Ecology assessment, Appendix B(ii)).</p> <p>Minworth effluent is already treated to a good standard and may currently improve water quality in the Tame (compared to water quality flowing downstream from Birmingham). However, not discharging the effluent from Minworth into the River Tame may remove phosphates and contaminants, contributing to water quality improvement (water quality modelling is underway to inform the WFD assessment).</p> <p>While scenario 2 (SLR abstraction) is unlikely to result in any change in water quality, there is potential to deliver water quality improvements through scenario 1 and 3 as such the impacts on the provision of water quality have been deemed high.</p>	High
Disease and pest control	→	↑/↓	↑/↓	↑/↓	The water bodies in the vicinity of Minworth are currently affected by at least five Invasive Non-Native Species (INNS), among which three higher risk species identified are marginal plant species (i.e., Giant hogweed, Himalayan balsam, Japanese knotweed). The sewage treatment process	Moderate

					<p>is likely sufficient to mitigate INNS spread risk and unlikely that effluent discharge from Minworth presents a risk of INNS spread to the River Tame. There are many INNS (16 species) in the vicinity of the proposed abstraction from the Trent for SLR (i.e., aquatic and marginal plants, bivalve molluscs and free-swimming invertebrates and fish), most of them being High Risk. At Minworth, there is a risk of spread of riparian INNS (Himalayan balsam, Japanese knotweed, giant hogweed) in margins minimally widened by the flow reduction. Therefore, if the river level drops, these species may spread more easily in the increased riparian zone downstream. This potential for increased spread of INNS is considered moderate. Removing all INNS from the Minworth site would help mitigate the spread, although annual monitoring would still be necessary.</p> <p>For SLR, there is a minor risk of INNS being transferred from the Trent to the River Witham, which could be mitigated with integrated treatment systems including the design of the pipeline inlet, potentially including fish screens and filters, and chemical and/or UV treatment.</p>	
Noise regulation	→	→	→	→	No material impacts identified.	Low
Soil quality regulation	→	→	→	→	No material impacts identified.	Low
Recreation	→	↑↑	↑↑	↑↑	<p>Recreation is important for both the Trent and the Tame. Watercourses and water bodies in the Tame/Trent Valleys are essential for water sports, angling, and boating, and include many riparian footpaths and rights of way. Wetlands and green spaces also support a diversity of recreational uses including wildlife observation, nature study, freshwater fishing, etc. The Attenborough nature reserve in Nottinghamshire attracts 250,000 visitors per year. The Trent Valley Way, which is a 270 km path that starts near the source of the Trent in Staffordshire and follows the Trent Valley to join the Humber Estuary south of Hull, is subject to substantial local demand, with around 127,000 people expected to use the trail each year. The Tame Valley Wetlands follow 29km of the river Tame covering 1,000 ha of wetlands, of which 250 ha are located within Kingsbury water park, the jewel in the crown of Warwickshire County Council's Country Parks, which attracts 250,000 visitors per year. RSPB Middleton Lakes is another mosaic of wetlands, meadows, and woodlands, providing several kilometres of trails for walking and wildlife watching, which has attracted between 30,000 and 40,000 visits per year since opening in 2011. Angling clubs, boating, jet skiing and shooting are all present along the Tame Valley.</p> <p>As described elsewhere, it is not considered that there will be any loss of connectivity or fragmentation of aquatic habitats, and therefore there will be no negative impacts on fish of socio-economic importance, and no corresponding decrease in the value of angling activities.</p> <p>Mitigation options to obtain wider benefits and achieve 10% net gain in terms of habitat creation/enhancement are likely to provide recreation benefits. Grassland and wet woodland enhancement, wetlands and reedbeds creation, and access path restoration will increase opportunities for walking, bird watching, water sports, picnic, and pond dipping facilities for local communities, etc. if made accessible to the public.</p> <p>With these commitments in mind, recreation has been deemed high materiality.</p>	High
Heritage	→	→	→	→	No material impacts identified.	Low
Visual and amenity	→	→	→	→	No material impacts identified.	Low
Biodiversity	→	↑↑	↑↑	↑↑	Priority habitats extent and conditions are likely to be positively impacted by the schemes in terms of mitigation measures designed to achieve a 10% net gain, resulting in a positive impact on species dependant on these habitats. Biodiversity improvement is expected from various	High



					mitigation options which aim to restore, create, or enhance habitats, and remove waste (e.g., clay pigeon plastic disks from the sites around the Tamworth Clay Pigeon Shooting centre; opportunities to remove litter and urban trash from the mentcourses). Therefore, a material significant benefit is expected.	
<b>Social capital</b>						
Trust and reputation	→	↑	↑	↑	<p>Any potential negative impacts such as INNS spread and water quality may erode the Public's trust in the Water Companies; however, this is proposed to be remediated with appropriate mitigation measures. Commitments to achieve 10% net gain in terms of habitat creation/enhancement, and to seek wider benefits through the SRO schemes, will serve to enhance trust and reputation.</p> <p>Anglian Water, Affinity Water, and Severn Trent customers' views on the two SROs collected as part of a programme of customer engagement in the approach to Gate 1, showed a global support for 'sharing' water resources.</p> <p>While customers concerns have been recorded for instance over a potential change in taste and water hardness relating to the Minworth SRO. The recreational and environmental benefits and ambitions that will be delivered are seen to far outweigh any localised impacts. These positive wider benefits alongside keeping customers informed of the impacts and decisions as the assessments are progressed and communicating on how potential issues will be addressed will maintain and improve their trust and support.</p>	Moderate
Wellbeing	→	→	→	→	No material impacts identified.	Low
Quality of service	→	→	→	→	No material impacts identified.	Low
Community and place	→	→	→	→	No material impacts identified.	Low
Vulnerability	→	→	→	→	No material impacts identified.	Low
Support and contribution	→	→	→	→	No material impacts identified.	Low
Education	→	→	→	→	No material impacts identified.	Low
Engagement and networks	→	↑	↑	↑	<p>Both schemes have a key role in wider regional water resources plans bringing together stakeholders from various sectors, including energy, retail, land management and agriculture. Discussions around concept design, construction planning and policies, risks and issues, and mitigation actions, involve engaging with key stakeholders such as water companies, the Environment Agency, Natural England, DEFRA, trusts and local authorities.</p> <p>SLR SRO ties in working closely with the South Lincolnshire Water Partnership (SLWP) and Integrated Adaptation Partnership.</p> <p>Community and customers were engaged early through a research programme developed to ensure transparency, build understanding, and gather feedback (captured within Trust and Reputation).</p> <p>Mitigation interventions will lead to extensive engagement with landowners, local authorities, and communities (e.g. habitat creation/enhancement aimed at achieving 10% net gain, eradication of INNS at Kingsbury Water Park (Japanese knotweed) etc.).</p> <p>At this stage of the SRO schemes, wider community, and stakeholder engagement (beyond EA and NE) has not been carried out, and therefore this has been assessed as Moderate.</p>	Moderate

Creativity	→	→	→	→	No material impacts identified.	Low
<b>Human capital</b>						
Jobs and training	→	↑	↑	↑	The schemes are likely to lead to job/training creation in the construction phase. Severn Trent Water confirmed that the Minworth SRO will result in one permanent full-time role on the site.  Further information is needed on whether operational phase is going to lead to new jobs created and training opportunities, including workshops or short-term employment such as internships or apprenticeships. As such, following discussions with relevant disciplines this has been categorised as Moderate – while a positive impact is anticipated, at this stage of the SRO schemes confirmed information is lacking.	Moderate
Health and safety	→	→	→	→	No material impacts identified.	Low
Equality, diversity, and inclusion	→	→	→	→	Further information is needed on whether the schemes are going to lead to the inclusion of local communities in long-term maintenance of natural spaces restored/created/enhanced through mitigation and specific initiatives for disabled people. Based on the limited information relating to this area, further work would be required to understand whether the schemes will have a material impact.	Low
Local economy	→	↑	↑	↑	For both Minworth and SLR SRO, given the nature of potential mitigation actions around the rivers Tame and Trent (biodiversity improvement and natural spaces enhancement), it is possible that it would lead to slight positive impacts on the local economy due to a potential increase in recreational activities and the number of visitors, if sites are turned into visitor destinations.  The corresponding increase in visitor numbers could potentially have an impact on the local economy if it in turn leads to higher levels of visitor expenditure and creates knock on benefits to businesses operating within the area.	Moderate
<b>Intellectual capital</b>						
Data assets	→	→	→	→	No material impacts identified.	Low
Research and development	→	↑	↑	↑	For both schemes, there is an opportunity to feed into the innovative online portal built by Water Resources West (and East) to gather quantitative and qualitative data to inform an ambitious multi-sector adaptive water resources plan.  While there may be some positive impacts, they are not considered highly material.	Moderate
Knowledge and learning	→	↑	↑	↑	Further information is needed on whether the Water Companies are intending to use the SRO schemes and potential mitigation interventions to deliver events to share knowledge and raise awareness about water sharing and restoration.  It is assumed that there will be opportunities for community engagement events for example, which would contribute to community knowledge and learning, and also for sharing of industry best practice.	Moderate
Processes and efficiency	→	→	→	→	No material impacts identified.	Low
<b>Manufactured capital</b>						
Resilience	→	↑/↓	↑/↓	↑/↓	The aim of the SRO schemes is to provide greater resilience in water supply in the long term, and to provide additional water quality treatment to support the transfers in the case of Minworth. The potential reduction of flows in the Rivers Tame and Trent is not considered significant in	Moderate

					terms of water supply and resources in the wider catchment, as such the impact on resilience is deemed moderate. Although it should be noted, consideration will be given to other abstractors and the Hands-off Flow (HoF) for example to avoid conflict of water supply and demand.	
Decommissioning	→	→	→	→	Given the temporal scope of this assessment is for 30 years, the decommissioning of the scheme sits outside of that time frame, as such the impact has been scoped out.	Low
Financial capital						
OPEX	→	↓	↓↓	↓↓	Ongoing management is likely to involve significant costs	High

## Measure and Value Stage: How?

### Step 05: Measure impact drivers and/or dependencies

3.3.10 Each capital metric scoped in from the materiality assessment is quantified and valued (where possible based on the availability of data) based on physical and monetary flows data as presented through the below impact pathway diagrams. The approach to valuing is articulated with reference to the receptors/beneficiaries and to an indicator of robustness using a **High-Moderate-Low** scoring system. The robustness is a function of both the quality of the methodology for estimating the value of the service (with market price considered the most robust) and the accuracy of the data available to support the valuation.

## Impact 1. Global Climate Regulation

Table 3-4. Impact-dependency pathway for global climate regulation

Impact-dependency pathway element	Description
<b>Activity</b>	Carbon benefits are likely to be delivered through mitigation measures, habitat creation and enhancement associated with each scheme scenario.
<b>Impact</b>	<ul style="list-style-type: none"> <li>Change in greenhouse gases entering the global atmosphere. Improvement in carbon sequestration from mitigation actions.</li> </ul>
<b>Receptor</b>	General public
<b>Physical flow data</b>	<ul style="list-style-type: none"> <li>Area of habitat types upstream to the SLR abstraction before and after effluent diverted from Minworth and mitigation actions implemented</li> <li>Area of habitat types downstream to the SLR abstraction before and after abstraction and mitigation actions implemented</li> <li>Area of habitat types downstream to the SLR abstraction before and after effluent diverted from Minworth and SLR abstraction combined together, and after mitigation actions implemented</li> </ul>
<b>Monetary flow data</b>	BEIS central non-traded carbon price
<b>Confidence</b>	<b>Moderate</b>

## Impact 2. Water quality

Table 3-5. Impact-dependency pathway for water quality

Impact-dependency pathway element	Description
<b>Activity</b>	Flow reduction caused by the combined SROs and mitigation actions leading to water quality improvement.
<b>Impact</b>	<ul style="list-style-type: none"> <li>Improvement in water quality in River Tame (Minworth Scenario)</li> <li>No change in water quality after SLR abstraction</li> <li>Overall improvement for combined scenarios</li> </ul>

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<b>Receptor</b>	Local residents and visitors
<b>Physical flow data</b>	<ul style="list-style-type: none"> <li>Length of river water to be improved in km</li> <li>Change in WFD classification</li> </ul>
<b>Monetary flow data</b>	NWEBS value per km of river water quality improved ( [REDACTED] per km in 2012 prices)
<b>Confidence</b>	<b>Moderate</b>

## Impact 3. Recreation

Table 3-6: Impact-dependency pathway for recreation

Impact-dependency pathway element	Description
<b>Activity</b>	Watercourses are essential for water sports, angling, and boating, and include many riparian footpaths and rights of way. Wetlands and green spaces also support a diversity of recreational uses including wildlife observation, nature study, freshwater fishing, etc. Mitigation options to obtain wider benefits and achieve 10% net gain in terms of habitat creation/enhancement are likely to provide further recreational benefits within the catchment. For instance, grassland and wet woodland enhancement, wetlands and reedbeds creation, and access path restoration will increase opportunities for walking, bird watching, water sports, picnic, and pond dipping facilities for local communities, etc. if made accessible to the public.
<b>Impact</b>	<ul style="list-style-type: none"> <li>Change in the number of people enjoying recreational activities on the site</li> </ul>
<b>Receptor</b>	Local residents and visitors
<b>Physical flow data</b>	<ul style="list-style-type: none"> <li>Estimated visitors and associated welfare value before and after effluent diverted from Minworth</li> <li>Estimated visitors and associated welfare value before and after SLR abstraction</li> </ul>
<b>Monetary flow data</b>	Average benefit to visitor for a recreational visit to freshwater and floodplain/wetlands habitats drawn from ORVaL
<b>Confidence</b>	<b>Low/Moderate</b>

## Impact 4. Biodiversity

Table 3-7: Impact-dependency pathway for biodiversity

Impact-dependency pathway element	Description
<b>Activity</b>	Mitigation actions to enhance priority habitats likely to be impacted by the flow reduction caused by the two SROs
<b>Impact</b>	<ul style="list-style-type: none"> <li>Change in the extent and condition of habitats resulting in a change in the number of biodiversity units</li> </ul>
<b>Receptor</b>	General public
<b>Physical flow data</b>	<ul style="list-style-type: none"> <li>Area and condition of habitat types before and after effluent diverted from Minworth and mitigation actions implemented</li> <li>Area and condition of habitat types before and after SLR abstraction and mitigation actions implemented</li> <li>Area and condition of habitat types before and after effluent diverted from Minworth combined with SLR abstraction and mitigation actions implemented</li> <li>Number of biodiversity units provided by habitats (calculated via Biodiversity Metric 3.0 in order to align with existing assessment)</li> </ul>
<b>Monetary flow data</b>	Average estimated cost per biodiversity credit from various online sources [REDACTED] per unit in 2018 prices)

<b>Confidence</b>	<b>Moderate</b>
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## Impact 5. OPEX

**Table 3-8: Impact-dependency pathway for OPEX**

Impact-dependency pathway element	Description
<b>Activity</b>	Cost of operations of the newly constructed assets on an annual basis, including labour, power and chemicals
<b>Impact</b>	<ul style="list-style-type: none"> <li>Financial costs incurred by Affinity Water, Anglian Water, Severn Trent Water</li> </ul>
<b>Receptor</b>	Affinity Water, Anglian Water, Severn Trent Water
<b>Physical flow data</b>	Total and annual OPEX costs for all four scenarios
<b>Monetary flow data</b>	Total and annual OPEX costs for all four scenarios
<b>Confidence</b>	<b>High</b>

### Step 06: Measure changes in the state of natural capital

3.3.11 Key to measuring changes in natural capital extent and condition pre- and post-enhancement are habitat type, area and condition. At this stage, habitat data is available for the '0 = do-nothing' scenario. As noted above post-development habitat data is not available due to the uncertainties of flow reductions as a result of the SRO proposals. Therefore, a baseline scenario has been presented with different scenarios for various habitat loss, creation, and enhancement options, based on a commitment to deliver 10% net gain. As set out in the BNG results in Section 3.3, the 10% net gain via the improvement of the conditions of the following habitat types:

- Coastal lagoons
- Saltmarshes and saline reedbeds
- Floodplain wetland mosaic (CFGM)
- Other neutral grassland
- Traditional orchards
- Intertidal sediment – Littoral mixed sediments
- Reedbeds
- Lowland mixed deciduous woodland
- Wet woodland

3.3.12 With no further evidence or information relating to specific changes to habitat type under scenarios 1, 2 and 3 the BNG outputs have been used as initial habitat data for the assessments of scenarios 1, 2 and 3. This assessment will need to be re-run once further information is available about the biodiversity mitigation measures associated with each scenario in Gate 3.

3.3.13 It is important to note that the BNG assessment at this stage focuses on changes in habitat condition, rather than changes in habitat type and their extent. This means that many of the natural capital valuation models, which are linked to changes in habitat type and extent rather than condition, are unable to be used to quantify the value of such changes, and as such, the same value is estimated

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across the scenarios. More detailed information on changes in habitat type and extent under the scenarios would allow more refined valuation estimates.

- 3.3.14 In relation to water quality, while baseline data is available for the study area, a natural capital assessment typically uses the changes in water quality to measure and value the impact to this ecosystem service. While the project is awaiting the result of water quality and WFD assessments, there is no data available on the change in water quality, as such the impacts on this ecosystem service cannot be measured at this stage.
- 3.3.15 The catchment wide spatial boundaries used to estimate the value of the provision of recreation from natural capital assets were not deemed suitable for this study. For instance, an estimate of the number of recreational visitors and value of this per year can be derived for the 'Witham Management catchment'. However, this spatial boundary is not representative of the study area and as such has not been included in the assessment, as this may risk being misleading in terms of understanding the current recreational provision as well as the change in provision experienced in scenarios 1, 2 and 3. Therefore, the values of recreation benefits from mitigation options were estimated using ORVal tool<sup>13</sup>. Several case studies were developed based on potential site creation within the targeted mitigation sites. Table 3.8 below shows the gains regarding the number of visitors (per year) and associated welfare values (£ per year) for each case study and in total.

**Table 3-9: Potential recreation gains from the hypothetical creation of Sites A, B, C and D**

	Number of visitors (per year)	Welfare values (£ per year)
Site A	365,240	
Site B	170,089	
Site C	42,220	
Site D	125,659	
<b>Total</b>	<b>703,208</b>	

- 3.3.16 The ORVal Calculations for the four hypothetical sites are based on a series of modelled habitat creation interventions focusing upon the restoration or creation of habitats within existing floodplain mosaic habitats.

### Site A

- 3.3.17 Site A is a small area of floodplain grassland/wetland mosaic. Additional creation of wet woodland and fen and wetland habitats within this site would result in an outdoor recreational value of [REDACTED]

### Site B

- 3.3.18 Site B comprises lowland mixed deciduous woodland and wet woodland set within a matrix of wetland mosaic habitats and high value fen. Modelled habitat creation including the creation of additional reedbed habitats within this site would result in an outdoor recreational value of the site of [REDACTED]

### Site C

- 3.3.19 Site C comprises expanses of floodplain mosaic with associated reedbed and high-quality grassland. Additional reedbed creation and grassland restoration within this site would result in an outdoor recreational value of [REDACTED]

### Site D

- 3.3.20 Site D comprises a floodplain mosaic dominated by high quality fen and reedbed habitats. The creation of additional lowland mixed deciduous woodland and reedbed within this site would result in an outdoor recreational value of [REDACTED].

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### Step 07: Value impacts and/or dependencies

- 3.3.21 The results of the valuation exercise are summarised in the table below. All values are presented in terms of a 30-year Present Value in 2020 prices and discounted with a 3.5% declining discount rate.
- 3.3.22 The total Present Value of the '0 – do-Nothing' scenario is estimated to be [REDACTED] million. This value is principally made up of the total stock of biodiversity units contained within the area.
- 3.3.23 None of the three scenarios were estimated to lead to a change in the global climate regulation service relative to the do-nothing scenario as there was no change in the extent of habitats within the scheme boundary, or the condition of peatland habitats.
- 3.3.24 It was not possible to value changes in water quality with the available data.
- 3.3.25 All scenarios were estimated to deliver an increase in recreational value relative to the do-nothing scenario although it was not possible to differentiate the impacts across the scenarios at this stage.
- 3.3.26 The biodiversity value was estimated to increase by around 3.5% for each of the three scenarios given the habitat mitigation measures likely to be applied (note, this is lower than the 10% gain in biodiversity units due to the discounting effect of values to be realised in future). There was no estimated difference in these measures across the three scenarios.
- 3.3.27 The OPEX costs are likely to be highest for the '3 – Minworth & SLR SROs' scenario and lowest for '1 – Minworth SRO'.
- 3.3.28 In total, given the metrics included within this assessment, all of the scenarios are estimated to lead to a decrease in value relative to the '0 – do-nothing' scenario aside from '1 – Minworth SRO'. This is due to the fact that the increases in biodiversity and recreation value are generally smaller than the expected OPEX costs, except for from '1 – Minworth SRO' which has a much lower operational cost.

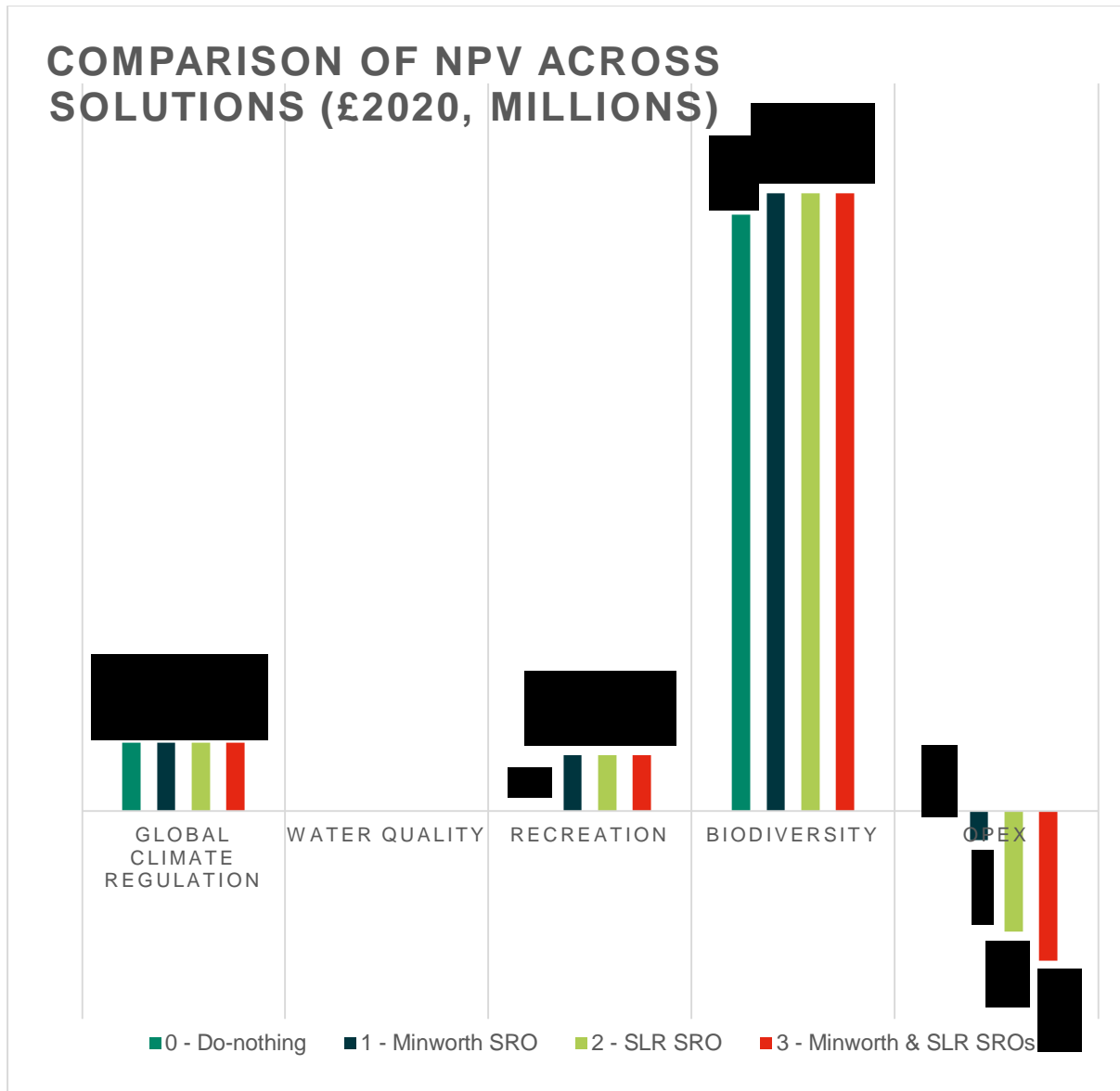
**Table 3-10: Breakdown of results from the assessment (£2020, millions)**

Option		0 - Do-nothing	1 - Minworth SRO	2 - SLR SRO	3 - Minworth & SLR SROs		
Code	Natural Capital	PV	PV	PV	PV	Value Type	Confidence
NC 13	Global climate regulation	[REDACTED]				External	Moderate
NC 16	Water quality					-	-
NC 21	Recreation					External	Low
NC 25	Biodiversity					External	Moderate
FC 2	OPEX					Private	High
	Net Present Value (£2020 millions)						
	Change in value relative to Do-nothing						

- 3.3.29 A summary of the results and the breakdown of the value provided by each scenario based on the material impacts are set out in Figure 3-6 below. However, when considering Table 3-9 and Figure 3-6 it should be noted that the limited data and information on each SRO scenario results in identical outcomes in relation to impacts where quantitative data is available (Global climate regulation and Biodiversity), with the main differentiator between the scenarios being the OPEX costs.

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Figure 3-6: Summary of results from the assessment



3.3.31 At this stage, it is not possible to present an overall summary because not all components could be assessed quantitatively. The findings therefore feed into recommendations for further assessment for Gate 3. The results will need to be updated with further assessments and when further information on scheme design and mitigation options becomes available.

3.3.32 As noted in the above sections, limitations on data availability and the scope of the four different SRO scenarios resulted in a number of high materiality ecosystem services not being quantified and valued. There are a number of assessments that are still on-going that would be critical in informing the evaluation of the impact on the remaining scoped in services, including:

- Engineering workstream carbon emissions assessment (outside the scope of this assessment); and
- Water quality and WFD assessments.

3.3.33 Additionally, to achieve a more detailed six capital assessment of the four scenarios; development of what scenarios 1, 2 and 3 look like in terms of mitigation measures, particularly in relation to terrestrial and aquatic habitat restoration and enhancement as well recreational facility improvements will be required.



- 3.3.34 Data from these ongoing surveys and assessments and a more detailed knowledge of the scenario outcomes will provide input that will allow the multi capitals assessment to be re-run in Gate 3 to provide a more accurate assessment of the four scenarios.

## **Apply Stage: What Next?**

### **Step 08: Interpret and test the results**

- 3.3.35 This step will be developed once the results of the final assessment are complete. Recommendations have been made for further refinement of the assessment as more information becomes available, i.e., beyond Gate 2 and into Gate 3.

### **Step 09: Take action**

- 3.3.36 This step will be developed once the results of the final assessment are complete.

## 3.4 Biodiversity Net Gain Results

### On-site Baseline Habitat Units

In total, the baseline biodiversity value of the habitats present within the study area was calculated as comprising a projected 101779.44 habitat units. Table 3-11 details biodiversity units by site, Table 3-12 details biodiversity units by habitat. Figure 1 in Annex A.2 of this report provides an illustration of the BNG habitat baseline.

**Table 3-11: Baseline Habitat Units per Site**

Site	Baseline Habitat Units
Alkborough Flats	7119.61
Attenborough Gravel Pits	3991.17
Besthorpe Meadows	253.06
Broad Meadow	451.10
Clifton Grove, Clifton Woods and Holme Pit Pond	692.95
Drakelow Reserve	629.08
Eon Meadows	461.15
Fledborough Holme	620.74
Humber Estuary	74999.09
Kingsbury Wetlands (Water Park)	3767.15
Ladywalk	718.79
Lea Marsh	760.60
Lea Marston Lake	1019.44
Lockington Confluence Backwater	111.42
Lockington Marshes	243.69
Netherfield	1190.28
River Derwent Mouth Lock	87.43
RSPB Middleton Lakes	2886.65
Sawley Carr	150.28
Shelford Carr	239.31
Sports Ground Marsh	32.34
Stanton Barn Marsh	39.77
Tameside	345.47
Trent Fleet	122.26
Trentside Ponds	60.70
Whitacre Heath	785.91
<b>Total</b>	<b>101779.44</b>

**Table 3-12: Baseline Habitat Units per Habitat**

Habitat (UKHab)	Habitat Units
Coastal lagoons - Coastal Lagoons	412.44
Coastal saltmarsh - Saltmarshes and saline reedbed	14691.55
Grassland - Floodplain Wetland Mosaic (CFGM)	59532.91
Grassland - Lowland calcareous grassland	0.00
Grassland - Lowland meadows	1834.01
Grassland - Other neutral grassland	265.10
Grassland - Traditional orchards	5.87
Intertidal sediment - Littoral mixed sediments	13460.01
Wetland - Fens (upland and lowland)	1999.35
Wetland - Reedbeds	5447.42
Woodland and forest - Lowland mixed deciduous woodland	2661.11
Woodland and forest - Wet Woodland	1469.67
Total	101779.44

## Post Impact Habitat Units and Biodiversity Net Gain

3.4.1 Tables 3-11 and 3-12 detail the baseline and modelled post development units for both sites and habitats. Based on enhancements to the condition of all moderate and high distinctiveness habitats present across the study area.

**Table 3-13: Post impact habitat units**

Site	Baseline Units	Post Impact Units	Net Unit Change	% BNG per site
Alkborough Flats	7119.61	7926.14	806.53	11.33
Attenborough Gravel Pits	3991.17	4426.72	435.54	10.91
Besthorpe Meadows	253.062	254.10	0.96	0.38
Broad Meadow	451.10	496.59	45.49	10.08
Clifton Grove, Clifton Woods and Holme Pit Pond	692.95	740.33	47.38	6.84
Drakelow Reserve	629.08	704.56	75.48	11.10
Eon Meadows	461.15	515.89	54.74	11.87
Fledborough Holme	620.74	620.74	0	0
Humber Estuary	74999.09	83626.37	8627.28	11.50
Kingsbury Wetlands (Water Park)	3767.15	4148.22	381.07	10.12
Ladywalk	718.79	795.77	76.98	10.71
Lea Marsh	760.60	760.60	0	0

Lea Marston Lake	1019.44	1185.86	166.42	16.32
Lockington Confluence Backwater	111.42	122.86	11.45	10.27
Lockington Marshes	243.69	253.03	9.35	3.84
Netherfield	1190.28	1300.40	110.12	9.25
River Derwent Mouth Lock	87.43	96.74	9.31	10.65
RSPB Middleton Lakes	2886.65	3175.48	288.83	10.01
Sawley Carr	150.28	159.49	9.21	6.13
Shelford Carr	239.31	291.67	52.36	21.88
Sports Ground Marsh	32.34	36.17	3.83	11.83
Stanton Barn Marsh	39.77	44.50	4.73	11.90
Tameside	345.47	387.41	41.94	12.14
Trent Fleet	122.26	136.86	14.60	11.94
Trentside Ponds	60.70	67.87	7.16	11.80
Whiteacre Heath	785.91	864.35	78.43	9.98

**Table 3-14: Post impact habitat types**

Habitats (UKHab)	Baseline Units	Post Impact Units	Net Unit Change	% BNG per Habitat
Coastal and floodplain grazing marsh	4257.49	4770.38	512.88	10.75
Coastal saltmarsh	13075.25	14301.71	1226.46	8.58
Deciduous woodland	2661.11	2784.06	122.94	4.42
Good quality semi- improved grassland	89.75	121.16	31.41	25.93
Lowland calcareous grassland	0.00	0.00	0.00	5.24
Lowland fens	1999.35	1999.35	0.00	0.00
Lowland Meadow	1773.84	1773.84	0.00	0.00
Marshy Grassland	175.36	236.73	61.37	25.93
Mudflat	13460.01	15200.53	1740.51	11.45
No main habitat but additional habitats present	3513.27	3936.50	423.23	10.75
Reedbed	5167.82	5747.43	579.61	10.08
Saline lagoons	412.44	460.35	47.92	10.41
Saltmarsh	1616.31	1767.91	151.61	8.58
Swamp	279.60	310.96	31.36	10.08
Traditional orchard	5.87	6.52	0.66	10.08

Wet Grassland	60.17	60.17	0.00	0.00
Wet Woodland	1469.67	1607.52	137.85	8.58
Wetland Mosaic	51762.15	58053.51	6291.36	10.84

## Delivering Biodiversity Net Gain

3.4.2 Table 3-13 below summarises the projected delivery of biodiversity net gain at the Gate 2 stage. Enhancing the baseline of 101779.44 habitat units by 11359.19 habitat units to a post impact value of 113138.63 delivers a modelled net gain of 11.16%.

3.4.3 Refer to Appendix B(i) Terrestrial Ecology for specific recommendations in terms of habitat creation and enhancement, and recommendations for further ecological surveys to inform this.

**Table 3-15: Biodiversity Net Gain Gate 2 Summary**

	Habitat Units
On-site baseline	101779.44
On-site Post-Intervention	113138.63
On-Site % Net Gain	11.16

# 4. Scoping Checklist – Recommendations and Mitigation Options

4.1.1 This section summarises the requirements for further assessment and mitigation beyond Gate 2.

**Table 4-1: Tame and Trent Strategic Resource Options – Scoping Checklist for post-Gate 2 assessment and mitigation**

Receptor or Feature under Assessment	Significance	Impact Pathway and Source (Minworth and/or SLR)	Scale of Impact (Positive / Neutral / Negative)	Red/Amber/Green rating of Risk to SRO (High / Medium / Low)	Recommendations for Further Assessment	Mitigation Options
<b>Non-Water Resources Impacts and Benefits</b>						
Tame and adjacent habitats	Local	Impacts from Minworth SRO on fisheries. Barriers to fish migration are unlikely to be exacerbated by the drop in water levels, meaning access to areas that are essential for key fish life stages are maintained (Refer to Aquatic Ecology assessment, Appendix B(ii)). Sedimentation accumulation at the riverbed is unlikely to be worsened, meaning that there will be no detriment for fish spawning, feeding and nursery habitats as well as for invertebrates and macrophytes, upon which fish depend (Refer to Sedimentation assessment, Appendix E).	Neutral	Low	Further assessments on fish passage, migratory species, and sedimentation to correlate with and understand the wider impacts on fish, looking at changes in stock and characteristics for each impacted species	Consider mitigation options to improve fish passage, as informed by further assessments.
Trent, Humber estuary, and adjacent habitats	Local	Impacts from SLR SRO on fisheries. Same as above	Neutral	Low	Same as above	Same as above

Receptor or Feature under Assessment	Significance	Impact Pathway and Source (Minworth and/or SLR)	Scale of Impact (Positive / Neutral / Negative)	Red/Amber/Green rating of Risk to SRO (High / Medium / Low)	Recommendations for Further Assessment	Mitigation Options
Tame and adjacent habitats	Local	<p>Impacts from Minworth SRO on water quality regulation.</p> <p>Minworth effluent is already treated to a good standard and may currently improve water quality in the Tame. However, not discharging the effluent from Minworth into the River Tame would remove residual phosphates and contaminants, contributing to water quality improvement.</p>	Neutral or Positive	Low	N/A	Not required
Tame and adjacent habitats	Local	<p>Impacts from Minworth SRO on disease and pest control.</p> <p>Impacts from Minworth SRO on disease and pest control.</p> <p>At Minworth, there is a very low risk of spread in margins widened by the flow reduction. However, given existing flow fluctuation and the prevalence of INNS in this location, this is not considered a significant impact.</p>	Neutral or Negative	Low	Refer to Appendix D INNS	See mitigation options in Appendix D INNS
Trent, Humber estuary, and adjacent habitats	Local	<p>Impacts from SLR SRO on disease and pest control.</p> <p>For SLR, there is a minor risk of INNS being transferred from the Trent to the River Witham, but mitigation should be incorporated to prevent this.</p>	Neutral or Negative	Low	Same as above	Same as above
Trent, Humber estuary, and adjacent habitats	Local	<p>Impacts from SLR SRO on recreation.</p> <p>It is not considered that there will be any loss of connectivity or fragmentation of aquatic habitats, and therefore there will be no negative impacts on fish of socio-economic importance, and no corresponding decrease in the value of angling activities.</p> <p>Mitigation options to obtain wider benefits and achieve 10% net gain in terms of habitat creation/enhancement are likely to provide recreation benefits.</p>	Positive	Low	ORVal could be used for Gate 3 quantitative assessment but more accurate data on the exact locations of recreation sites and on the number of visits is recommended for more truthful results.	The overall recreational value will be improved by targeted mitigation actions. Grassland and wet woodland enhancement, wetlands and reedbeds creation, and access path restoration will increase opportunities for walking, bird watching, water sports,

Receptor or Feature under Assessment	Significance	Impact Pathway and Source (Minworth and/or SLR)	Scale of Impact (Positive / Neutral / Negative)	Red/Amber/Green rating of Risk to SRO (High / Medium / Low)	Recommendations for Further Assessment	Mitigation Options
						picnic and pond dipping facilities for the local communities, etc.
Tame and adjacent habitats	Local	Impacts from Minworth SRO on trust and reputation. The potential negative impacts on INNS spread and on fish/angling clubs could erode public's trust in Affinity Water although this could be remediated with appropriate mitigation measures. Anglian Water, Affinity Water and Severn Trent customers views on the two SROs collected as part of a programme of customer engagement in the approach to Gate-1, showed a global support for 'sharing' water. However, for Minworth SRO, customers were concerned over a change in taste and water hardness.	Negative/Positive	Low	Collect customers and public feedback from further surveys that would aim to ask whether they are satisfied with decisions over SROs, considering the potential impacts and measures to address them. Assess the number of satisfied customers.	A potential decrease in public's trust would be mitigated with actions undertaken to minimise impacts on INNS spread and on recreation ( <i>captured above</i> ).
Trent, Humber estuary, and adjacent habitats		Impacts from SLR SRO on trust and reputation. Same as above. Although SLR is largely accepted as recreation and environmental benefits are seen to be outweighing the localised impacts, customers want to be informed in the context of other schemes.	Negative/Positive	Low	Same as above	Same as above
Tame and adjacent habitats		Impacts from Minworth SRO on engagement and networks. Minworth SRO has a key role in wider regional water resources plans bringing together stakeholders from various sectors, including energy, retail, land management and agriculture. Discussions around concept design, construction planning and policies, risks and issues, and mitigation actions, involve engaging with key stakeholders such as water companies, the Environment Agency, Natural	Positive	Low	Assess the number of partnerships created.	Not required



Receptor or Feature under Assessment	Significance	Impact Pathway and Source (Minworth and/or SLR)	Scale of Impact (Positive / Neutral / Negative)	Red/Amber/Green rating of Risk to SRO (High / Medium / Low)	Recommendations for Further Assessment	Mitigation Options
		<p>England, DEFRA, trusts and local authorities.</p> <p>Community and customers were engaged early through a research programme developed to ensure transparency, build understanding, and gather feedback. <i>(Captured within Trust and Reputation)</i></p>				
Trent, Humber estuary, and adjacent habitats		<p>Impacts from SLR SRO on engagement and networks.</p> <p>Same as above. SLR SRO ties in working closely with the South Lincolnshire Water Partnership (SLWP) and Integrated Adaptation Partnership</p>	Positive	Low	Same as above	Not required
Tame and adjacent habitats		<p>Impacts from Minworth SRO on engagement and networks.</p> <p>Given the nature of the potential mitigation actions around the river Tame (biodiversity improvement and natural spaces enhancement), it is possible that it would lead to slight positive impacts on the local economy due to a potential increase in recreational activities and the number of visitors.</p>	Positive	Low	Assess visitor expenditure	Develop plans to include facilities and amenities in the design of mitigation options to convert the created/enhanced sites into visitor destinations.

## **A.1 Annex A.1 Biodiversity Net Gain Metric 3.0: Tame\_Trent\_BNG\_Metric\_3.0\_D2**

Site Name	Habitat Type	UK Hab	BASELINE DATA											
			Area (ha)	Dscore	Distinctiveness	Cscore	Condition	SSscore	Strategic Significance	Pre Units	Area (ha)	Dscore	Distinctiveness	Cscore
Humber Estuary	Saline lagoons	Coastal lagoons - Coastal Lagoons	23.91	6	High	2.5	Fairly Good	1.15	High	412.44	23.91	6	High	3
Alkborough Flats	Coastal saltmarsh	Coastal saltmarsh - Saltmarshes and saline reedbed	0.22	6	High	2.5	Fairly Good	1.15	High	3.86	0.22	6	High	3
Alkborough Flats	Saltmarsh	Coastal saltmarsh - Saltmarshes and saline reedbed	46.86	6	High	2.5	Fairly Good	1.15	High	808.34	46.86	6	High	3
Humber Estuary	Coastal saltmarsh	Coastal saltmarsh - Saltmarshes and saline reedbed	757.76	6	High	2.5	Fairly Good	1.15	High	13071.39	757.76	6	High	3
Humber Estuary	Saltmarsh	Coastal saltmarsh - Saltmarshes and saline reedbed	46.84	6	High	2.5	Fairly Good	1.15	High	807.97	46.84	6	High	3
Alkborough Flats	Coastal and floodplain grazing marsh	Grassland - Floodplain Wetland Mosaic (CFGM)	107.12	6	High	2.5	Fairly Good	1.15	High	1847.78	107.12	6	High	3
Alkborough Flats	No main habitat but additional habitats present	Grassland - Floodplain Wetland Mosaic (CFGM)	4.18	6	High	2.5	Fairly Good	1.15	High	72.15	4.18	6	High	3
Alkborough Flats	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	52.26	6	High	2.5	Fairly Good	1.15	High	901.54	52.26	6	High	3
Attenborough Gravel Pits	No main habitat but additional habitats present	Grassland - Floodplain Wetland Mosaic (CFGM)	37.06	6	High	2.5	Fairly Good	1.15	High	639.34	37.06	6	High	3
Attenborough Gravel Pits	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	134.30	6	High	2.5	Fairly Good	1.15	High	2316.61	134.30	6	High	3
Besthorpe Meadows	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	0.46	6	High	2.5	Fairly Good	1.15	High	7.95	0.46	6	High	3
Broad Meadow	Coastal and floodplain grazing marsh	Grassland - Floodplain Wetland Mosaic (CFGM)	21.61	6	High	2.5	Fairly Good	1.15	High	372.84	21.61	6	High	3
Broad Meadow	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	0.28	6	High	2.5	Fairly Good	1.15	High	4.76	0.28	6	High	3
Clifton Grove, Clifton Woods and Holme Pit Pond	No main habitat but additional habitats present	Grassland - Floodplain Wetland Mosaic (CFGM)	1.16	6	High	2.5	Fairly Good	1.15	High	20.03	1.16	6	High	3
Clifton Grove, Clifton Woods and Holme Pit Pond	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	7.70	6	High	2.5	Fairly Good	1.15	High	132.86	7.70	6	High	3
Drakelow Reserve	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	34.34	6	High	2.5	Fairly Good	1.15	High	592.33	34.34	6	High	3
Eon Meadows	Coastal and floodplain grazing marsh	Grassland - Floodplain Wetland Mosaic (CFGM)	12.77	6	High	2.5	Fairly Good	1.15	High	220.24	12.77	6	High	3
Eon Meadows	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	8.36	6	High	2.5	Fairly Good	1.15	High	144.15	8.36	6	High	3
Humber Estuary	Coastal and floodplain grazing marsh	Grassland - Floodplain Wetland Mosaic (CFGM)	41.25	6	High	2.5	Fairly Good	1.15	High	711.61	41.25	6	High	3
Humber Estuary	No main habitat but additional habitats present	Grassland - Floodplain Wetland Mosaic (CFGM)	104.55	6	High	2.5	Fairly Good	1.15	High	1803.51	104.55	6	High	3
Humber Estuary	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	2441.84	6	High	2.5	Fairly Good	1.15	High	42121.82	2441.84	6	High	3
Kingsbury Wetlands (Water Park)	Coastal and floodplain grazing marsh	Grassland - Floodplain Wetland Mosaic (CFGM)	1.67	6	High	2.5	Fairly Good	1.15	High	28.77	1.67	6	High	3
Kingsbury Wetlands (Water Park)	No main habitat but additional habitats present	Grassland - Floodplain Wetland Mosaic (CFGM)	11.19	6	High	2.5	Fairly Good	1.15	High	193.09	11.19	6	High	3
Kingsbury Wetlands (Water Park)	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	132.79	6	High	2.5	Fairly Good	1.15	High	2290.69	132.79	6	High	3
Ladywalk	Coastal and floodplain grazing marsh	Grassland - Floodplain Wetland Mosaic (CFGM)	0.39	6	High	2.5	Fairly Good	1.15	High	6.77	0.39	6	High	3
Ladywalk	No main habitat but additional habitats present	Grassland - Floodplain Wetland Mosaic (CFGM)	2.30	6	High	2.5	Fairly Good	1.15	High	39.62	2.30	6	High	3
Ladywalk	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	14.66	6	High	2.5	Fairly Good	1.15	High	252.81	14.66	6	High	3
Lea Marston Lake	No main habitat but additional habitats present	Grassland - Floodplain Wetland Mosaic (CFGM)	0.59	6	High	2.5	Fairly Good	1.15	High	10.18	0.59	6	High	3
Lea Marston Lake	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	50.99	6	High	2.5	Fairly Good	1.15	High	879.58	55.61	6	High	3
Lockington Confluence Backwater	Coastal and floodplain grazing marsh	Grassland - Floodplain Wetland Mosaic (CFGM)	1.85	6	High	2.5	Fairly Good	1.15	High	31.90	1.85	6	High	3
Lockington Confluence Backwater	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	0.24	6	High	2.5	Fairly Good	1.15	High	4.19	0.24	6	High	3
Lockington Marshes	Coastal and floodplain grazing marsh	Grassland - Floodplain Wetland Mosaic (CFGM)	0.18	6	High	2.5	Fairly Good	1.15	High	3.08	0.18	6	High	3
Lockington Marshes	No main habitat but additional habitats present	Grassland - Floodplain Wetland Mosaic (CFGM)	1.57	6	High	2.5	Fairly Good	1.15	High	27.03	1.57	6	High	3
Lockington Marshes	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	0.86	6	High	2.5	Fairly Good	1.15	High	14.91	0.86	6	High	3
Netherfield	No main habitat but additional habitats present	Grassland - Floodplain Wetland Mosaic (CFGM)	4.89	6	High	2.5	Fairly Good	1.15	High	84.43	4.89	6	High	3
Netherfield	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	41.02	6	High	2.5	Fairly Good	1.15	High	707.67	41.02	6	High	3
River Derwent Mouth Lock	No main habitat but additional habitats present	Grassland - Floodplain Wetland Mosaic (CFGM)	0.71	6	High	2.5	Fairly Good	1.15	High	12.24	0.71	6	High	3
River Derwent Mouth Lock	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	1.29	6	High	2.5	Fairly Good	1.15	High	22.22	1.29	6	High	3
RSPB Middleton Lakes	Coastal and floodplain grazing marsh	Grassland - Floodplain Wetland Mosaic (CFGM)	31.90	6	High	2.5	Fairly Good	1.15	High	550.34	31.90	6	High	3
RSPB Middleton Lakes	No main habitat but additional habitats present	Grassland - Floodplain Wetland Mosaic (CFGM)	30.87	6	High	2.5	Fairly Good	1.15	High	532.50	30.87	6	High	3
RSPB Middleton Lakes	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	64.09	6	High	2.5	Fairly Good	1.15	High	1105.47	64.09	6	High	3
Sawley Carr	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	0.49	6	High	2.5	Fairly Good	1.15	High	8.49	0.49	6	High	3
Sports Ground Marsh	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	1.38	6	High	2.5	Fairly Good	1.15	High	23.83	1.38	6	High	3
Stanton Barn Marsh	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	1.91	6	High	2.5	Fairly Good	1.15	High	32.93	1.91	6	High	3
Tameside	Coastal and floodplain grazing marsh	Grassland - Floodplain Wetland Mosaic (CFGM)	12.19	6	High	2.5	Fairly Good	1.15	High	210.34	12.19	6	High	3
Tameside	No main habitat but additional habitats present	Grassland - Floodplain Wetland Mosaic (CFGM)	4.09	6	High	2.5	Fairly Good	1.15	High	70.55	4.09	6	High	3
Tameside	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	3.18	6	High	2.5	Fairly Good	1.15	High	54.84	3.18	6	High	3
Trent Fleet	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	6.18	6	High	2.5	Fairly Good	1.15	High	106.59	6.18	6	High	3
Trentside Ponds	Coastal and floodplain grazing marsh	Grassland - Floodplain Wetland Mosaic (CFGM)	1.25	6	High	2.5	Fairly Good	1.15	High	21.60	1.25	6	High	3
Trentside Ponds	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	1.50	6	High	2.5	Fairly Good	1.15	High	25.88	1.50	6	High	3
Whiteacre Heath	Coastal and floodplain grazing marsh	Grassland - Floodplain Wetland Mosaic (CFGM)	14.62	6	High	2.5	Fairly Good	1.15	High	252.22	14.62	6	High	3
Whiteacre Heath	No main habitat but additional habitats present	Grassland - Floodplain Wetland Mosaic (CFGM)	0.50	6	High	2.5	Fairly Good	1.15	High	8.60	0.50	6	High	3
Whiteacre Heath	Wetland Mosaic	Grassland - Floodplain Wetland Mosaic (CFGM)	0.58	6	High	2.5	Fairly Good	1.15	High	10.05	0.58	6	High	3
Alkborough Flats	Lowland calcareous grassland	Grassland - Lowland calcareous grassland	0.00	6	High	2.5	Fairly Good	1.15	High	0.00	0.00	6	High	3
Humber Estuary	Traditional orchard	Grassland - Traditional orchards	0.13	6	High	2.5	Fairly Good	1.15	High	2.24	0.13	6	High	3
Lea Marston Lake	Traditional orchard	Grassland - Traditional orchards	0.21	6	High	2.5	Fairly Good	1.15	High	3.62	0.21	6	High	3
Humber Estuary	Mudflat	Intertidal sediment - Littoral mixed sediments	780.29	6	High	2.5	Fairly Good	1.15	High	13460.01	780.29	6	High	3
Alkborough Flats	Reedbed	Wetland - Reedbeds	201.62	6	High	2.5	Fairly Good	1.15	High	3477.99	201.62	6	High	3
Attenborough Gravel Pits	Reedbed	Wetland - Reedbeds	7.57	6	High	2.5	Fairly Good	1.15	High	130.50	7.57	6	High	3
Drakelow Reserve	Reedbed	Wetland - Reedbeds	2.13	6	High	2.5	Fairly Good	1.15	High	36.75	2.13	6	High	3
Eon Meadows	Swamp	Wetland - Reedbeds	5.60	6	High	2.5	Fairly Good	1.15	High	96.62	5.60	6	High	3
Humber Estuary	Reedbed	Wetland - Reedbeds	69.78	6	High	2.5	Fairly Good	1.15	High	1203.79	69.78	6	High	3
Kingsbury Wetlands (Water Park)	Swamp	Wetland - Reedbeds	1.56	6	High	2.5	Fairly Good	1.15	High	26.88	1.56	6	High	3
Ladywalk	Reedbed	Wetland - Reedbeds	4.75	6	High	2.5	Fairly Good	1.15	High	81.91	4.75	6	High	3
Ladywalk	Swamp	Wetland - Reedbeds	1.13	6	High	2.5	Fairly Good	1.15	High	19.47	1.13	6	High	3

Lockington Confluence Backwater	Reedbed	Wetland - Reedbeds	0.85	6	High	2.5	Fairly Good	1.15	High	14.72	0.85	6	High	3
Lockington Confluence Backwater	Swamp	Wetland - Reedbeds	1.90	6	High	2.5	Fairly Good	1.15	High	32.75	1.90	6	High	3
Lockington Marshes	Reedbed	Wetland - Reedbeds	0.05	6	High	2.5	Fairly Good	1.15	High	0.80	0.05	6	High	3
Netherfield	Reedbed	Wetland - Reedbeds	4.98	6	High	2.5	Fairly Good	1.15	High	85.94	4.98	6	High	3
River Derwent Mouth Lock	Swamp	Wetland - Reedbeds	0.94	6	High	2.5	Fairly Good	1.15	High	16.23	0.94	6	High	3
RSPB Middleton Lakes	Reedbed	Wetland - Reedbeds	7.10	6	High	2.5	Fairly Good	1.15	High	122.55	7.10	6	High	3
Sawley Carr	Swamp	Wetland - Reedbeds	0.61	6	High	2.5	Fairly Good	1.15	High	10.61	0.61	6	High	3
Sports Ground Marsh	Swamp	Wetland - Reedbeds	0.49	6	High	2.5	Fairly Good	1.15	High	8.51	0.49	6	High	3
Stanton Barn Marsh	Swamp	Wetland - Reedbeds	0.40	6	High	2.5	Fairly Good	1.15	High	6.84	0.40	6	High	3
Tameside	Swamp	Wetland - Reedbeds	0.29	6	High	2.5	Fairly Good	1.15	High	5.07	0.29	6	High	3
Trent Fleet	Swamp	Wetland - Reedbeds	0.91	6	High	2.5	Fairly Good	1.15	High	15.67	0.91	6	High	3
Trentside Ponds	Reedbed	Wetland - Reedbeds	0.75	6	High	2.5	Fairly Good	1.15	High	12.89	0.75	6	High	3
Whiteacre Heath	Swamp	Wetland - Reedbeds	2.37	6	High	2.5	Fairly Good	1.15	High	40.96	2.37	6	High	3
Alkborough Flats	Deciduous woodland	Woodland and forest - Lowland mixed deciduous woodland	0.46	6	High	2.5	Fairly Good	1.15	High	7.96	0.46	6	High	3
Attenborough Gravel Pits	Deciduous woodland	Woodland and forest - Lowland mixed deciduous woodland	13.73	6	High	2.5	Fairly Good	1.15	High	236.77	13.73	6	High	3
Clifton Grove, Clifton Woods and Holme Pit Pond	Deciduous woodland	Woodland and forest - Lowland mixed deciduous woodland	25.95	6	High	2.5	Fairly Good	1.15	High	447.61	25.95	6	High	3
Eon Meadows	Deciduous woodland	Woodland and forest - Lowland mixed deciduous woodland	0.01	6	High	2.5	Fairly Good	1.15	High	0.14	0.01	6	High	3
Humber Estuary	Deciduous woodland	Woodland and forest - Lowland mixed deciduous woodland	13.92	6	High	2.5	Fairly Good	1.15	High	240.09	13.92	6	High	3
Kingsbury Wetlands (Water Park)	Deciduous woodland	Woodland and forest - Lowland mixed deciduous woodland	64.33	6	High	2.5	Fairly Good	1.15	High	1109.71	64.33	6	High	3
Ladywalk	Deciduous woodland	Woodland and forest - Lowland mixed deciduous woodland	6.99	6	High	2.5	Fairly Good	1.15	High	120.62	6.99	6	High	3
Lea Marston Lake	Deciduous woodland	Woodland and forest - Lowland mixed deciduous woodland	3.82	6	High	2.5	Fairly Good	1.15	High	65.90	3.82	6	High	3
Lockington Marshes	Deciduous woodland	Woodland and forest - Lowland mixed deciduous woodland	3.08	6	High	2.5	Fairly Good	1.15	High	53.09	3.08	6	High	3
Netherfield	Deciduous woodland	Woodland and forest - Lowland mixed deciduous woodland	6.34	6	High	2.5	Fairly Good	1.15	High	109.44	6.34	6	High	3
River Derwent Mouth Lock	Deciduous woodland	Woodland and forest - Lowland mixed deciduous woodland	0.03	6	High	2.5	Fairly Good	1.15	High	0.50	0.03	6	High	3
RSPB Middleton Lakes	Deciduous woodland	Woodland and forest - Lowland mixed deciduous woodland	14.38	6	High	2.5	Fairly Good	1.15	High	248.01	14.38	6	High	3
Sawley Carr	Deciduous woodland	Woodland and forest - Lowland mixed deciduous woodland	0.18	6	High	2.5	Fairly Good	1.15	High	3.14	0.18	6	High	3
Tameside	Deciduous woodland	Woodland and forest - Lowland mixed deciduous woodland	0.13	6	High	2.5	Fairly Good	1.15	High	2.32	0.13	6	High	3
Whiteacre Heath	Deciduous woodland	Woodland and forest - Lowland mixed deciduous woodland	0.92	6	High	2.5	Fairly Good	1.15	High	15.82	0.92	6	High	3
Attenborough Gravel Pits	Wet Woodland	Woodland and forest - Wet Woodland	33.30	6	High	2.5	Fairly Good	1.15	High	574.38	33.30	6	High	3
Clifton Grove, Clifton Woods and Holme Pit Pond	Wet Woodland	Woodland and forest - Wet Woodland	5.12	6	High	2.5	Fairly Good	1.15	High	88.27	5.12	6	High	3
Kingsbury Wetlands (Water Park)	Wet Woodland	Woodland and forest - Wet Woodland	3.82	6	High	2.5	Fairly Good	1.15	High	65.95	3.82	6	High	3
Ladywalk	Wet Woodland	Woodland and forest - Wet Woodland	10.22	6	High	2.5	Fairly Good	1.15	High	176.30	10.22	6	High	3
Lockington Confluence Backwater	Wet Woodland	Woodland and forest - Wet Woodland	1.10	6	High	2.5	Fairly Good	1.15	High	18.95	1.10	6	High	3
Lockington Marshes	Wet Woodland	Woodland and forest - Wet Woodland	0.85	6	High	2.5	Fairly Good	1.15	High	14.73	0.85	6	High	3
River Derwent Mouth Lock	Wet Woodland	Woodland and forest - Wet Woodland	2.05	6	High	2.5	Fairly Good	1.15	High	35.38	2.05	6	High	3
Sawley Carr	Wet Woodland	Woodland and forest - Wet Woodland	4.23	6	High	2.5	Fairly Good	1.15	High	73.04	4.23	6	High	3
Shelford Carr	Wet Woodland	Woodland and forest - Wet Woodland	7.10	6	High	2.5	Fairly Good	1.15	High	122.55	7.10	6	High	3
Whiteacre Heath	Wet Woodland	Woodland and forest - Wet Woodland	17.40	6	High	2.5	Fairly Good	1.15	High	300.13	17.40	6	High	3
Alkborough Flats	Good quality semi-improved grassland	Grassland - Other neutral grassland	0.00	4	Medium	2	Moderate	1.15	High	0.00	0.00	4	Medium	3
Humber Estuary	Good quality semi-improved grassland	Grassland - Other neutral grassland	4.15	4	Medium	2	Moderate	1.15	High	38.21	4.15	4	Medium	3
Kingsbury Wetlands (Water Park)	Good quality semi-improved grassland	Grassland - Other neutral grassland	5.57	4	Medium	2	Moderate	1.15	High	51.22	5.57	4	Medium	3
Ladywalk	Marshy Grassland	Grassland - Other neutral grassland	2.32	4	Medium	2	Moderate	1.15	High	21.30	2.32	4	Medium	3
RSPB Middleton Lakes	Good quality semi-improved grassland	Grassland - Other neutral grassland	0.00	4	Medium	2	Moderate	1.15	High	0.04	0.00	4	Medium	3
Shelford Carr	Marshy Grassland	Grassland - Other neutral grassland	12.69	4	Medium	2	Moderate	1.15	High	116.76	12.69	4	Medium	3
Tameside	Good quality semi-improved grassland	Grassland - Other neutral grassland	0.03	4	Medium	2	Moderate	1.15	High	0.27	0.03	4	Medium	3
Tameside	Marshy Grassland	Grassland - Other neutral grassland	0.23	4	Medium	2	Moderate	1.15	High	2.08	0.23	4	Medium	3
Whiteacre Heath	Marshy Grassland	Grassland - Other neutral grassland	3.83	4	Medium	2	Moderate	1.15	High	35.22	3.83	4	Medium	3
Attenborough Gravel Pits	Lowland Meadow	Grassland - Lowland meadows	2.65	8	V.High	3	Good	1.15	High	73.06	2.65	8	V.High	3
Besthorpe Meadows	Lowland Meadow	Grassland - Lowland meadows	8.88	8	V.High	3	Good	1.15	High	245.11	8.88	8	V.High	3
Broad Meadow	Lowland Meadow	Grassland - Lowland meadows	2.66	8	V.High	3	Good	1.15	High	73.50	2.66	8	V.High	3
Fledborough Holme	Lowland Meadow	Grassland - Lowland meadows	22.49	8	V.High	3	Good	1.15	High	620.74	22.49	8	V.High	3
Kingsbury Wetlands (Water Park)	Lowland Meadow	Grassland - Lowland meadows	0.03	8	V.High	3	Good	1.15	High	0.83	0.03	8	V.High	3
Lea Marsh	Lowland Meadow	Grassland - Lowland meadows	27.56	8	V.High	3	Good	1.15	High	760.60	27.56	8	V.High	3
Lea Marston Lake	Wet Grassland	Grassland - Lowland meadows	2.18	8	V.High	3	Good	1.15	High	60.17	2.18	8	V.High	3
Attenborough Gravel Pits	Lowland fens	Wetland - Fens (upland and lowland)	0.74	8	V.High	3	Good	1.15	High	20.51	0.74	8	V.High	3
Clifton Grove, Clifton Woods and Holme Pit Pond	Lowland fens	Wetland - Fens (upland and lowland)	0.15	8	V.High	3	Good	1.15	High	4.19	0.15	8	V.High	3
Humber Estuary	Lowland fens	Wetland - Fens (upland and lowland)	40.80	8	V.High	3	Good	1.15	High	1126.00	40.80	8	V.High	3
Lockington Confluence Backwater	Lowland fens	Wetland - Fens (upland and lowland)	0.32	8	V.High	3	Good	1.15	High	8.92	0.32	8	V.High	3
Lockington Marshes	Lowland fens	Wetland - Fens (upland and lowland)	4.71	8	V.High	3	Good	1.15	High	130.06	4.71	8	V.High	3
Netherfield	Lowland fens	Wetland - Fens (upland and lowland)	7.35	8	V.High	3	Good	1.15	High	202.80	7.35	8	V.High	3
River Derwent Mouth Lock	Lowland fens	Wetland - Fens (upland and lowland)	0.03	8	V.High	3	Good	1.15	High	0.86	0.03	8	V.High	3
RSPB Middleton Lakes	Lowland fens	Wetland - Fens (upland and lowland)	11.87	8	V.High	3	Good	1.15	High	327.74	11.87	8	V.High	3
Sawley Carr	Lowland fens	Wetland - Fens (upland and lowland)	1.99	8	V.High	3	Good	1.15	High	55.01	1.99	8	V.High	3
Trentside Ponds	Lowland fens	Wetland - Fens (upland and lowland)	0.01	8	V.High	3	Good	1.15	High	0.34	0.01	8	V.High	3
Whiteacre Heath	Lowland fens	Wetland - Fens (upland and lowland)	4.45	8	V.High	3	Good	1.15	High	122.92	4.45	8	V.High	3
										Total	101779.44			
										10% target	10177.94			

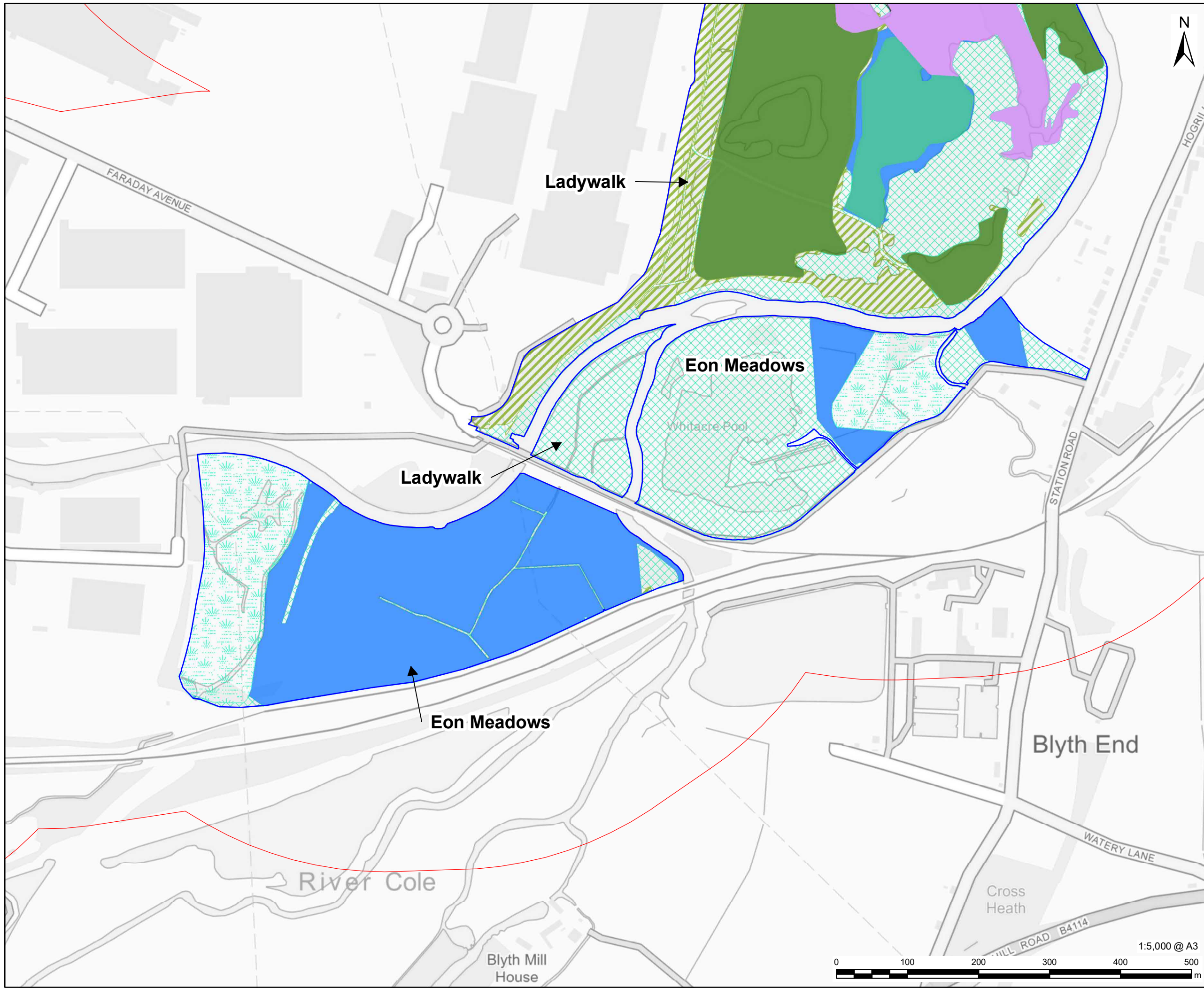
POST ENHANCEMENT DATA											Net Change	% Change
Condition	SSscore	Strategic Significance	TTTCscore	Time to Target Condition (yrs)	DifScore	Difficulty	SRScore	Spatial Risk	Post Units			
Good	1.15	High	0.867	4	0.67	Medium	0	na	460.35	47.92	11.62	
Good	1.15	High	0.700	10	0.67	Medium	0	na	4.22	0.36	9.38	
Good	1.15	High	0.700	10	0.67	Medium	0	na	884.16	75.82	9.38	
Good	1.15	High	0.700	10	0.67	Medium	0	na	14297.49	1226.10	9.38	
Good	1.15	High	0.700	10	0.67	Medium	0	na	883.75	75.79	9.38	
Good	1.15	High	0.899	3	0.67	Medium	0	na	2070.37	222.59	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	80.84	8.69	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	1010.14	108.60	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	716.36	77.02	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	2595.69	279.07	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	8.90	0.96	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	417.76	44.91	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	5.33	0.57	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	22.45	2.41	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	148.86	16.00	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	663.69	71.36	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	246.77	26.53	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	161.52	17.37	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	797.34	85.73	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	2020.77	217.26	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	47196.06	5074.25	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	32.24	3.47	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	216.36	23.26	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	2566.64	275.95	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	7.59	0.82	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	44.40	4.77	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	283.26	30.45	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	11.40	1.23	12.05	
Good	1.15	High	0.889	3	0.67	Medium	0	na	1041.32	161.74	18.39	
Good	1.15	High	0.899	3	0.67	Medium	0	na	35.74	3.84	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	4.69	0.50	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	3.45	0.37	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	30.28	3.26	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	16.70	1.80	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	94.60	10.17	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	792.92	85.25	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	13.71	1.47	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	24.90	2.68	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	616.64	66.30	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	596.65	64.15	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	1238.64	133.17	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	9.51	1.02	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	26.70	2.87	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	36.89	3.97	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	235.68	25.34	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	79.05	8.50	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	61.44	6.61	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	119.43	12.84	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	24.20	2.60	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	29.00	3.12	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	282.61	30.38	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	9.64	1.04	12.05	
Good	1.15	High	0.899	3	0.67	Medium	0	na	11.26	1.21	12.05	
Good	1.15	High	0.837	5	0.33	High	0	na	0.00	0.00	5.52	
Good	1.15	High	0.837	5	0.67	Medium	0	na	2.50	0.25	11.22	
Good	1.15	High	0.837	5	0.67	Medium	0	na	4.03	0.41	11.22	
Good	1.15	High	0.965	1	0.67	Medium	0	na	15200.53	1740.51	12.93	
Good	1.15	High	0.837	5	0.67	Medium	0	na	3868.07	390.08	11.22	
Good	1.15	High	0.837	5	0.67	Medium	0	na	145.14	14.64	11.22	
Good	1.15	High	0.837	5	0.67	Medium	0	na	40.87	4.12	11.22	
Good	1.15	High	0.837	5	0.67	Medium	0	na	107.46	10.84	11.22	
Good	1.15	High	0.837	5	0.67	Medium	0	na	1338.80	135.01	11.22	
Good	1.15	High	0.837	5	0.67	Medium	0	na	29.89	3.01	11.22	
Good	1.15	High	0.837	5	0.67	Medium	0	na	91.10	9.19	11.22	
Good	1.15	High	0.837	5	0.67	Medium	0	na	21.65	2.18	11.22	

Good	1.15	High	0.837	5	0.67	Medium	0	na	16.37	1.65	11.22
Good	1.15	High	0.837	5	0.67	Medium	0	na	36.42	3.67	11.22
Good	1.15	High	0.837	5	0.67	Medium	0	na	0.89	0.09	11.22
Good	1.15	High	0.837	5	0.67	Medium	0	na	95.58	9.64	11.22
Good	1.15	High	0.837	5	0.67	Medium	0	na	18.05	1.82	11.22
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Good	1.15	High	0.837	5	0.67	Medium	0	na	14.33	1.45	11.22
Good	1.15	High	0.837	5	0.67	Medium	0	na	45.56	4.59	11.22
Good	1.15	High	0.700	10	0.33	High	0	na	8.33	0.37	4.62
Good	1.15	High	0.700	10	0.33	High	0	na	247.71	10.94	4.62
Good	1.15	High	0.700	10	0.33	High	0	na	468.29	20.68	4.62
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Good	1.15	High	0.700	10	0.33	High	0	na	3.29	0.15	4.62
Good	1.15	High	0.700	10	0.33	High	0	na	2.43	0.11	4.62
Good	1.15	High	0.700	10	0.33	High	0	na	16.55	0.73	4.62
Good	1.15	High	0.700	10	0.67	Medium	0	na	628.26	53.88	9.38
Good	1.15	High	0.700	10	0.67	Medium	0	na	96.55	8.28	9.38
Good	1.15	High	0.700	10	0.67	Medium	0	na	72.14	6.19	9.38
Good	1.15	High	0.700	10	0.67	Medium	0	na	192.83	16.54	9.38
Good	1.15	High	0.700	10	0.67	Medium	0	na	20.72	1.78	9.38
Good	1.15	High	0.700	10	0.67	Medium	0	na	16.11	1.38	9.38
Good	1.15	High	0.700	10	0.67	Medium	0	na	38.70	3.32	9.38
Good	1.15	High	0.700	10	0.67	Medium	0	na	79.89	6.85	9.38
Good	1.15	High	0.700	10	0.67	Medium	0	na	134.04	11.49	9.38
Good	1.15	High	0.700	10	0.67	Medium	0	na	328.28	28.15	9.38
Good	1.15	High	0.700	10	1	Low	0	na	0.00	0.00	35.00
Good	1.15	High	0.700	10	1	Low	0	na	51.58	13.37	35.00
Good	1.15	High	0.700	10	1	Low	0	na	69.15	17.93	35.00
Good	1.15	High	0.700	10	1	Low	0	na	28.76	7.46	35.00
Good	1.15	High	0.700	10	1	Low	0	na	0.05	0.01	35.00
Good	1.15	High	0.700	10	1	Low	0	na	157.63	40.87	35.00
Good	1.15	High	0.700	10	1	Low	0	na	0.37	0.10	35.00
Good	1.15	High	0.700	10	1	Low	0	na	2.81	0.73	35.00
Good	1.15	High	0.700	10	1	Low	0	na	47.54	12.33	35.00
Good	1.15	High	0.000	na	0	na	0	na	73.06	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	245.11	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	73.50	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	620.74	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	0.83	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	760.60	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	60.17	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	20.51	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	4.19	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	1126.00	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	8.92	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	130.06	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	202.80	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	0.86	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	327.74	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	55.01	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	0.34	0.00	0.00
Good	1.15	High	0.000	na	0	na	0	na	122.92	0.00	0.00

113138.63 11359.19 11.16

## **A.2 Annex A.2: Figure 1 Biodiversity Net Gain Baseline**





# AECOM

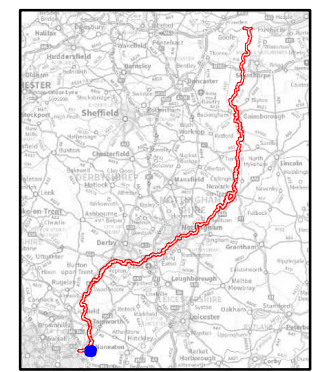
**PROJECT**  
Tame Trent and Humber  
Hydrology, Ecology and  
Environment C-03640

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**LEGEND**

	Wetland Habitat Study Area
	500m Study Area
	Coastal and Floodplain Grazing Marsh
	Deciduous Woodland
	Reedbed
	Swamp
	Wet Grassland
	Wet Woodland
	Wetland Mosaic
	No Main Habitat But Additional Habitats Present



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**ISSUE PURPOSE**

FINAL

**PROJECT NUMBER**

60641557

**FIGURE TITLE**

Biodiversity Net Gain Baseline:  
Eon Meadows: Whitacre Flood Meadow & Whitacre Pool (LWS)

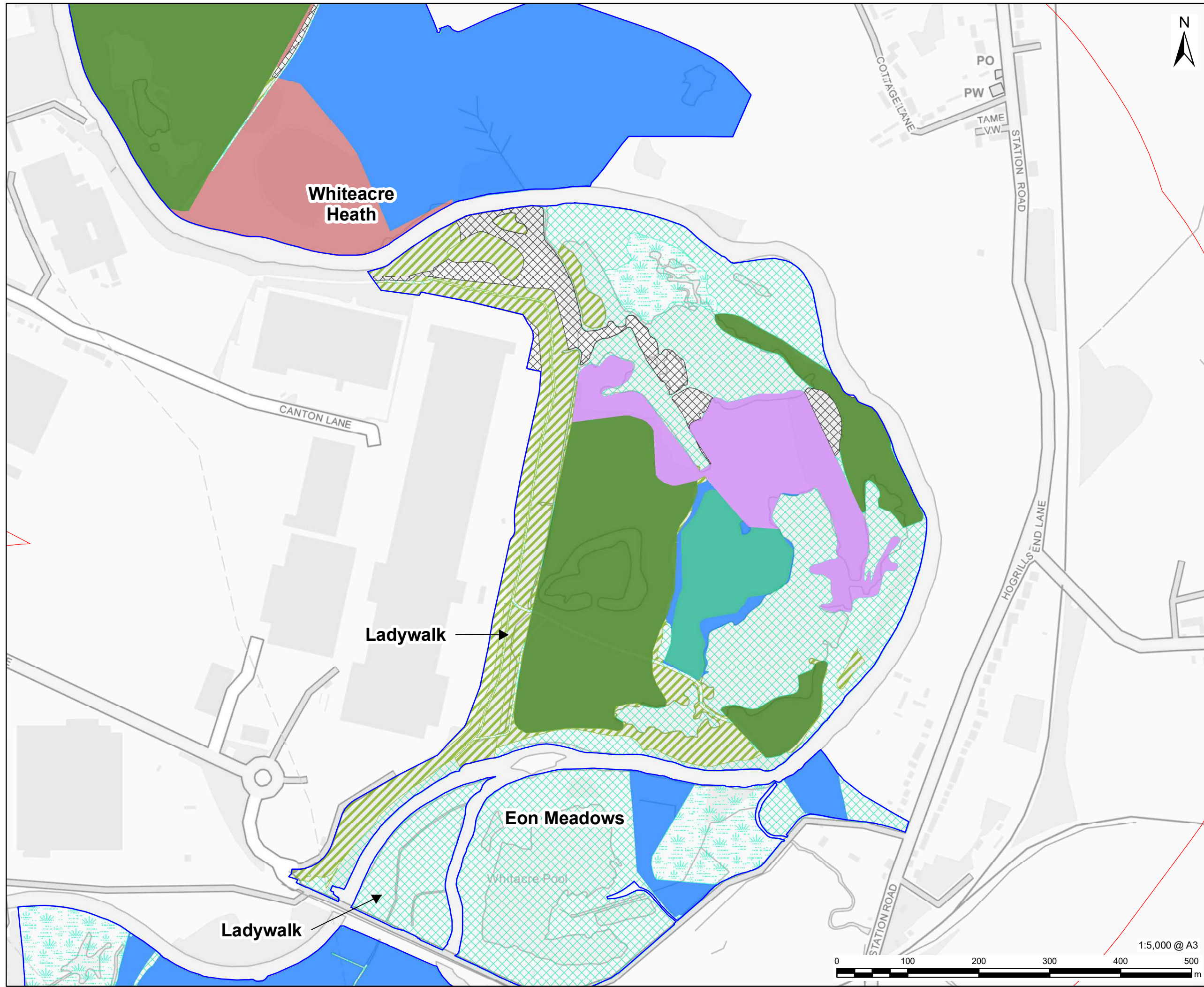
**FIGURE NUMBER**

Figure 1 - Sheet 1 of 27



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# AECOM

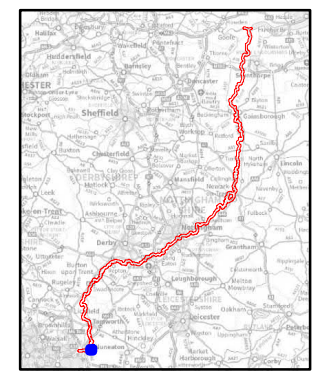
**PROJECT**  
Tame Trent and Humber  
Hydrology, Ecology and  
Environment C-03640

**CLIENT**  
Affinity Water

**CONSULTANT**  
AECOM Limited  
Midpoint,  
Alencon Link  
Basingstoke, RG21 7PP  
www.aecom.com

**LEGEND**

- Wetland Habitat Study Area
- 500m Study Area
- Coastal and Floodplain Grazing Marsh
- Deciduous Woodland
- Lowland Fens
- Reedbed
- Swamp
- Wet Grassland
- Wet Woodland
- Wetland Mosaic
- No Main Habitat But Additional Habitats Present



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**ISSUE PURPOSE**

FINAL

**PROJECT NUMBER**

60641557

**FIGURE TITLE**

Biodiversity Net Gain Baseline:  
Ladywalk (LWS)

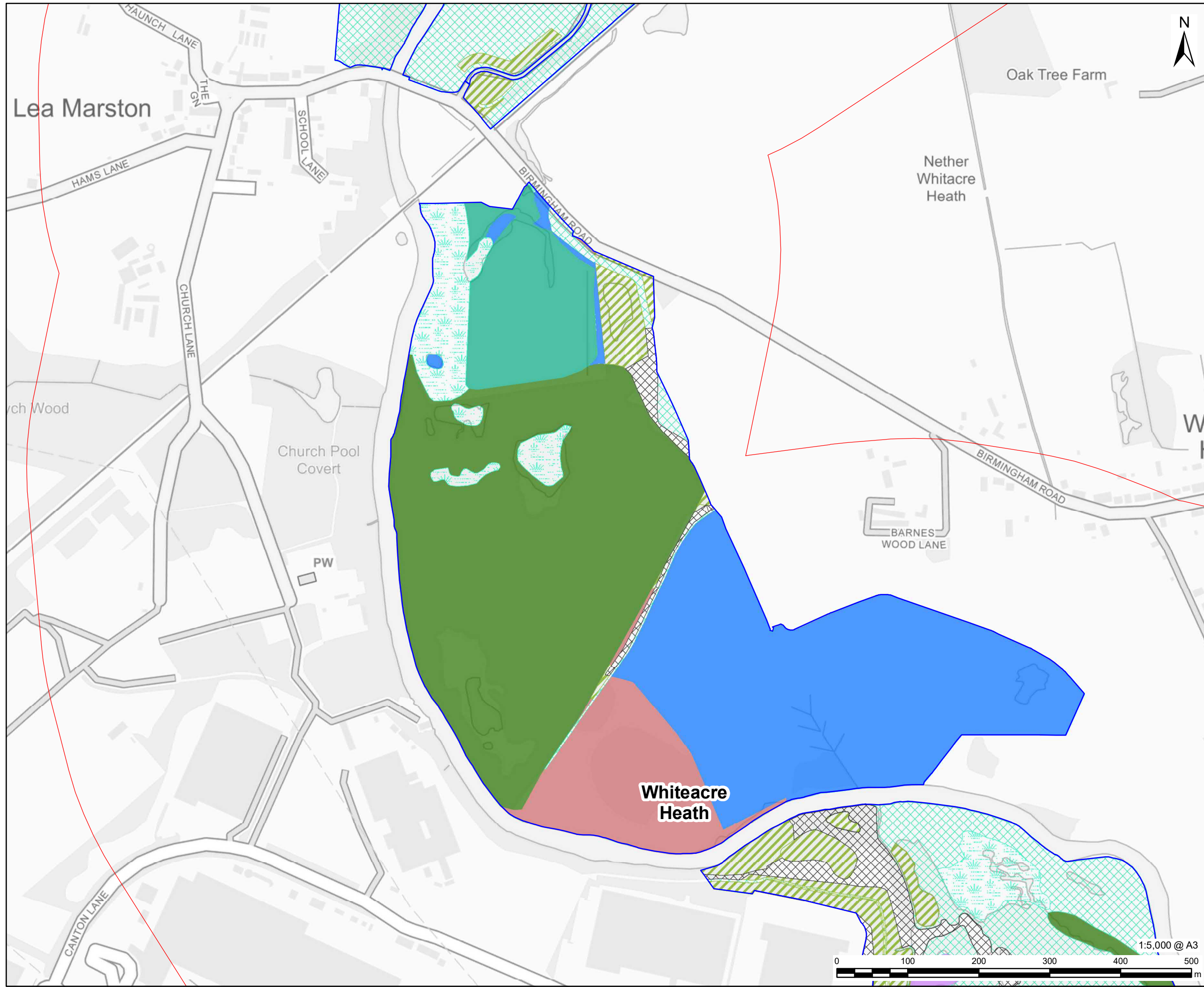
**FIGURE NUMBER**

Figure 1 - Sheet 2 of 27



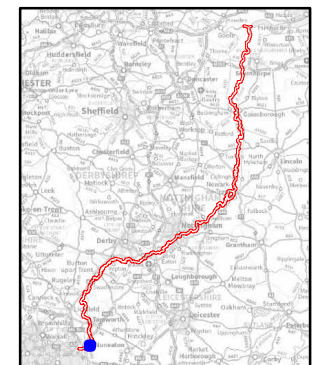
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**LEGEND**

	Wetland Habitat Study Area
	500m Study Area
	Coastal and Floodplain Grazing Marsh
	Deciduous Woodland
	Lowland Fens
	Reedbed
	Swamp
	Wet Grassland
	Wet Woodland
	Wetland Mosaic
	No Main Habitat But Additional Habitats Present



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**ISSUE PURPOSE**

FINAL

**PROJECT NUMBER**

60641557

**FIGURE TITLE**

Biodiversity Net Gain Baseline:  
Whitacre Heath (SSSI)

**FIGURE NUMBER**

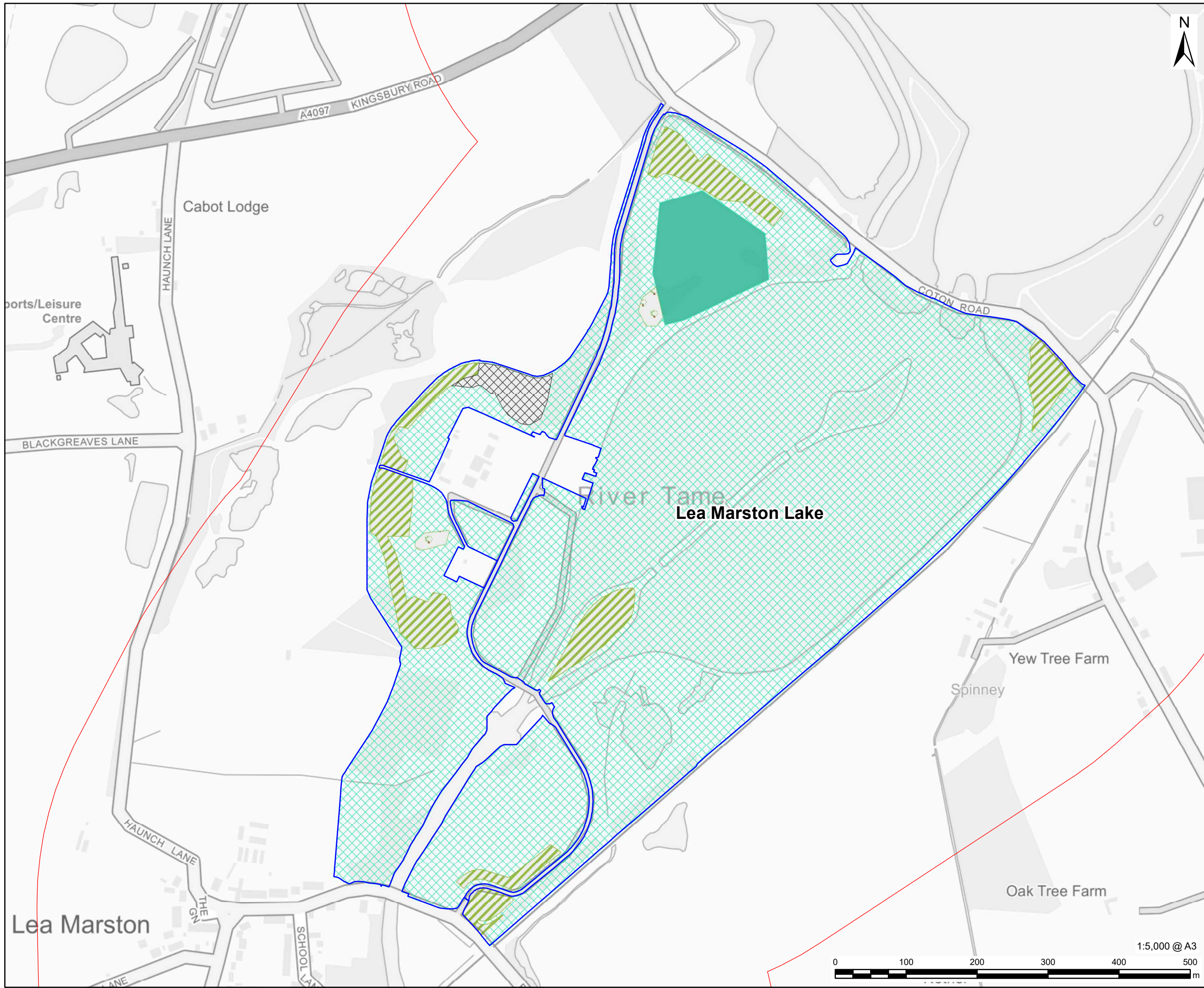
Figure 1 - Sheet 3 of 27

1:5,000 @ A3



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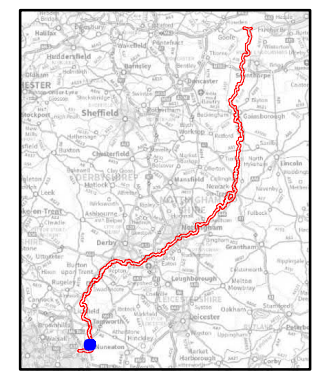


**PROJECT**  
Tame Trent and Humber  
Hydrology, Ecology and  
Environment C-03640

**CLIENT**  
Affinity Water

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Alencon Link  
Basingstoke, RG21 7PP  
www.aecom.com

- LEGEND**
- Wetland Habitat Study
  - 500m Study Area
  - Deciduous Woodland
  - Traditional Orchard
  - Wet Grassland
  - Wetland Mosaic
  - No Main Habitat But Additional Habitats Present



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**ISSUE PURPOSE**  
FINAL

**PROJECT NUMBER**  
60641557

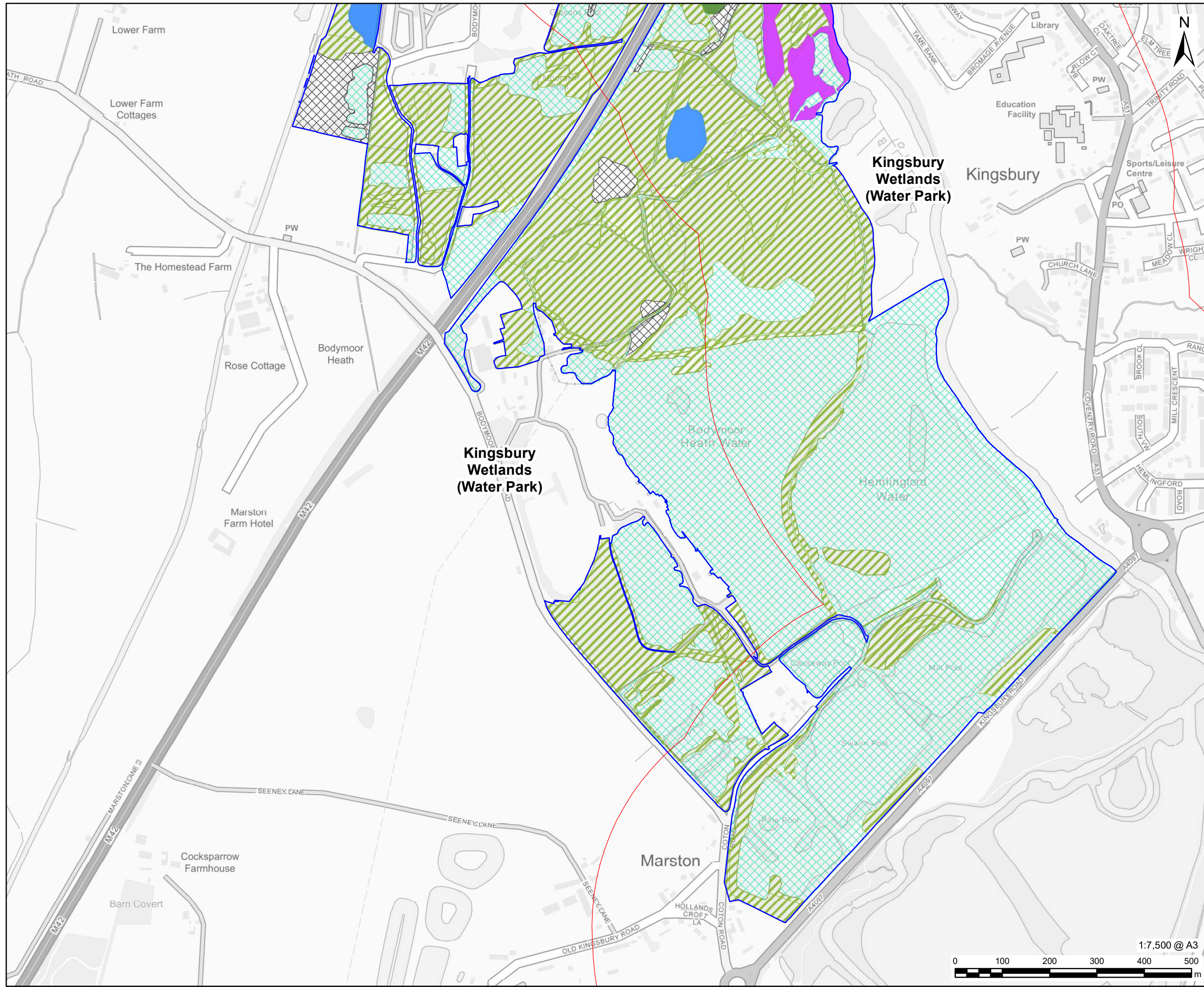
**FIGURE TITLE**  
Biodiversity Net Gain Baseline:  
Lea Marston Lake (LWS)

**FIGURE NUMBER**  
Figure 1 - Sheet 4 of 27



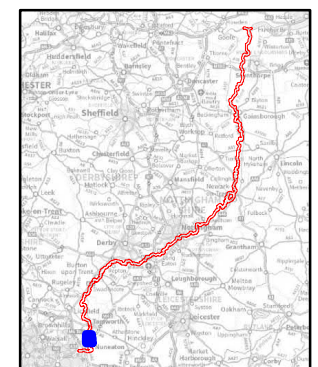
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**LEGEND**

	Wetland Habitat Study
	500m Study Area
	Coastal and Floodplain Grazing Marsh
	Good Quality Semi-improved Grassland
	Deciduous Woodland
	Swamp
	Wet Woodland
	Wetland Mosaic
	No Main Habitat But Additional Habitats Present



**NOTES**

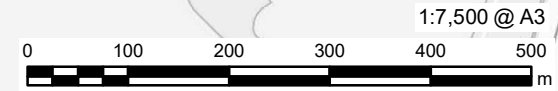
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**ISSUE PURPOSE**  
FINAL

**PROJECT NUMBER**  
60641557

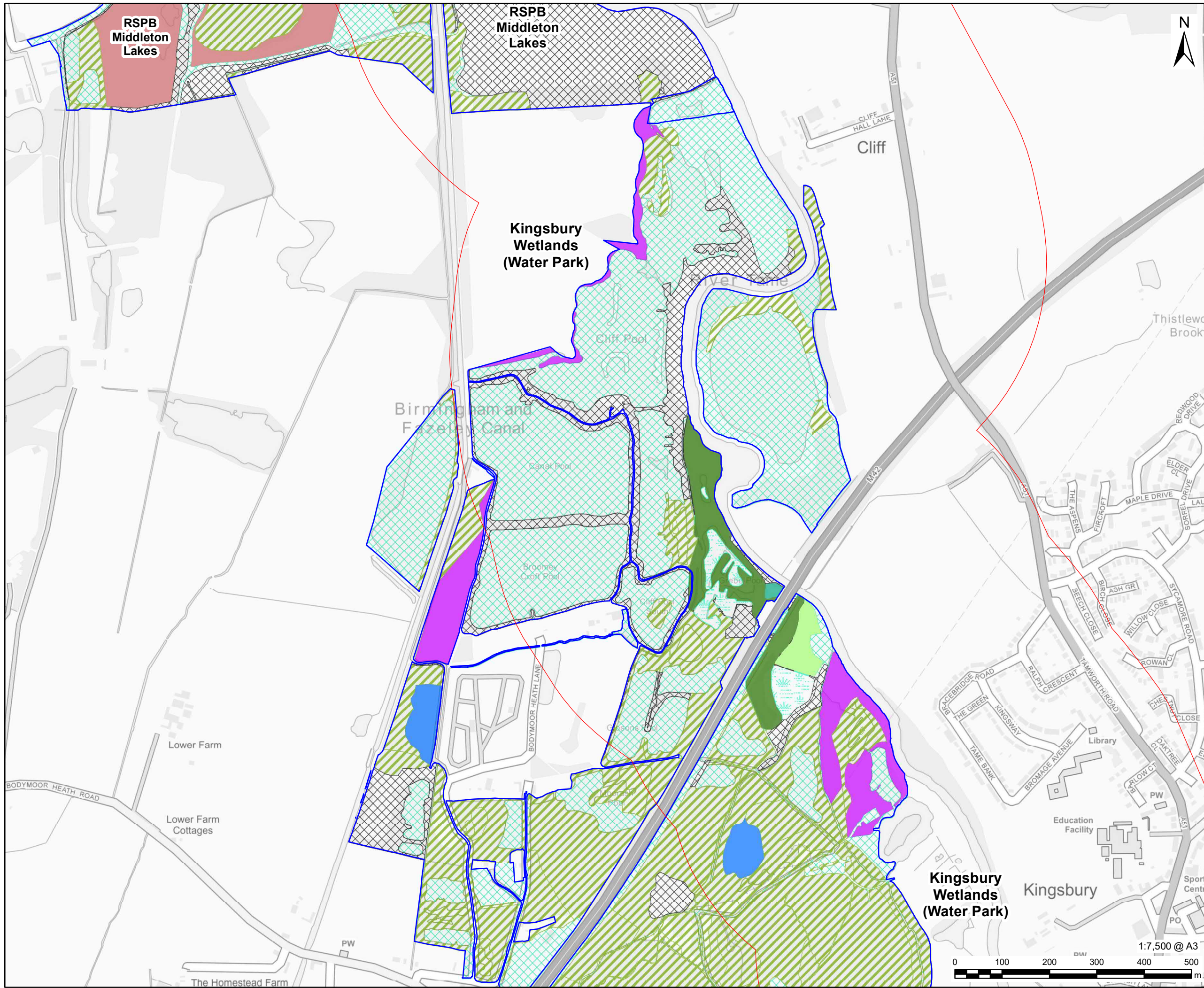
**FIGURE TITLE**  
Biodiversity Net Gain Baseline:  
Kingsbury Wetlands (Water Park)  
(LWS)

**FIGURE NUMBER**  
Figure 1 - Sheet 5 of 27



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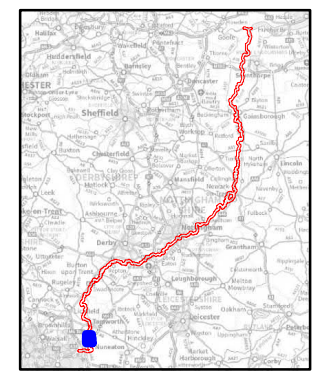
**AECOM**

**PROJECT**  
Tame Trent and Humber  
Hydrology, Ecology and  
Environment C-03640

**CLIENT**  
Affinity Water

**CONSULTANT**  
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Midpoint,  
Alencon Link  
Basingstoke, RG21 7PP  
www.aecom.com

- LEGEND**
- Wetland Habitat Study
  - 500m Study Area
  - Coastal and Floodplain Grazing Marsh
  - Good Quality Semi-improved Grassland
  - Deciduous Woodland
  - Lowland Fens
  - Lowland Meadow
  - Swamp
  - Wet Grassland
  - Wet Woodland
  - Wetland Mosaic
  - No Main Habitat But Additional Habitats Present



**NOTES**

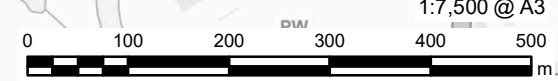
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**ISSUE PURPOSE**  
FINAL

**PROJECT NUMBER**  
60641557

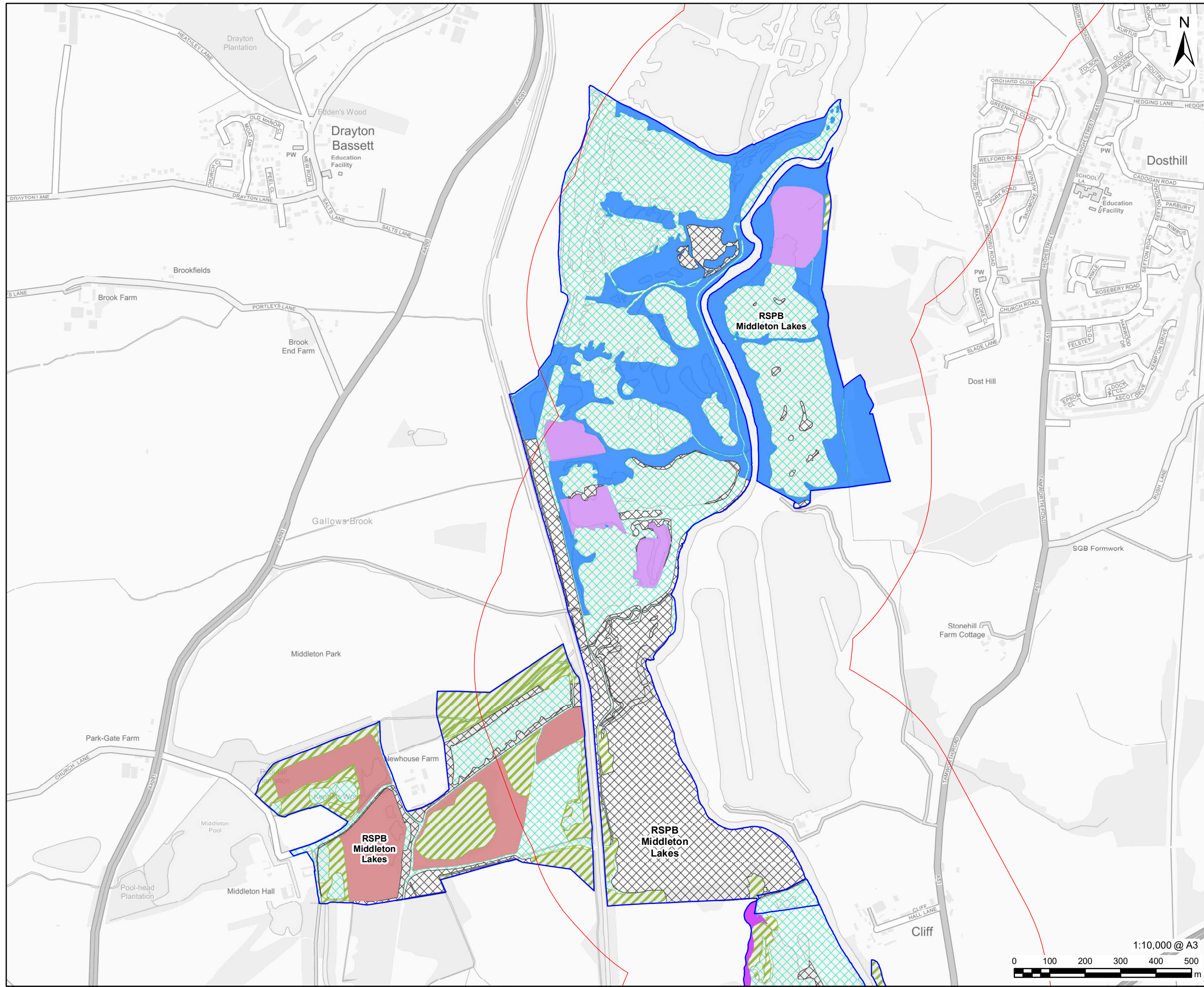
**FIGURE TITLE**  
Biodiversity Net Gain Baseline:  
Kingsbury Wetlands (Water Park)  
(LWS)

**FIGURE NUMBER**  
Figure 1 - Sheet 6 of 27



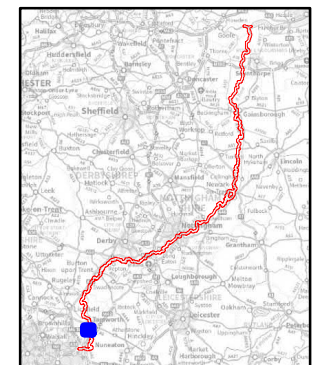
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**LEGEND**

	Wetland Habitat Study
	500m Study Area
	Coastal and Floodplain Grazing Marsh
	Good Quality Semi-improved Grassland
	Deciduous Woodland
	Lowland Fens
	Reedbed
	Wetland Mosaic
	No Main Habitat But Additional Habitats Present



**NOTES**

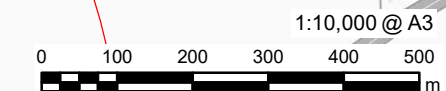
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**ISSUE PURPOSE**  
 FINAL

**PROJECT NUMBER**  
 60641557

**FIGURE TITLE**  
 Biodiversity Net Gain Baseline:  
 Middleton Lakes (RSPB Reserve),  
 Birmingham & Fazeley Canal, Dosthill

**FIGURE NUMBER**  
 Figure 1 - Sheet 7 of 27



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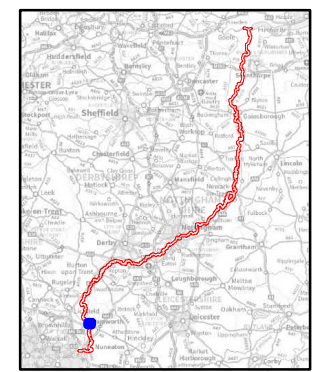


**PROJECT**  
Tame Trent and Humber  
Hydrology, Ecology and  
Environment C-03640

**CLIENT**  
Affinity Water

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www.aecom.com

- LEGEND**
- Wetland Habitat Study
  - 500m Study Area
  - Coastal and Floodplain Grazing Marsh
  - Good Quality Semi-improved Grassland
  - Deciduous Woodland
  - Swamp
  - Wet Grassland
  - Wetland Mosaic
  - No Main Habitat But Additional Habitats Present



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**ISSUE PURPOSE**  
FINAL

**PROJECT NUMBER**  
60641557

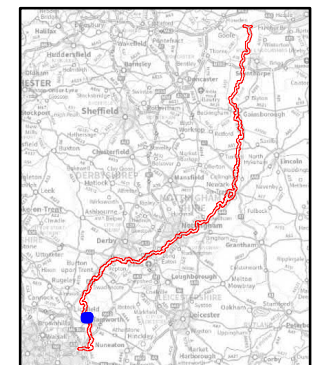
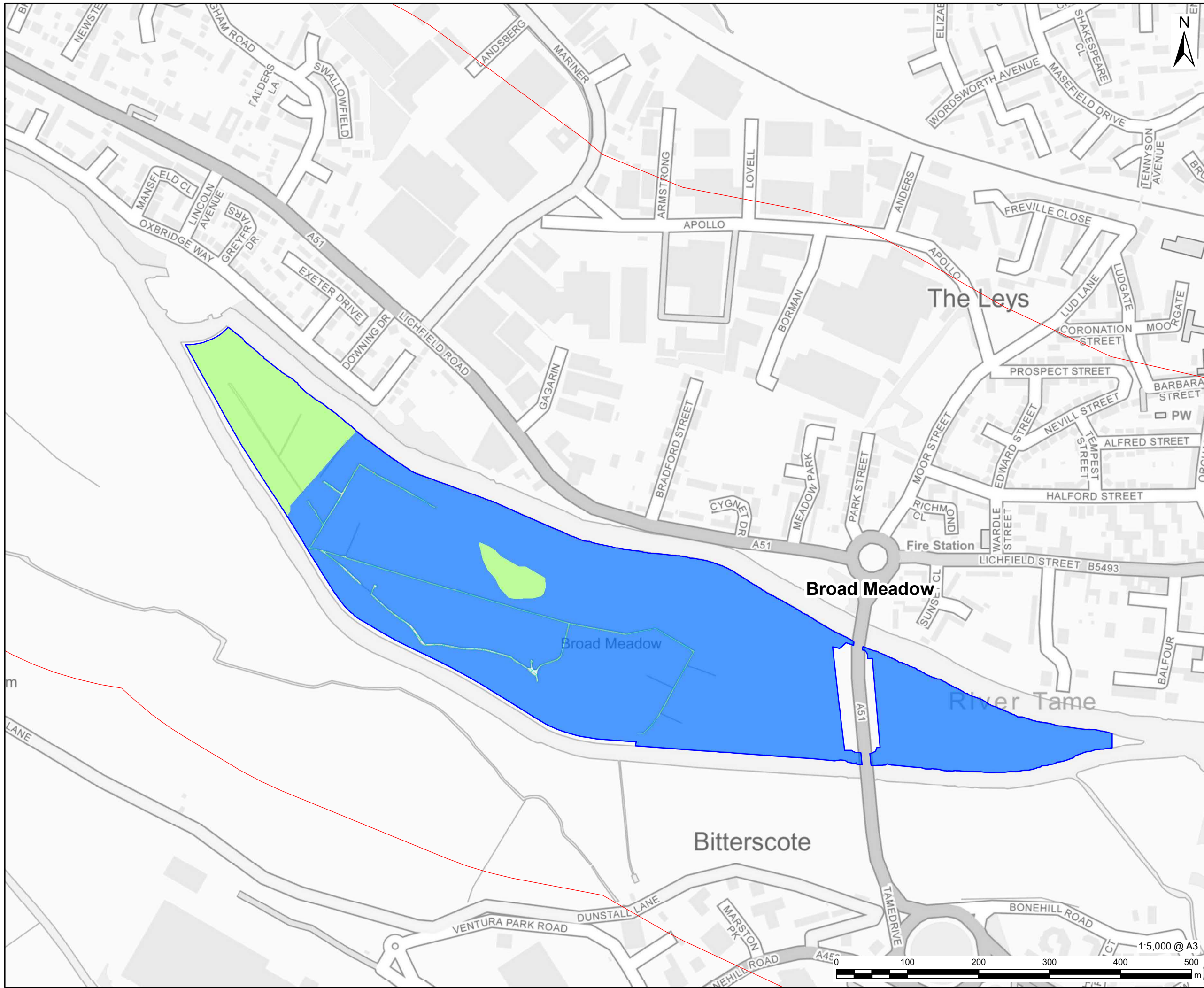
**FIGURE TITLE**  
Biodiversity Net Gain Baseline:  
Tameside (LNR)

**FIGURE NUMBER**  
Figure 1 - Sheet 8 of 27



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**ISSUE PURPOSE**  
FINAL

**PROJECT NUMBER**  
60641557

**FIGURE TITLE**  
Biodiversity Net Gain Baseline:  
Broad Meadow (LNR)

**FIGURE NUMBER**  
Figure 1 - Sheet 9 of 27

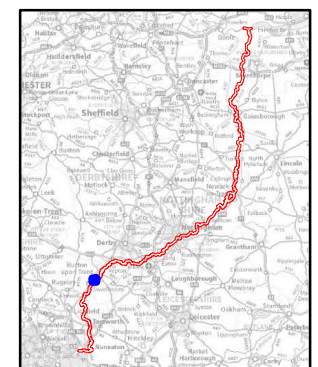
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**LEGEND**

	Wetland Habitat Study Area
	500m Study Area
	Deciduous Woodland
	Lowland Fens
	Reedbed
	Wetland Mosaic
	No Main Habitat But Additional Habitats Present



**NOTES**

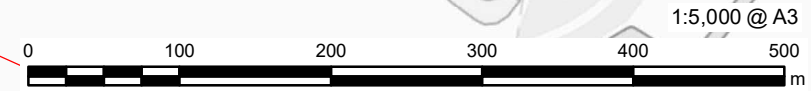
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**ISSUE PURPOSE**  
FINAL

**PROJECT NUMBER**  
60641557

**FIGURE TITLE**  
Biodiversity Net Gain Baseline:  
Drakelow Wildfowl Reserve (LWS)

**FIGURE NUMBER**  
Figure 1 - Sheet 10 of 27



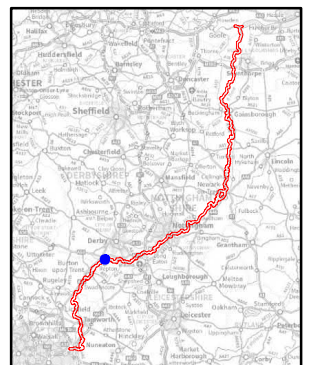
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**LEGEND**

	Wetland Habitat Study
	500m Study Area
	Deciduous Woodland
	Lowland Fens
	Swamp
	Wetland Mosaic

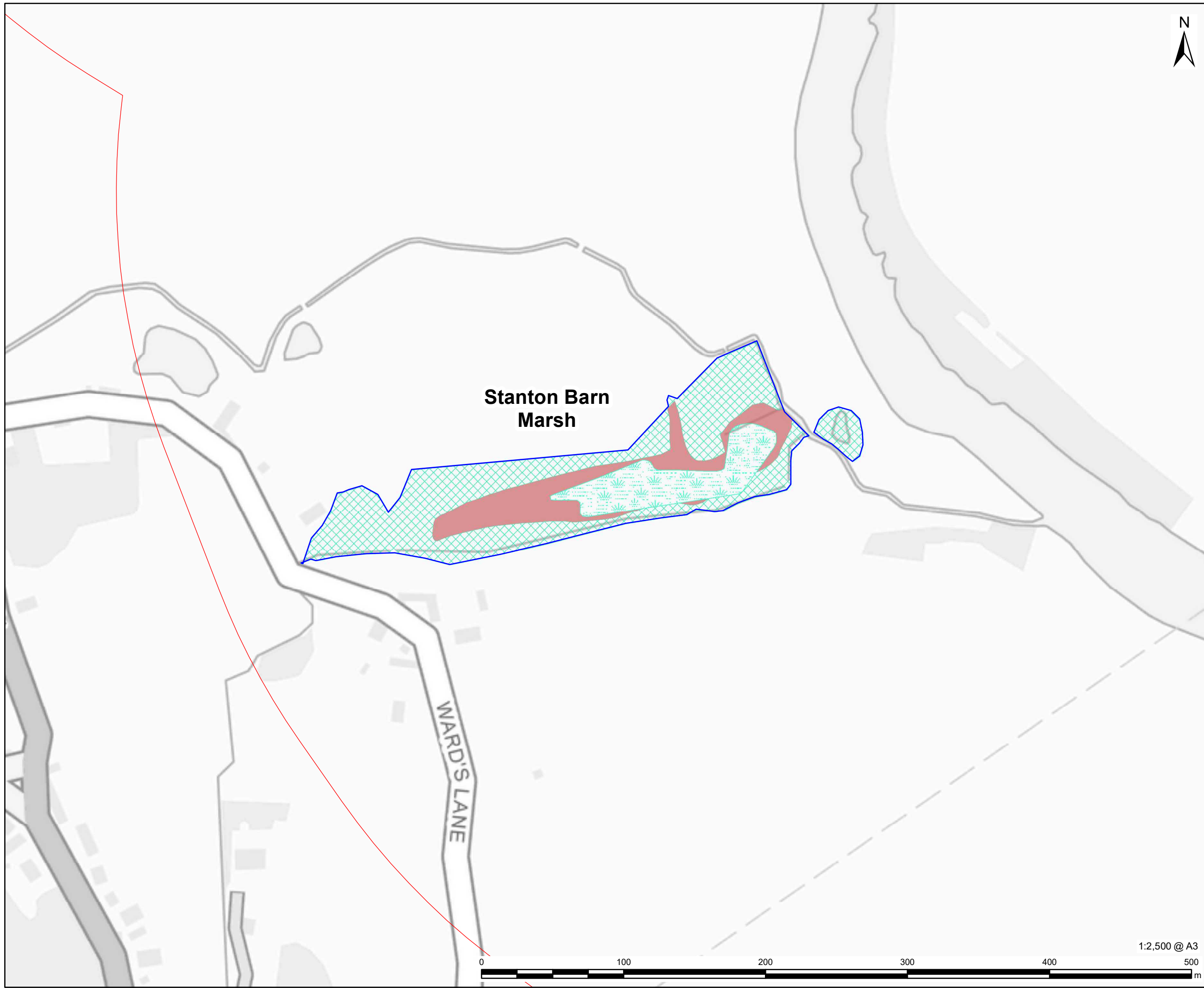


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**ISSUE PURPOSE**  
FINAL  
**PROJECT NUMBER**  
60641557  
**FIGURE TITLE**  
Biodiversity Net Gain Baseline:  
Sports Ground Marsh (LWS)

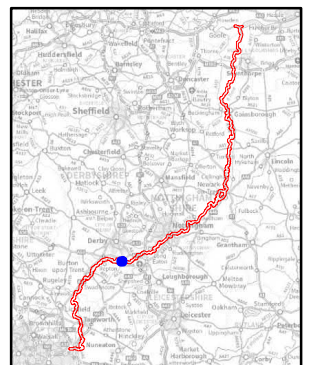
**FIGURE NUMBER**  
Figure 1 - Sheet 11 of 27

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**LEGEND**

	Wetland Habitat Study Area
	500m Study Area
	Lowland Fens
	Swamp
	Wetland Mosaic



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**ISSUE PURPOSE**

FINAL

**PROJECT NUMBER**

60641557

**FIGURE TITLE**

Biodiversity Net Gain Baseline:  
Stanton Barn Marsh (LWS)

**FIGURE NUMBER**

Figure 1 - Sheet 12 of 27

1:2,500 @ A3

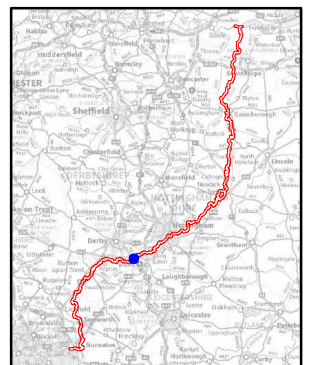


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**LEGEND**

	Wetland Habitat Study Area
	500m Study Area
	Coastal and Floodplain Grazing Marsh
	Lowland Fens
	Reedbed
	Wetland Mosaic



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**ISSUE PURPOSE**

FINAL

**PROJECT NUMBER**

60641557

**FIGURE TITLE**

Biodiversity Net Gain Baseline:  
Trentside Ponds (LWS)

**FIGURE NUMBER**

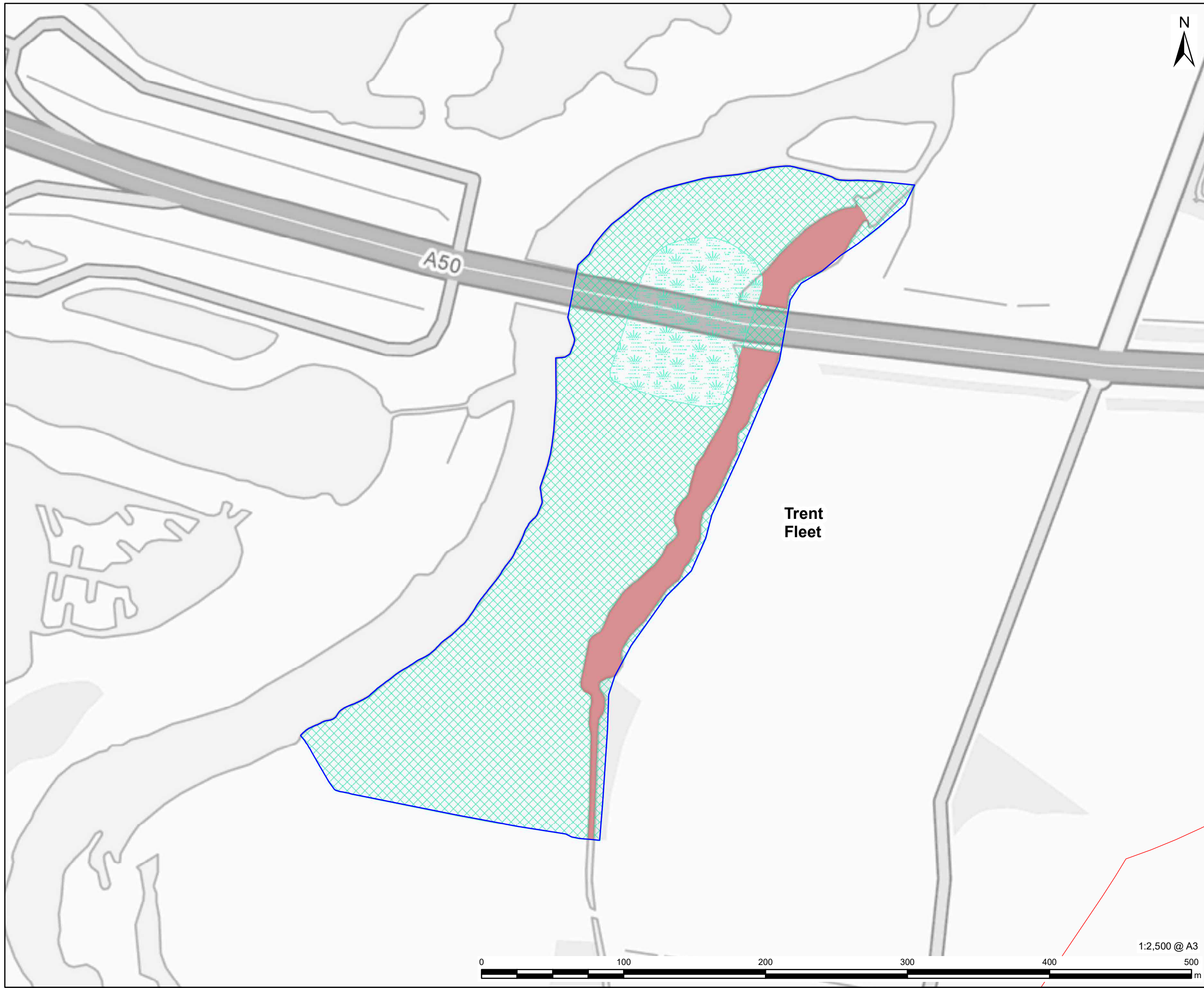
Figure 1 - Sheet 13 of 27

1:2,500 @ A3



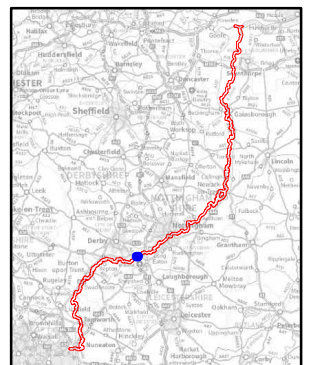
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**LEGEND**

	Wetland Habitat Study Area
	500m Study Area
	Lowland Fens
	Swamp
	Wetland Mosaic



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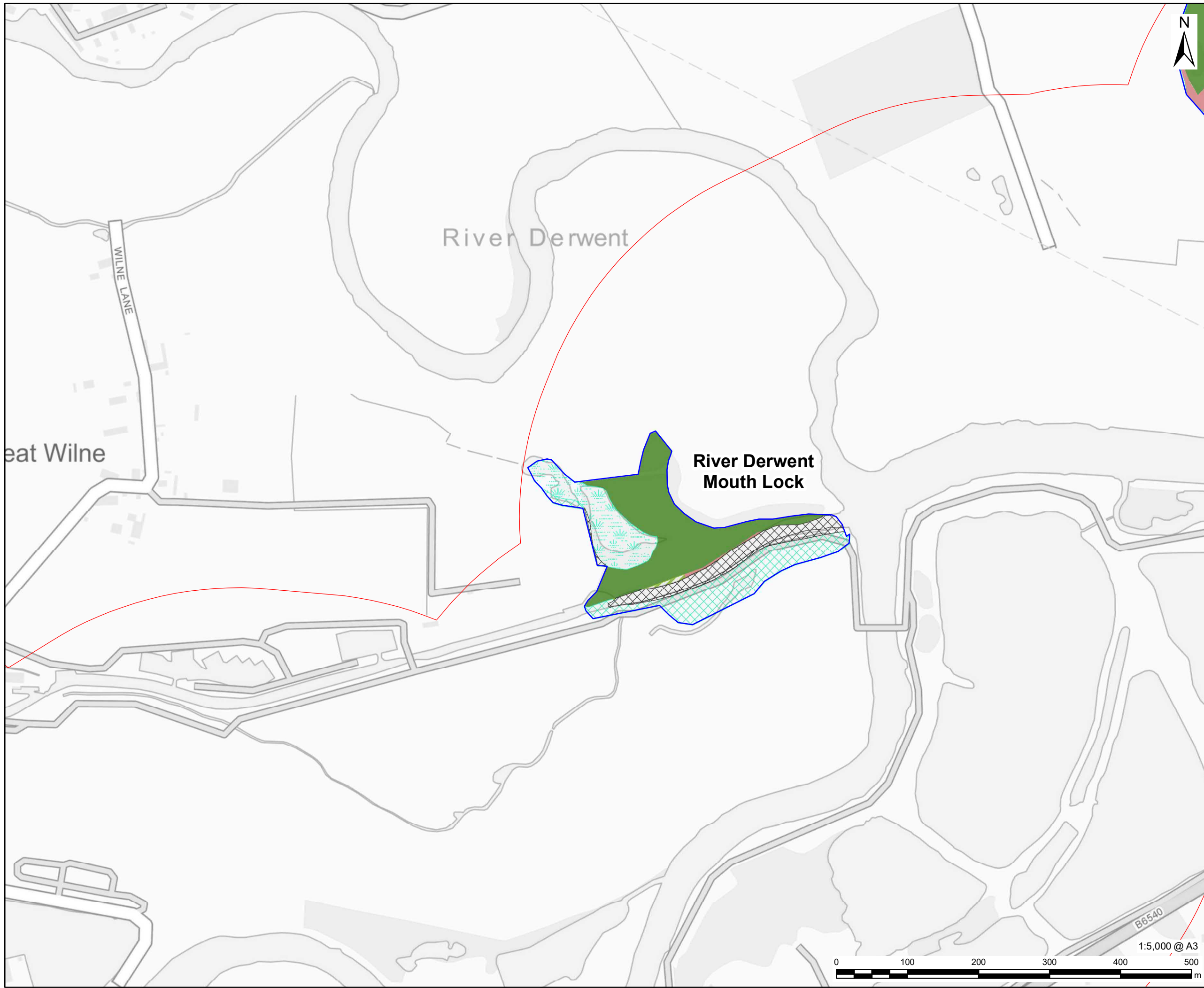
**ISSUE PURPOSE**  
FINAL  
**PROJECT NUMBER**  
60641557  
**FIGURE TITLE**  
Biodiversity Net Gain Baseline:  
Trent Fleet (LWS)

**FIGURE NUMBER**  
Figure 1 - Sheet 14 of 27



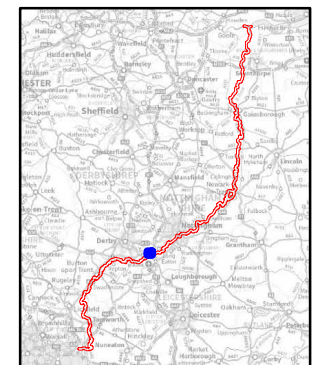
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**LEGEND**

	Wetland Habitat Study Area
	500m Study Area
	Deciduous Woodland
	Lowland Fens
	Swamp
	Wet Woodland
	Wetland Mosaic
	No Main Habitat But Additional Habitats Present



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**ISSUE PURPOSE**  
FINAL

**PROJECT NUMBER**  
60641557

**FIGURE TITLE**  
Biodiversity Net Gain Baseline:  
River Derwent Mouth Lock (LWS)

**FIGURE NUMBER**  
Figure 1 - Sheet 15 of 27

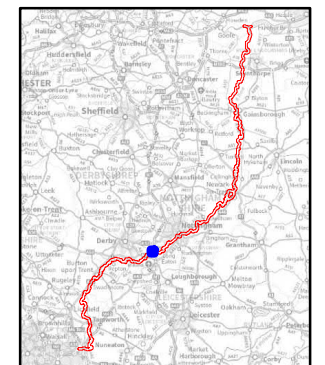


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**LEGEND**

	Wetland Habitat Study Area
	500m Study Area
	Deciduous Woodland
	Lowland Fens
	Swamp
	Wet Woodland
	Wetland Mosaic
	No Main Habitat But Additional Habitats Present



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**ISSUE PURPOSE**

FINAL

**PROJECT NUMBER**

60641557

**FIGURE TITLE**

Biodiversity Net Gain Baseline:  
Sawley Carr (LWS)

**FIGURE NUMBER**

Figure 1 - Sheet 16 of 27

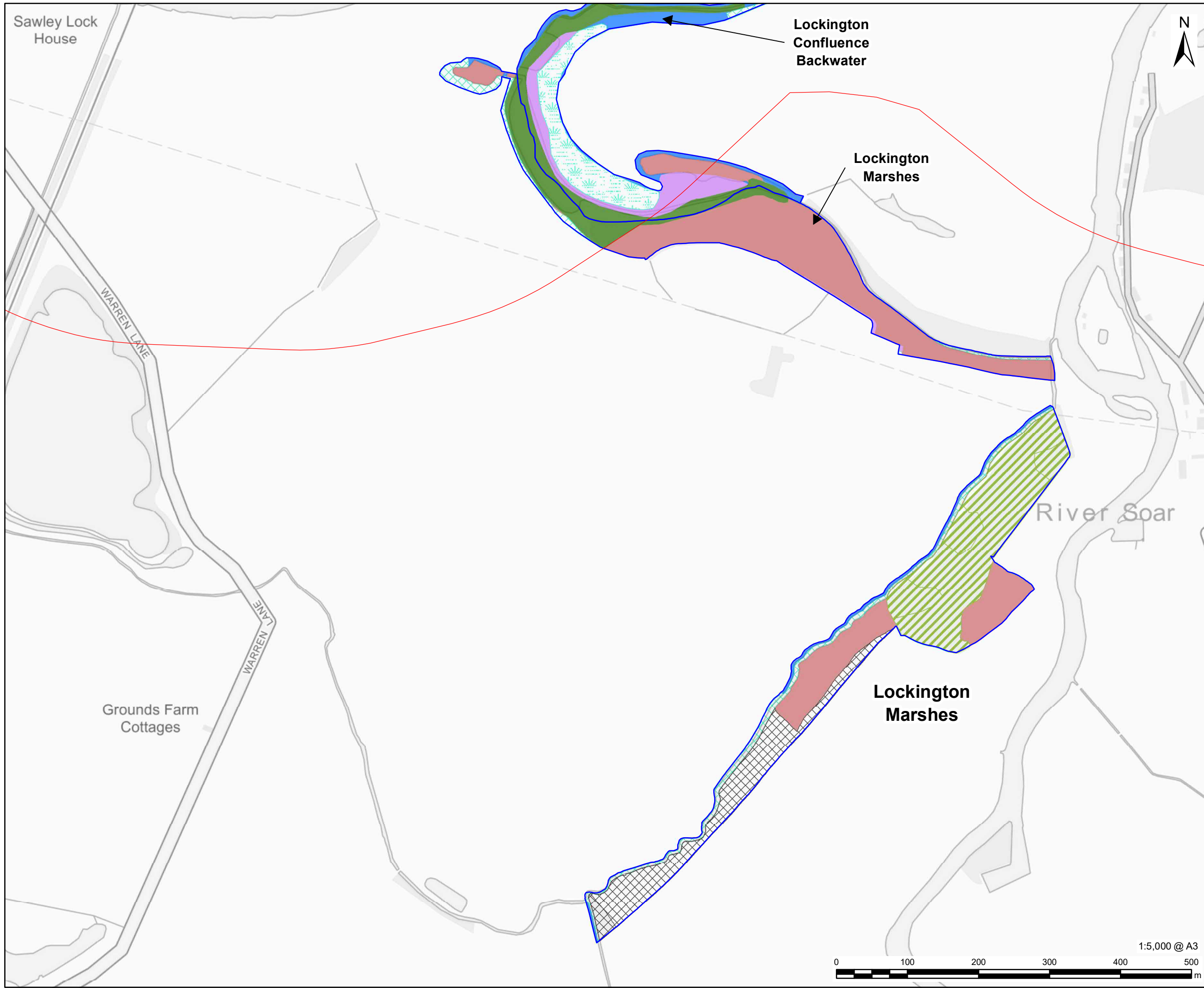
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1:5,000 @ A3



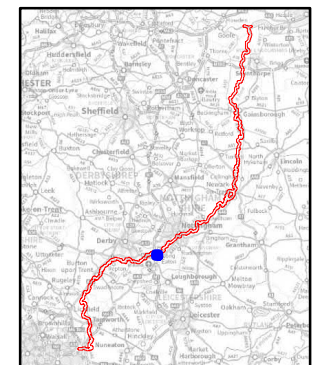
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**LEGEND**

- Wetland Habitat Study Area
- 500m Study Area
- Coastal and Floodplain Grazing Marsh
- Deciduous Woodland
- Lowland Fens
- Reedbed
- Swamp
- Wet Woodland
- Wetland Mosaic
- No Main Habitat But Additional Habitats Present



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**ISSUE PURPOSE**

FINAL

**PROJECT NUMBER**

60641557

**FIGURE TITLE**

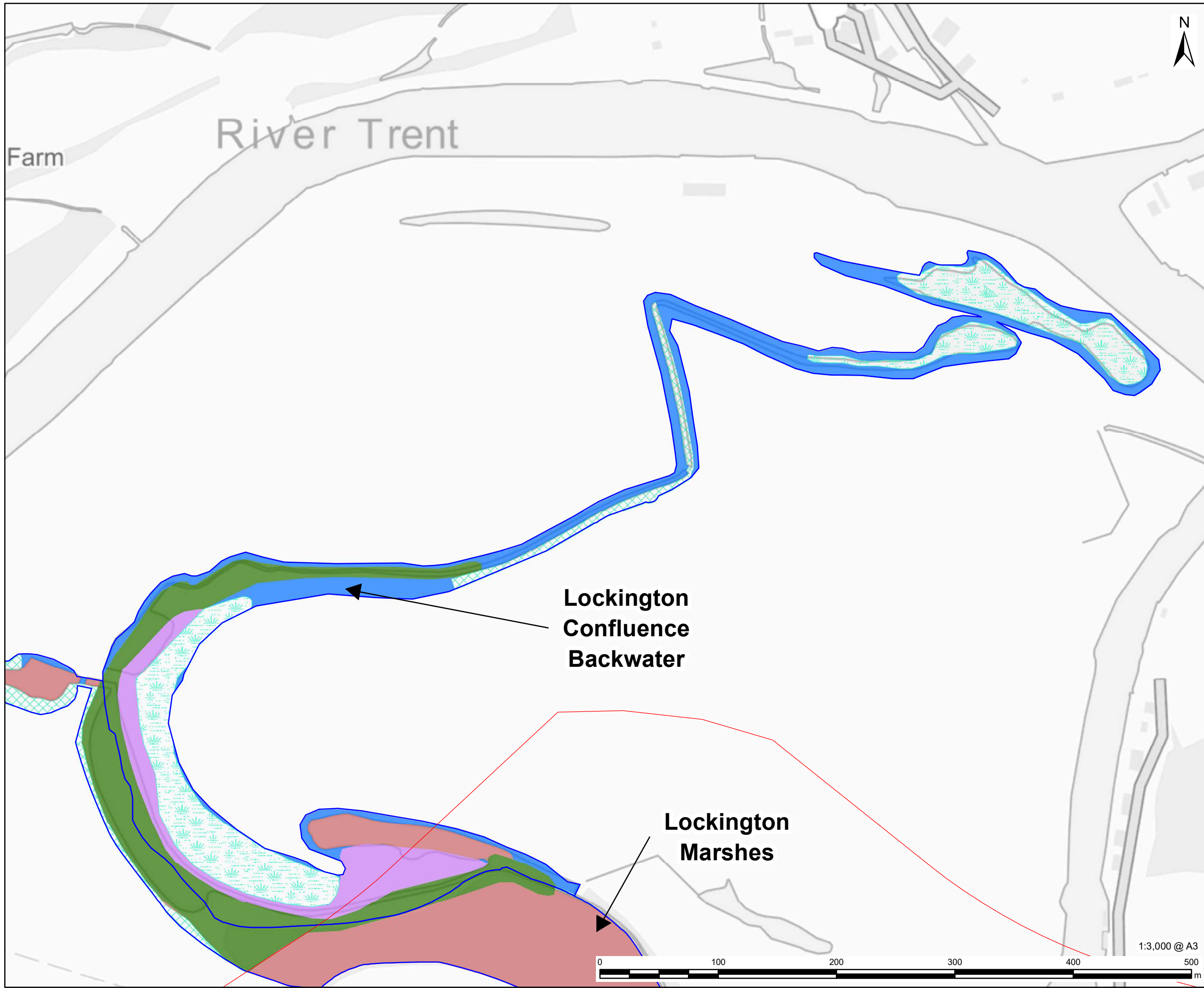
Biodiversity Net Gain Baseline:  
Lockington Marshes (SSSI)

**FIGURE NUMBER**

Figure 1 - Sheet 17 of 27

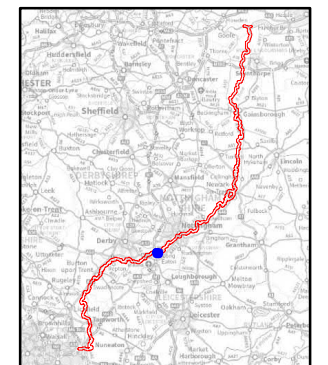






**LEGEND**

	Wetland Habitat Study Area
	500m Study Area
	Coastal and Floodplain Grazing Marsh
	Lowland Fens
	Reedbed
	Wet Woodland
	Wetland Mosaic



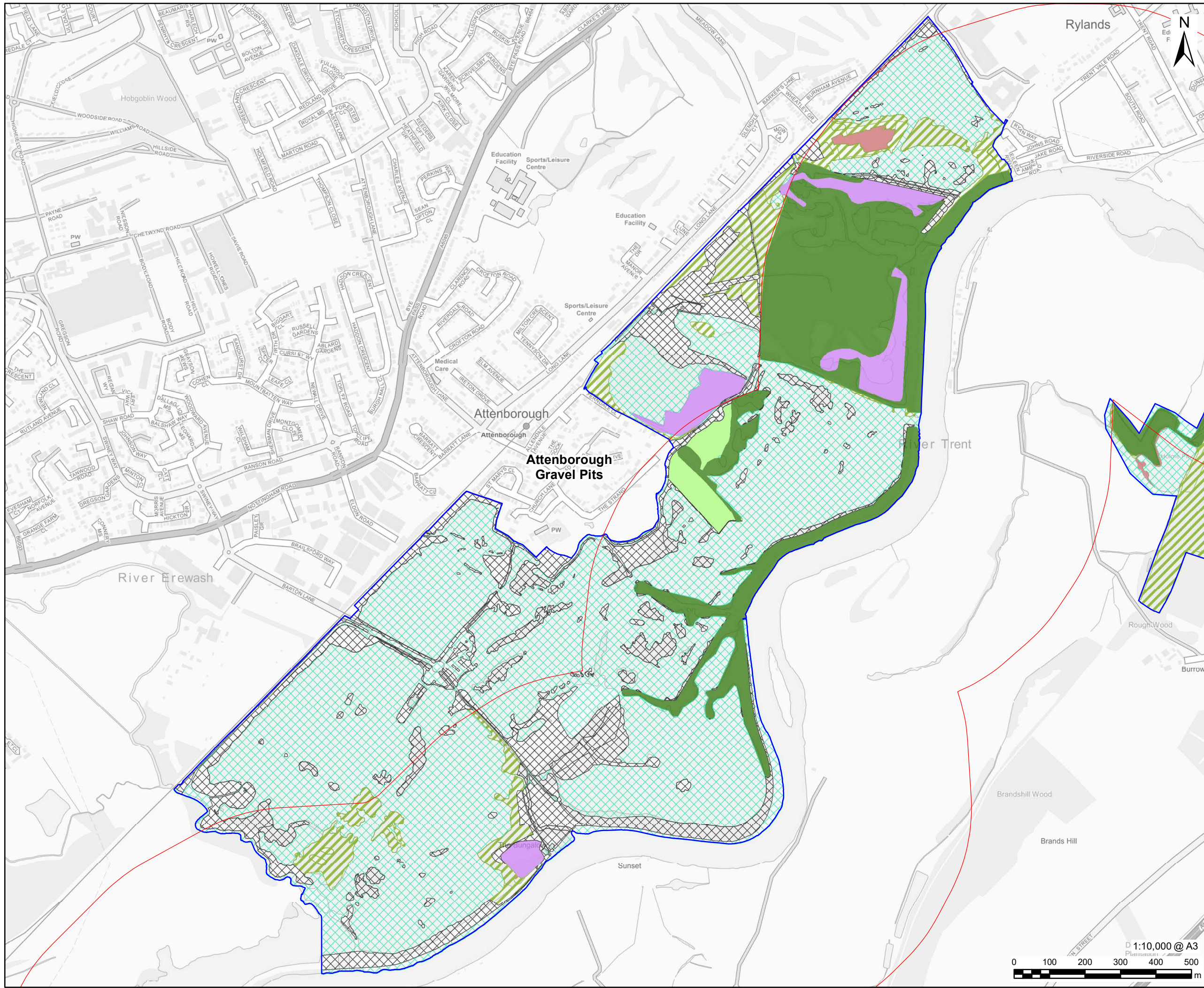
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**ISSUE PURPOSE**  
FINAL  
**PROJECT NUMBER**  
60641557  
**FIGURE TITLE**  
Biodiversity Net Gain Baseline:  
Lockington Confluence Backwater  
(LWS)

**FIGURE NUMBER**  
Figure 1 - Sheet 18 of 27

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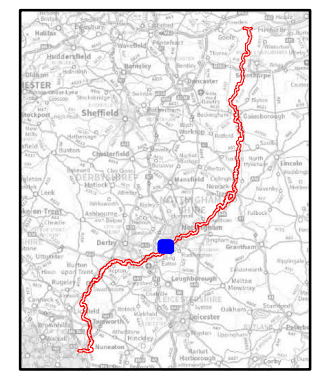


**PROJECT**  
Tame Trent and Humber  
Hydrology, Ecology and  
Environment C-03640

**CLIENT**  
Affinity Water

**CONSULTANT**  
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Midpoint,  
Alencon Link  
Basingstoke, RG21 7PP  
www.aecom.com

- LEGEND**
- Wetland Habitat Study
  - 500m Study Area
  - Deciduous Woodland
  - Lowland Meadow
  - Reedbed
  - Wet Woodland
  - Wetland Mosaic
  - No Main Habitat But Additional Habitats Present



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**ISSUE PURPOSE**  
FINAL

**PROJECT NUMBER**  
60641557

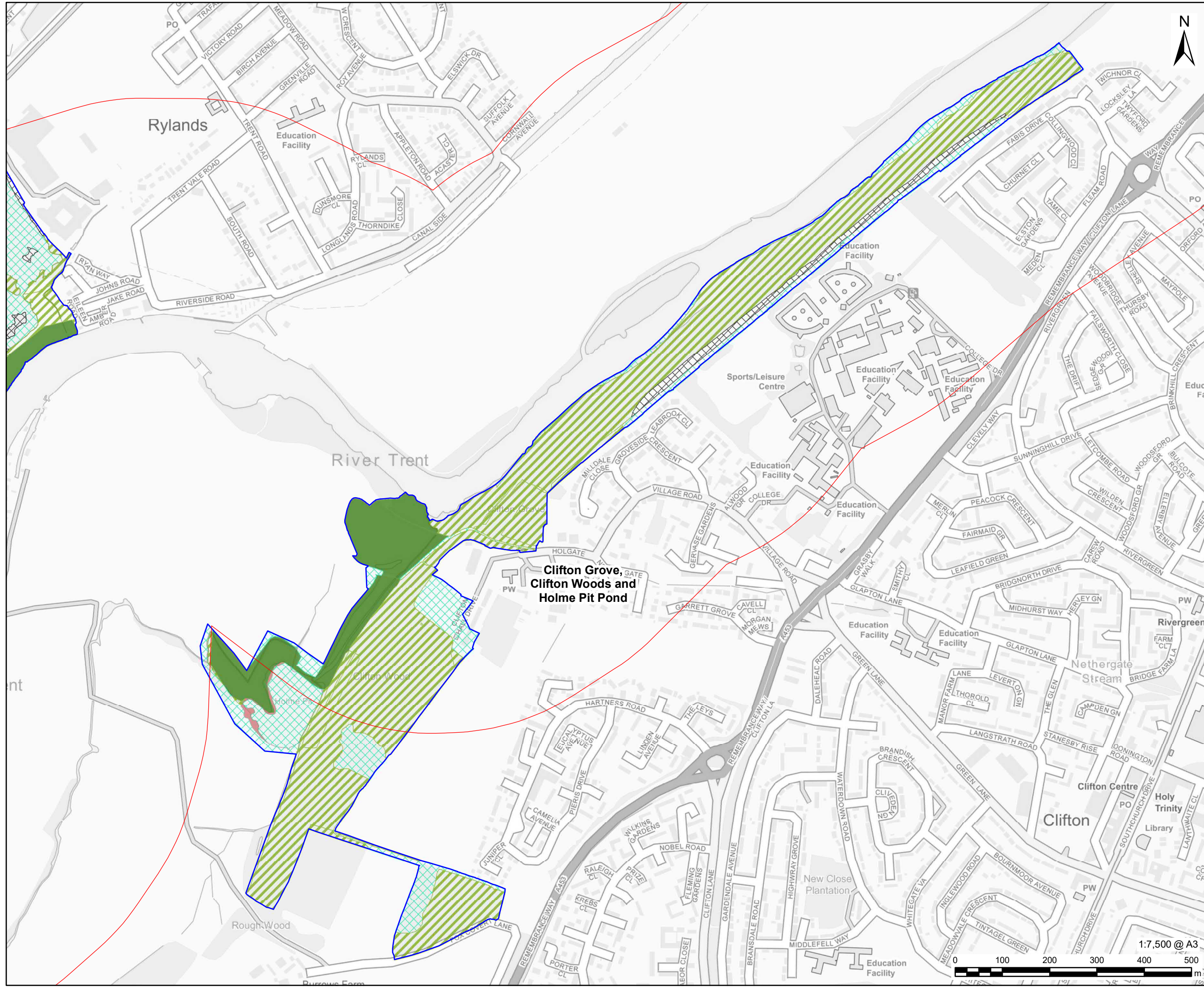
**FIGURE TITLE**  
Biodiversity Net Gain Baseline:  
Attenborough Gravel Pits (SSSI and  
LWS)

**FIGURE NUMBER**  
Figure 1 - Sheet 19 of 27



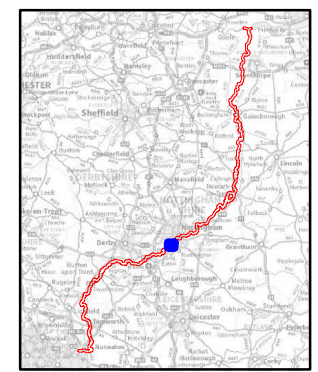
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**LEGEND**

	Wetland Habitat Study
	500m Study Area
	Deciduous Woodland
	Lowland Fens
	Wet Woodland
	Wetland Mosaic
	No Main Habitat But Additional Habitats Present



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**ISSUE PURPOSE**

FINAL

**PROJECT NUMBER**

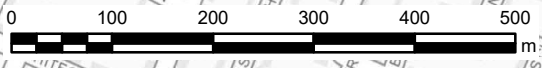
60641557

**FIGURE TITLE**

Biodiversity Net Gain Baseline:  
Clifton Grove, Clifton Woods and  
Holme Pit Pond (LNR), Holme Pit, Trent

**FIGURE NUMBER**

Figure 1 - Sheet 20 of 27

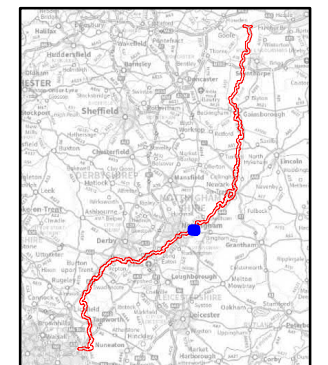






**LEGEND**

	Wetland Habitat Study
	500m Study Area
	Deciduous Woodland
	Lowland Fens
	Reedbed
	Wetland Mosaic
	No Main Habitat But Additional Habitats Present



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**ISSUE PURPOSE**

FINAL

**PROJECT NUMBER**

60641557

**FIGURE TITLE**

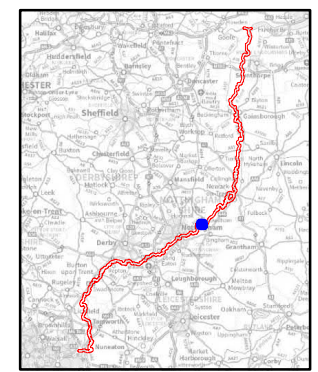
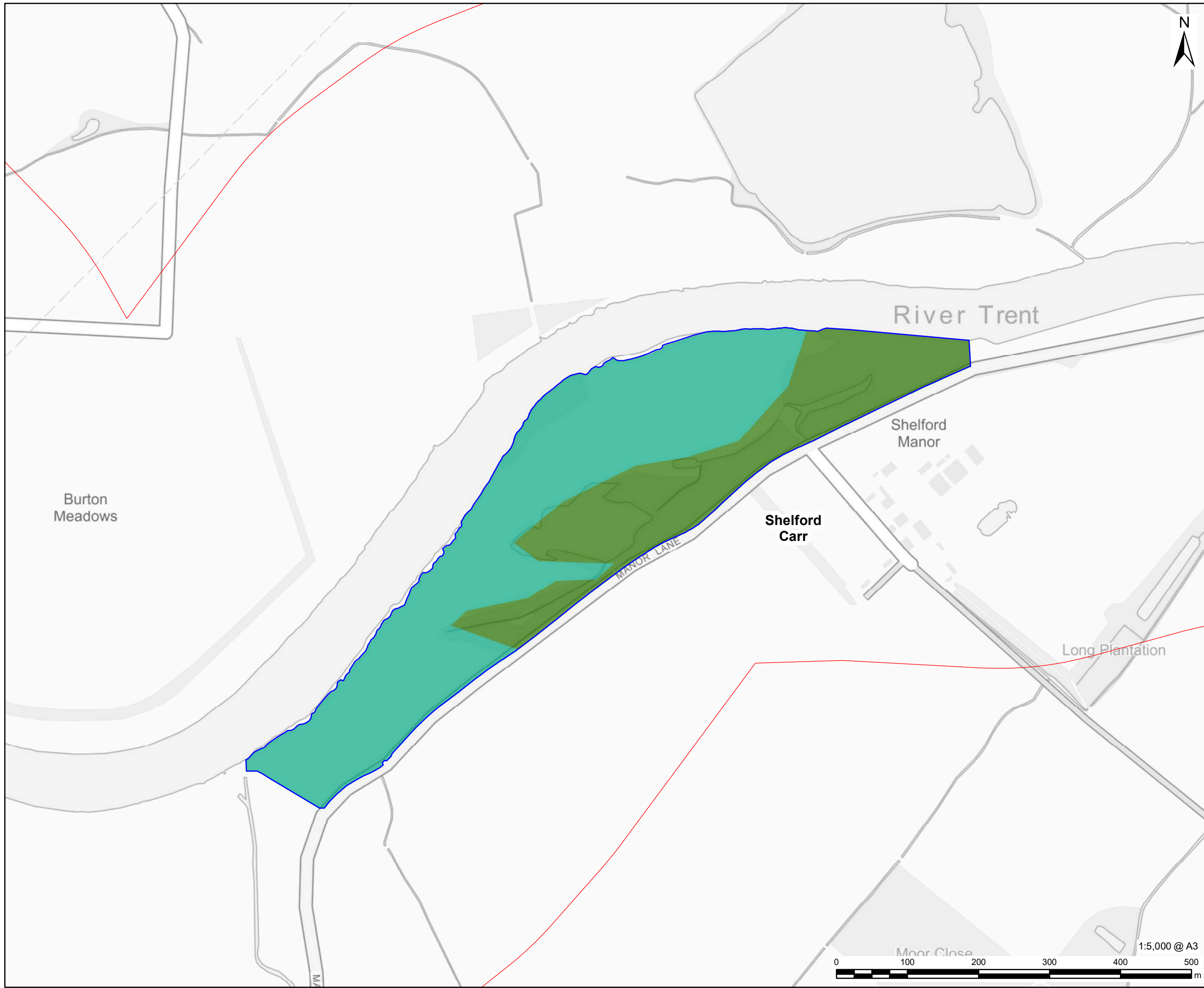
Biodiversity Net Gain Baseline:  
Netherfield Pits and Netherfield  
Dismantled Railway Sidings (LWS).

**FIGURE NUMBER**

Figure 1 - Sheet 21 of 27

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**ISSUE PURPOSE**  
FINAL

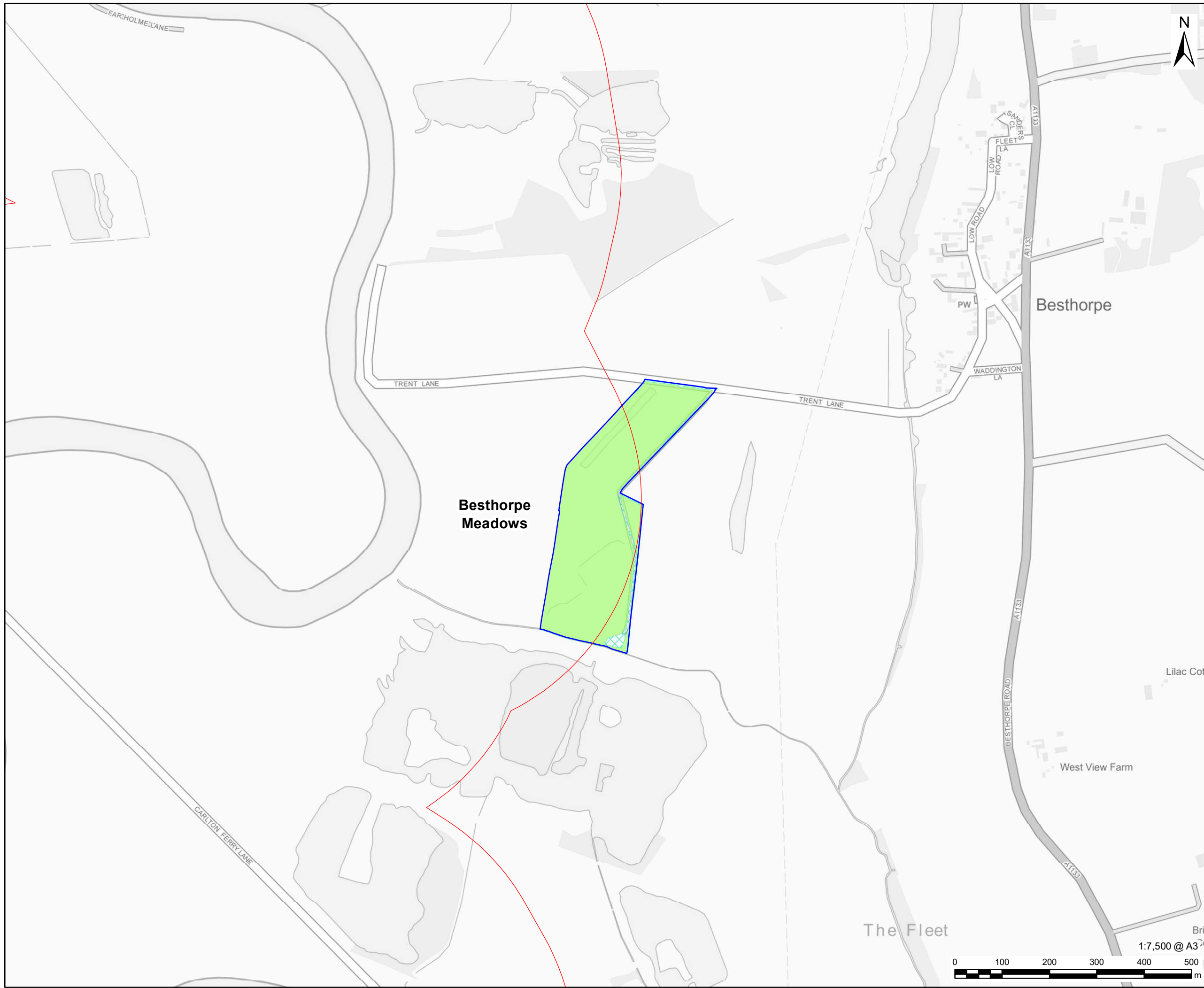
**PROJECT NUMBER**  
60641557

**FIGURE TITLE**  
Biodiversity Net Gain Baseline:  
Shelford Carr (LWS)

**FIGURE NUMBER**  
Figure 1 - Sheet 22 of 27

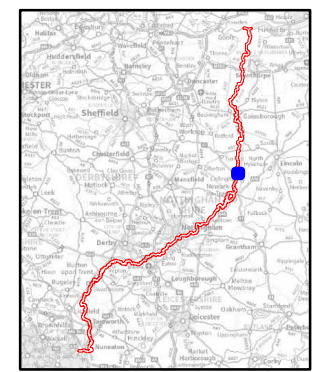


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**LEGEND**

	Wetland Habitat Study Area
	500m Study Area
	Good Quality Semi-improved Grassland
	Lowland Meadow
	Wetland Mosaic



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**ISSUE PURPOSE**  
FINAL

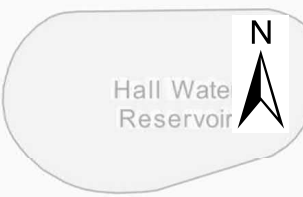
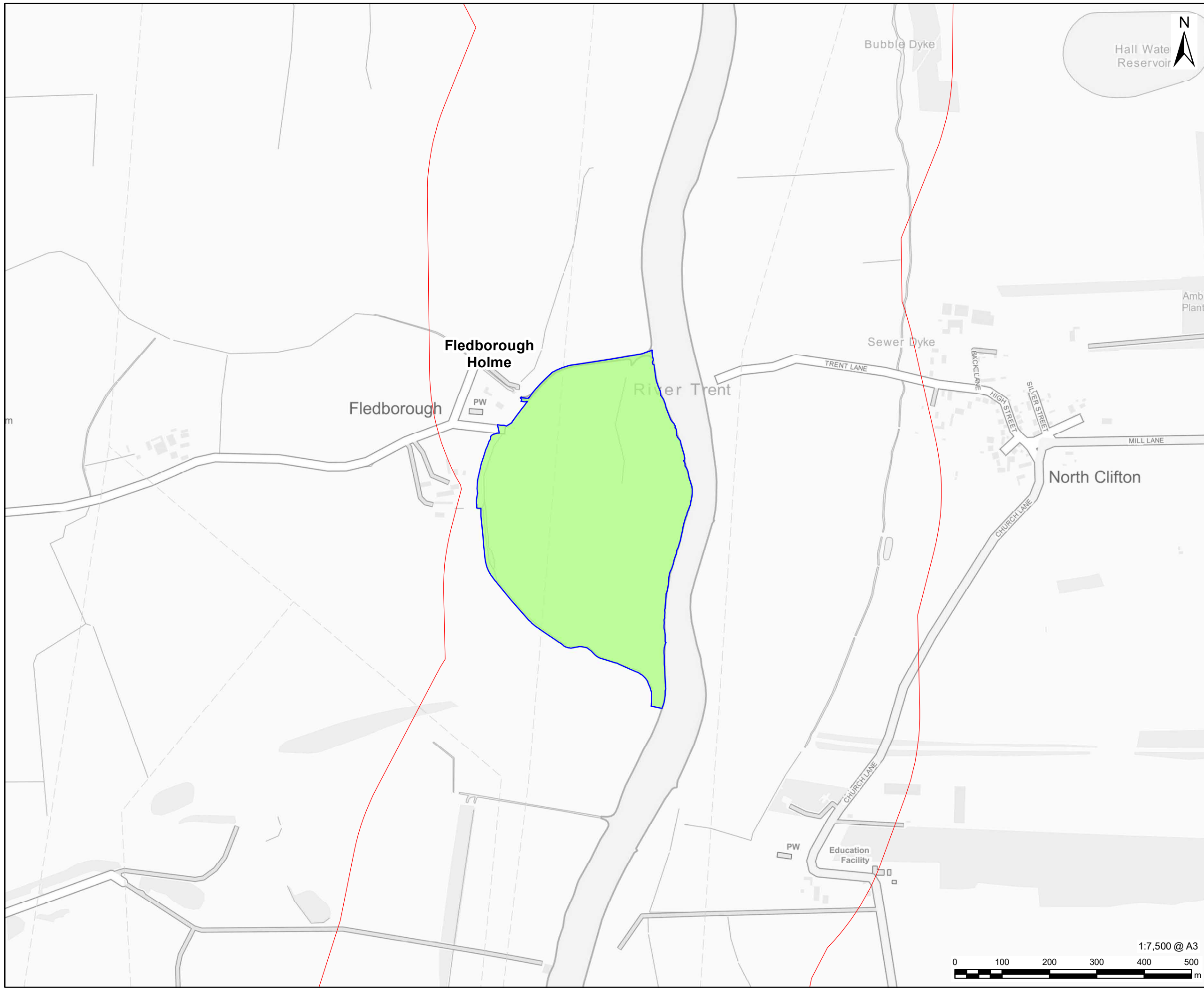
**PROJECT NUMBER**  
60641557

**FIGURE TITLE**  
Biodiversity Net Gain Baseline:  
Besthorpe Meadows (SSSI), Ballast Pit,  
Besthorpe (LWS)

**FIGURE NUMBER**  
Figure 1 - Sheet 23 of 27



1:7,500 @ A3

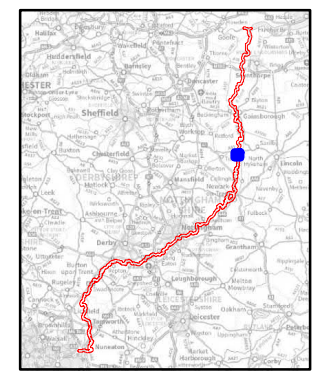


**PROJECT**  
Tame Trent and Humber  
Hydrology, Ecology and  
Environment C-03640

**CLIENT**  
Affinity Water

**CONSULTANT**  
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Alencon Link  
Basingstoke, RG21 7PP  
www.aecom.com

- LEGEND**
- Wetland Habitat Study Area
  - 500m Study Area
  - Lowland Meadow



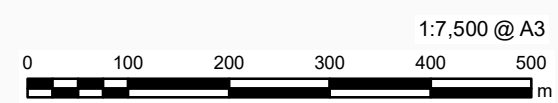
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**ISSUE PURPOSE**  
FINAL

**PROJECT NUMBER**  
60641557

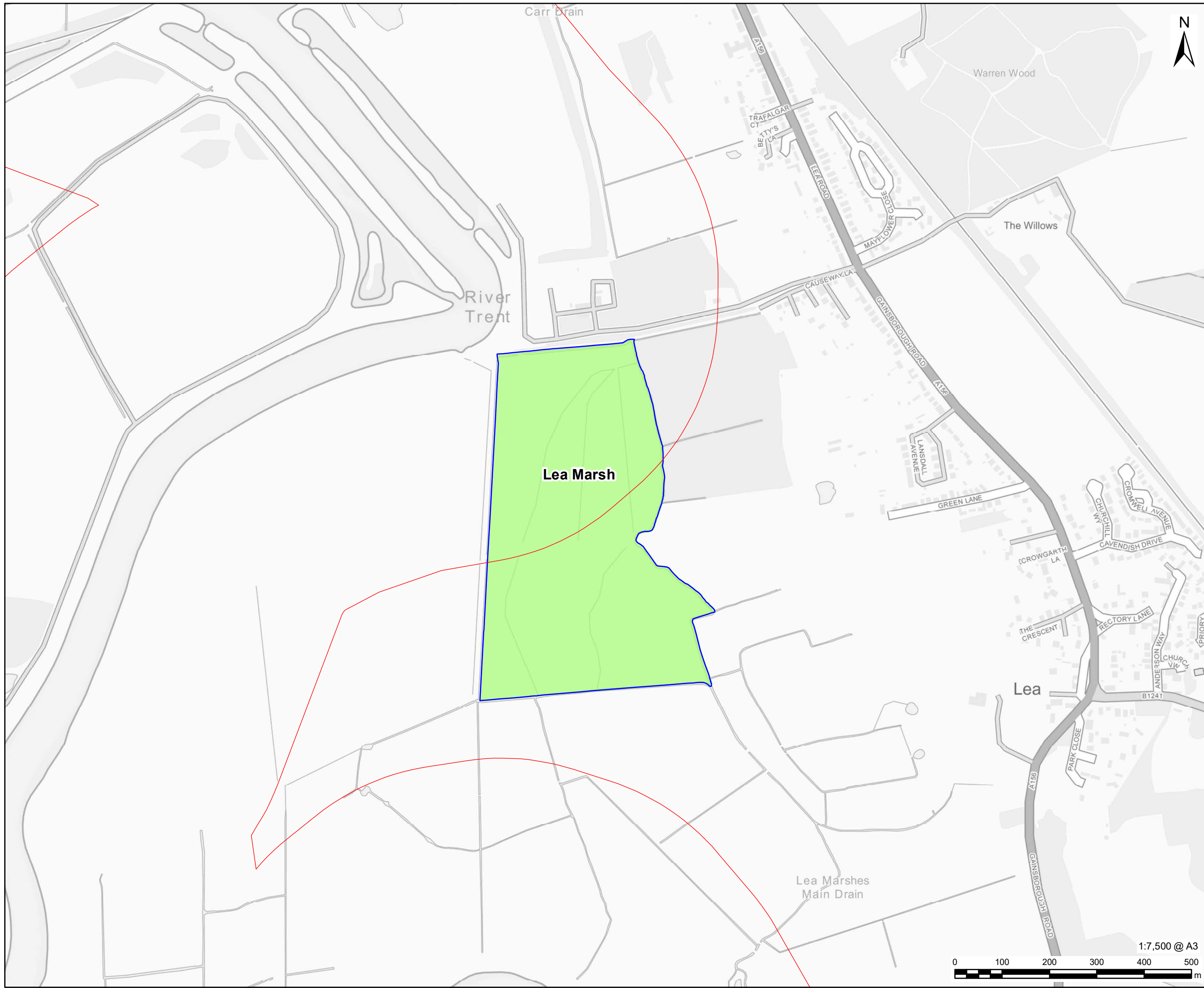
**FIGURE TITLE**  
Biodiversity Net Gain Baseline:  
Fledborough Holme (LWS)



**FIGURE NUMBER**  
Figure 1 - Sheet 24 of 27

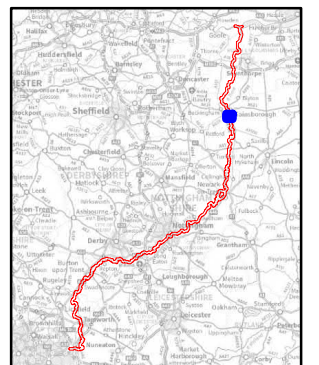
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**LEGEND**

	Wetland Habitat Study Area
	500m Study Area
	Coastal and Floodplain Grazing Marsh
	Lowland Meadow
	Wetland Mosaic



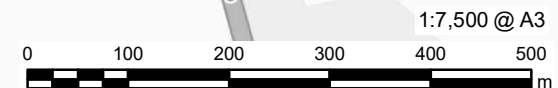
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**PROJECT NUMBER**  
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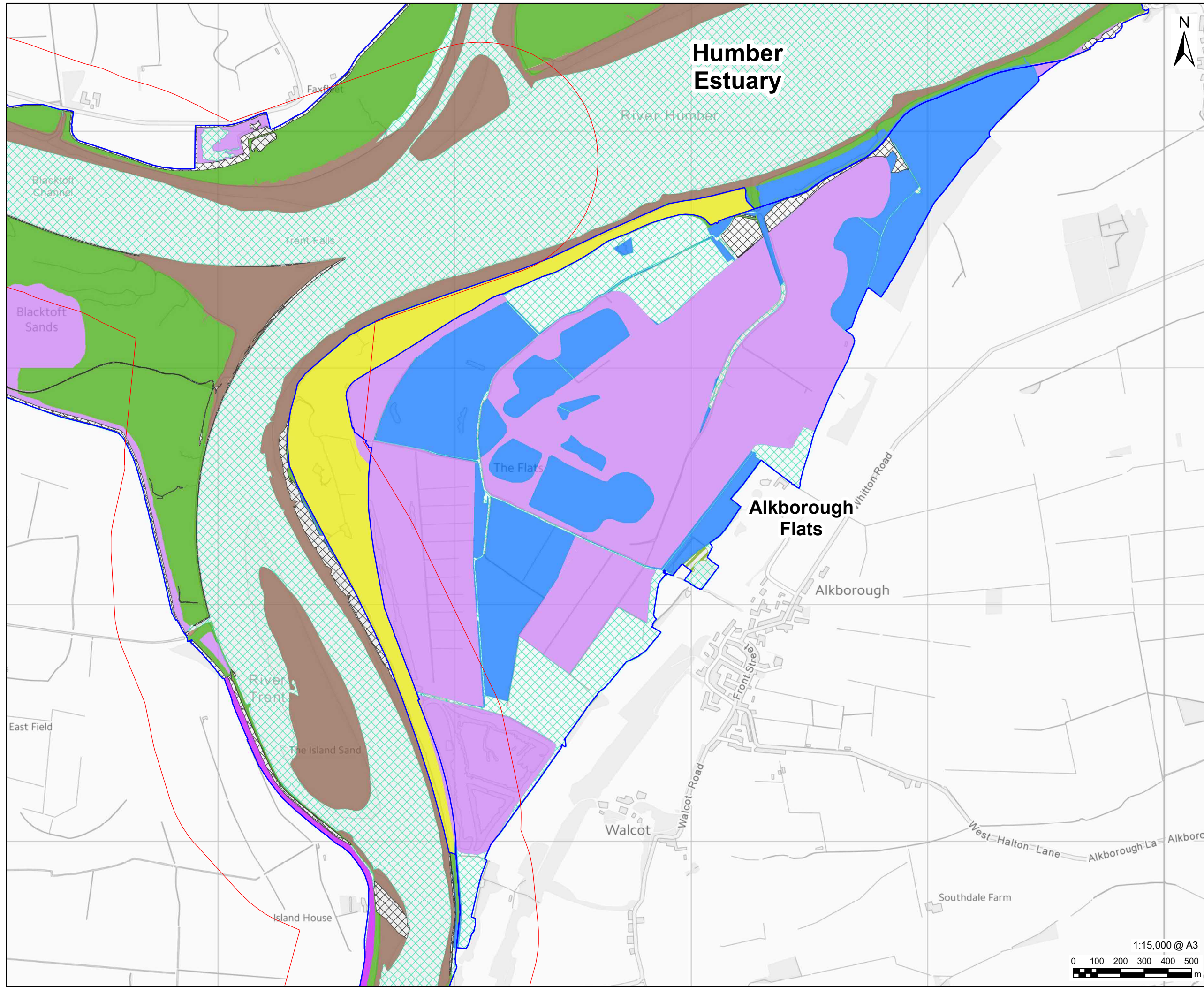
**FIGURE TITLE**  
Biodiversity Net Gain Baseline:  
Lea Marsh (SSSI)

**FIGURE NUMBER**  
Figure 1 - Sheet 25 of 27



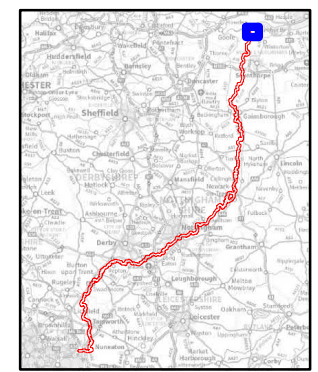
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**LEGEND**

-  Wetland Habitat Study
-  500m Study Area
-  Coastal and Floodplain Grazing Marsh
-  Good Quality Semi-improved Grassland
-  Deciduous Woodland
-  Coastal Saltmarsh
-  Lowland Fens
-  Lowland Calcareous Grassland
-  Mudflat
-  Reedbed
-  Saltmarsh
-  Wetland Mosaic
-  No Main Habitat But Additional Habitats Present



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**ISSUE PURPOSE**

FINAL

**PROJECT NUMBER**

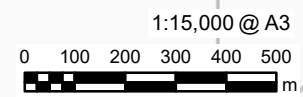
60641557

**FIGURE TITLE**

Biodiversity Net Gain Baseline:  
Alkborough Flats (LWS)

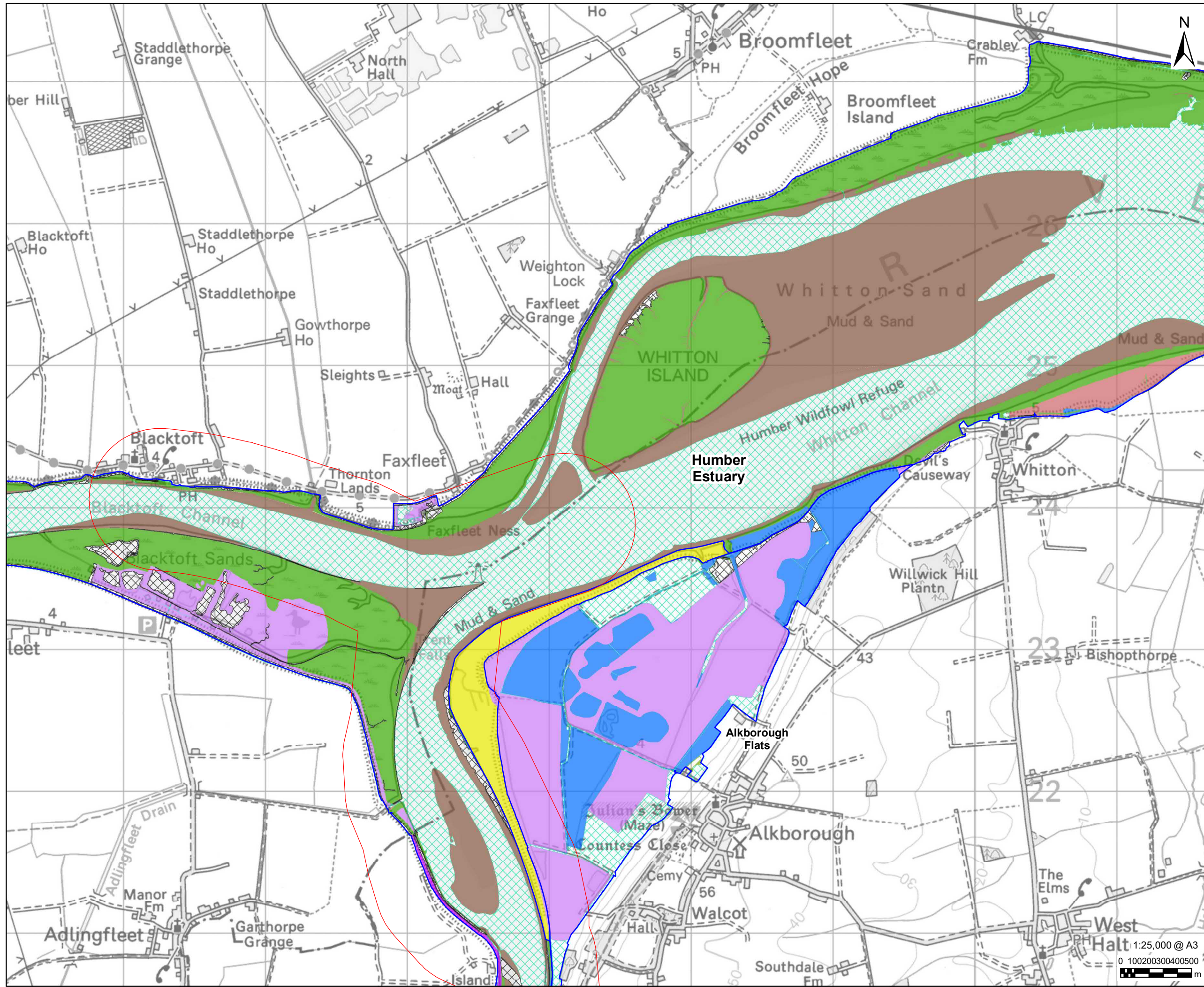
**FIGURE NUMBER**

Figure 1 - Sheet 26 of 27



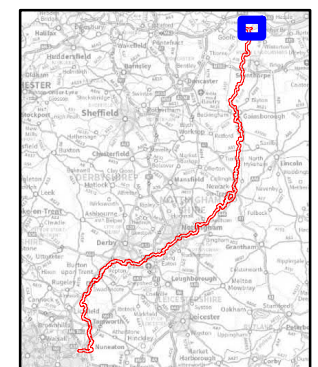
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**LEGEND**

- Wetland Habitat Study
- 500m Study Area
- Coastal and Floodplain Grazing Marsh
- Good Quality Semi-improved Grassland
- Deciduous Woodland
- Coastal Saltmarsh
- Lowland Fens
- Lowland Calcareous Grassland
- Mudflat
- Reedbed
- Saltmarsh
- Wetland Mosaic
- No Main Habitat But Additional Habitats Present



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**ISSUE PURPOSE**

FINAL

**PROJECT NUMBER**

60641557

**FIGURE TITLE**

Biodiversity Net Gain Baseline:  
Humber Estuary (SSSI), Alkborough  
Flats (LWS)

**FIGURE NUMBER**

Figure 1 - Sheet 27 of 27

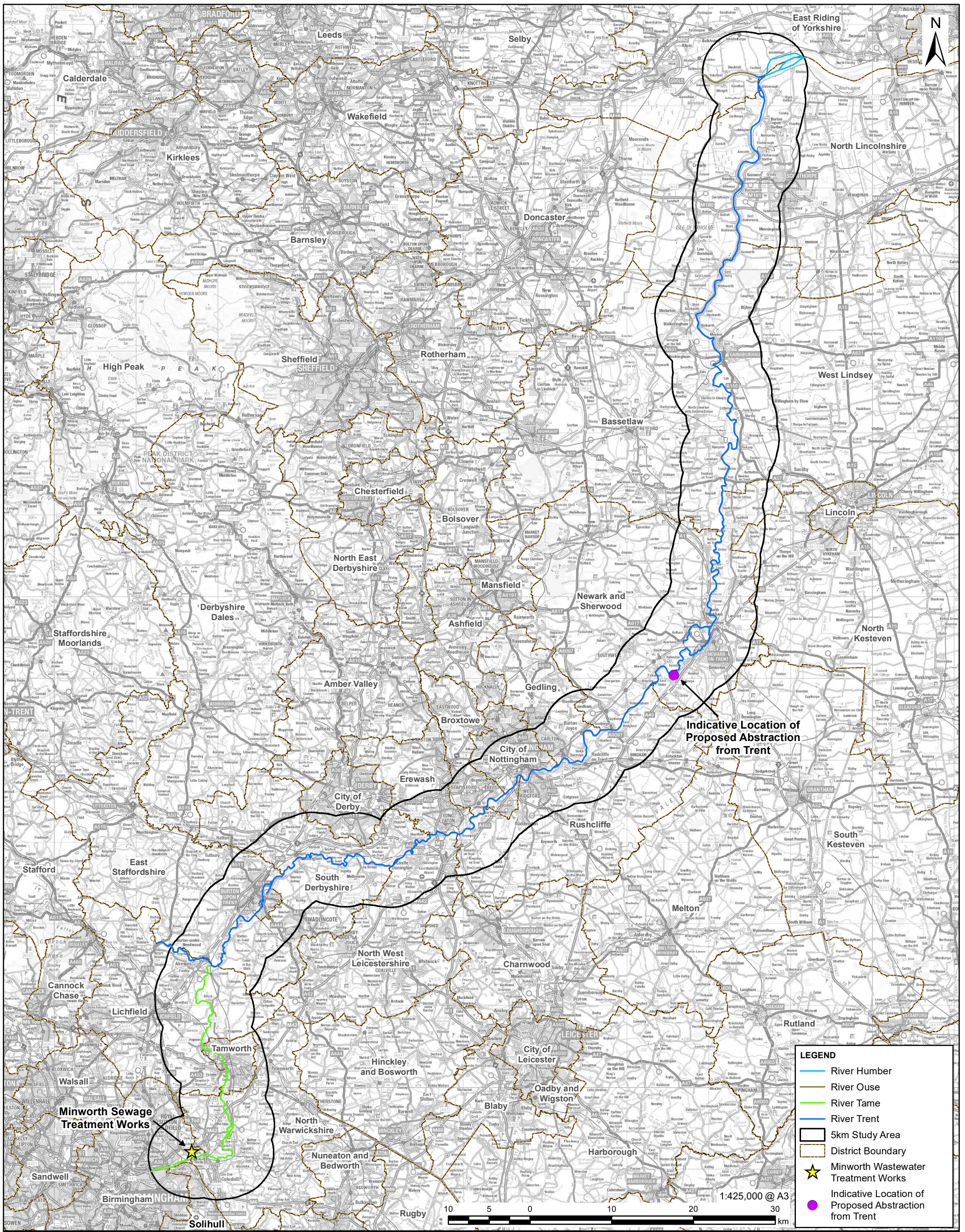
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## A.3 Annex A.3: Figure 2 Natural Capital Study Area





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**CLIENT**  
Affinity Water

**PROJECT**  
Tame and Trent  
Environmental Assessments,  
Gate 2. C-03835

**PROJECT NUMBER**  
60669746

**ISSUE PURPOSE**  
FINAL

**FIGURE TITLE**  
Natural Capital and BNG Assessment –  
Extent of Nat Cap Assessment

**FIGURE NUMBER**  
Appendix F Figure 2

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