11 TERRESTRIAL ECOLOGY

11.1 Introduction

This section of the EIA Report considers the following potential environmental impacts:

- impacts to nature conservation designated sites;
- direct loss of habitat; and,
- death, injury or disturbance of legally protected and/or notable species.

As reported in **Section 3**, invasive species have been identified within the landward parts of the proposed scheme footprint, namely Japanese rose and Japanese knotweed. **Section 3** also defines the works which are proposed to manage the presence of such invasive species and minimise the risk of them spreading. Potential impacts associated with invasive species are therefore not considered further within this section of the EIA Report.

11.2 Policy and consultation

Information on the relevance of the legislation, planning policy and guidance is presented in **Section 4** of this EIA Report. The information presented in this section relates to terrestrial ecology only.

11.2.1 Policy

Natural Environment White Paper (2011)
The paper was the first White Paper produced by the Government in 20 years. The paper contains plans to reconnect nature, connect people and nature for better quality of life and capture and improve the value of nature.

Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services
The Strategy sets out how England will implement the 2010 Aichi Biodiversity Targets, the European Commission's 2011 EU Biodiversity Strategy and the recommendations of the 2011 Natural Environment White Paper. It contains the following relevant targets:

- Better wildlife habitats with 90% of priority habitats in favourable or recovering condition and at least 50% of SSSIs in favourable condition, while maintaining at least 95% in favourable or recovering condition.
- More, bigger and less fragmented areas for wildlife, with no net loss of priority habitat and an increase in the overall extent of priority habitats by at least 200,000 ha.
- By 2020, at least 17% of land and inland water in England, especially areas of importance for biodiversity and ecosystem services, conserved through effective, integrated and joined up approaches to safeguard biodiversity and ecosystem services including through management of our existing systems of protected areas and the establishment of nature improvement areas.
- Restoring at least 15% of degraded ecosystems as a contribution to climate change mitigation and adaptation.
- By 2020, we will see an overall improvement in the status of our wildlife and will have prevented further human-induced extinctions of known threatened species.
- By 2020, significantly more people will be engaged in biodiversity issues, aware of its value and taking positive action.

Table 11.1 provides detail on key pieces of International and UK legislation which are relevant to terrestrial ecology.

Table 11.1 Key international and UK legislation relevant to ecology and nature conservation

Legislation	Relevance
The Conservation of Habitats and Species Regulations 2017 (or 'The Habitats Regulations 2017') (Conservation of Habitats and Species Regulations, 2017)	These Regulations provide protection for specific habitats listed in Annex I and species listed in Annex II of the Habitats Directive. The Directive sets out decision making procedures for the protection of Special Areas of Conservation (SAC) and Special Protection Areas (SPA), implemented in the UK through The Conservation of Habitats and Species Regulations 2017. The Regulations make it an offence (subject to exceptions) to deliberately capture, injure, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 5. The Regulations require competent authorities to consider or review planning permission, applied for or granted, affecting a European site, and, subject to certain exceptions, restrict or revoke permission where the integrity of the site would be adversely affected.
The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.	Makes changes to the Conservation of Habitats and Species Regulations 2017 following the UK's exit from the European Union (EU).
Wildlife and Countryside Act 1981 (as amended) (WCA, 1981)	This Act makes it an offence (subject to certain exceptions) to intentionally: kill, injure, or take any wild bird; take, damage or destroy the nest of any wild bird while that nest is in use or being built; and take or destroy an egg of any wild bird. The Act makes it an offence to intentionally kill, injure or take any animal listed in Schedule 5 of the act and protects occupied and unoccupied places used for shelter or protection by such animals. The Act makes it an offence (subject to exceptions) to intentionally pick, uproot or destroy any wild plant listed in Schedule 8 of the Act. The Act makes it an offence to plant or otherwise cause to grow any non-native, invasive species listed under Part 2 of Schedule 9 of the Act. The Act makes provision for the notification and confirmation of Sites of Special Scientific Interest (SSSI).
The Protection of Badgers Act 1992 (Protection of Badgers Act, 1992)	The Act makes it an offence to wilfully kill, injure or take, or attempt to kill, injure or take a badger *Meles meles*; and to cruelly ill-treat a badger. The Act makes it an offence to intentionally or recklessly damage, destroy or obstruct a badger sett, or to disturb a badger whilst in a sett.
Natural Environment and Rural Communities (NERC) Act 2006 (NERC, 2006)	Section 41 of the Act requires the Secretary of State (SoS) to compile a list of habitats and species of principal importance for the conservation of biodiversity in England (herein 'S41 species'). Decision makers of public bodies, in the execution of their duties, must have regard to the conservation of biodiversity in England, and the list is intended to guide them.
The Hedgerow Regulations 1997 (Hedgerow Regulations, 1997)	The Regulations make it an offence to remove or destroy certain hedgerows without permission from the local planning authority and the local planning authority is the enforcement body for such offences.
Countryside and Rights of Way Act (CRoW)2000 (CRoW, 2000)	The Act amends the law relating to public rights of way including making provision for public access on foot to certain types of land. Amendments are made in relation to SSSIs to improve their management and protection, as well as to the Wildlife and Countryside Act 1981, to strengthen the legal protection for threatened species.

11.2.2 Guidance

The ecological impact assessment presented below has been based upon the following guidance and standards:

- Chartered Institute of Ecology and Environmental Management (CIEEM) (CIEEM, 2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal;
- British Standard 42020:2013 – Biodiversity. Code of Practice for planning and development;
- Construction Industry Research and Information Association (CIRIA) C648 (2006) Control of water pollution from linear construction projects (CIRIA, 2006); and,
- CIRIA Guidance note C692 Environmental Good Practice on Site Guide (3rd Edition – CIRIA, 2010).

The following species-specific guidance and standards have been used during the assessment process:

- Standing advice on protected species (bats (all species), great crested newts *Triturus cristatus*, badgers, water voles *Arvicola amphibius*, otters *Lutra lutra*, reptiles, protected plants, invertebrates, white-clawed crayfish *Austropotamobius pallipes*, ancient woodlands and veteran trees) (Natural England, 2015);
- British Standard 5837: 2012 – Trees in relation to design, demolition and construction;
- Bat Conservation Trust and Institute of Lighting Engineers (2018) Bats and Artificial Lighting in the UK (ILE, 2018);
- The Water Vole Mitigation Handbook (The Mammal Society Guidance Series) (Dean et al, 2016);
- Reptile Habitat Management Handbook (Edgar et al, 2010);
- Great Crested Newt Mitigation Guidelines (English Nature, 2001);
- Herpetofauna Worker's Manual (Joint Nature Conservation Committee (JNCC), 2003);
- Otters: surveys and mitigation for development projects. Natural England Standing Advice (Natural England, 2014);
- Badgers: surveys and mitigation for development projects. Natural England Standing Advice (Natural England, 2015);
- Bats: surveys and mitigation for development projects. Natural England Standing Advice (Natural England, 2015);
- Great crested newts: surveys and mitigation for development projects. Natural England Standing Advice (Natural England, 2015);
- Invertebrates: surveys and mitigation for development projects. Natural England Standing Advice (Natural England, 2015);
- Reptiles: surveys and mitigation for development projects. Natural England Standing Advice (Natural England, 2015);
- Water voles: surveys and mitigation for development projects. Natural England Standing Advice (Natural England, 2015);
- Water Vole Conservation Handbook, 3rd Edition (Strachan and Moorhouse, 2011); and,
- Great Britain (GB) Non-native Species Information (GB Non-native secretariat, 2015).

11.2.3 Consultation

To inform this Ecological Impact Assessment (EcIA), Tees Valley Combined Authority has undertaken planning consultation with relevant stakeholders. Consultation responses relevant to terrestrial ecology are presented in **Table 11.2**.

Table 11.2 Consultation comments and responses

Date	Comment	Response
24/07/2020	Natural England advised on Priority Habitat as identified on Section 41 list of the Natural Environmental and Rural Communities (NERC) Act 2006, noting that the development will result in a loss of open mosaic, lowland calcareous grassland, open waters, broad leaved woodland, coastal saltmarsh, intertidal mud and reedbed priority habitats, which will be subsequently mitigated for through measures in the forthcoming Environmental and Biodiversity Strategy for the wider South Tees Development Corporation area.	Terrestrial habitats and associated species present within the footprint of the proposed scheme are detailed in **Section 11.5.**
	Natural England advised reference to their standing advice on Protected Species	As detailed in **Section 11.2**, the Natural England standing advise relevant to the proposed scheme has been used to inform this EcIA.
	Natural England requested considering the impacts of the proposed development on any local wildlife or geodiversity sites, in line with paragraphs 171 and 174 of the NPPF and any relevant development plan policy.	Impacts on Local Wildlife Sites (LWS) are considered in **Section 11.5.**
	Natural England requested consideration be given to the potential environmental value of brownfield sites, often found in urban areas and former industrial land, including open mosaic habitat.	Open mosaic habitat has not been recorded within the footprint of the proposed scheme during the surveys undertaken to date. The habitats and species that have been recorded within the footprint of the proposed scheme are assessed in **Section 11.5**.
	Natural England advised following the mitigation hierarchy as set out in paragraph 175 of the NPPF, with consideration for off-site measures where onsite measures are not possible.	STDC is in the process of developing a South Tees Regeneration Masterplan Environment & Biodiversity Strategy (the Strategy), which will define the works required to offset the loss of habitat arising as a result of works being proposed by STDC (including the proposed scheme which is the subject of this report). The extent and location of compensatory habitat creation and enhancements will be agreed with Natural England and RCBC. It is anticipated that the measures outlined in the Strategy will mean that the proposed scheme results in a biodiversity net gain.
14/08/2020	Environment Agency advised the following on Biosecurity - Strict biosecurity measures should be implemented to avoid the importing of non-native invasive species. Equipment, plant and PPE brought to site should be clean and free of material and vegetation. To ensure measures are implemented, it is recommended biosecurity toolbox talks are given to all site staff and rigorous inspections are undertaken of all equipment delivered to site, following the Check Clean and Dry campaign.	Biosecurity protocols are discussed in **Section 11.5**.

11.3 Methodology

11.3.1 Study area

The study area for this section of the EIA Report comprises the area which has the potential to be both directly and indirectly impacted by the proposed scheme. In this case, the maximum extent of the potential impact has been determined to be the area over which the potential effects of the proposed scheme on terrestrial ecology receptors could occur. Different study areas have been used for different receptors (**Table 11.3**) depending on their sensitivity and their habitat preferences. These study areas were selected according to standard industry guidance (CIEEM, 2018), as well as using professional judgement and experience.

Table 11.3 Study areas used for terrestrial ecology receptors considered in this EIA Report

Data/survey	*Study area*
Protected and notable species (excluding great crested newts, birds and bats)	Within and up to 2km from the proposed scheme footprint.
Great crested newts	Within and up to 250m from the proposed scheme footprint.
Bats and birds	Within and up to 5km from the proposed scheme footprint.
Statutory and non-statutory designated sites	Within and up to 2km from the proposed scheme footprint.
UK Habitats of Principle Importance (UKHIP) and Forestry habitats	Within and up to 2km from the proposed scheme footprint.
Statutory sites and associated impact risk zones (IRZ)	Within and up to 2km from the proposed scheme footprint.
Extended Phase 1 Habitat Survey	Within and up to 50m from the proposed scheme footprint.

11.3.2 Methodology used to describe the existing environment

11.3.2.1 Desk study

A desk study was undertaken to obtain information on terrestrial ecology receptors. The data sources that have been used to inform this EcIA are summarised in **Table 11.4**.

Table 11.4 Summary of data sources used to inform this EcIA

Data source	*Date reviewed*	*Data contents*	*Coverage*
Joint Nature Conservation Committee (JNCC)	July 2020	European designated sites (SPA, SAC, Ramsar sites)	Within and up to up to 2km from the proposed scheme footprint.
JNCC/MAGIC Natural England	July 2020	UK designated sites (SSSI), National Nature Reserve (NNR), Local Nature Reserve (LNR)	Within and up to up to 2km from the proposed scheme footprint.
JNCC/MAGIC Forestry Commission	July 2020	UK Habitats of Principle Importance, Ancient Woodland, Woodland categories	Within and up to up to 2km from the proposed scheme footprint.

Data source	Date reviewed	Data contents	Coverage
Environmental Records Information Centre North East (ERIC NE)	May 2020	Locally designated sites (LWS). Protected and notable species including: • Wildlife and Countryside Act 1981 Schedules 1, 5, 8 & 9; • The Conservation of Habitats & Species Regulations 2017 Schedules 2 & 5; • Protection of Badgers Act 1992; • Bonn Convention Appendix 1 & 2; • Bern Convention Annex 2, 4, & 5; • Habitats Directive Annex 2, 4 & 5; • NERC Act 2006 Section 41 species; • UK BAP (Biodiversity Action Plan) species (both local and national); • IUCN (International Union for Conservation of Nature), Red List Species; • Nationally Notable species; • Locally rare species.	Within and up to up to 2km (5km for bats and birds) from the proposed scheme footprint.
Ordnance Survey (OS)	July 2020	Large-scale mapping to determine the presence of ponds that may be suitable for great crested newts.	Within and up to up to 250m from the proposed scheme footprint.

11.3.2.2 Site specific surveys

An Extended Phase 1 Habitat Survey (EP1HS) was undertaken in 2019 (on behalf of Arup as part of the adjacent landside EIA development) and 2020 (for the proposed scheme which is subject of this report) by the Industry Nature Conservation Association (INCA). The footprint surveyed during the 2019 EP1HS overlapped with the proposed scheme footprint, and this data has therefore been used to inform the baseline. The 2020 EP1HS recorded the broad habitat types within the proposed scheme footprint and up to 50m from its boundaries. The potential for and/or evidence of protected or otherwise notable species to be present within the proposed scheme footprint was also noted as part of the EP1HS.

Both the 2019 and 2020 EP1HS was undertaken by Ian Bond and Mike Leaky from INCA, who are both experienced ecologists and competent botanists. The habitats were described using the Joint Nature Conservation Committee (JNCC) Phase 1 habitat survey methodology (JNCC, 2010) and the UK Habitat Classification Version 1.1 (Butcher *et al*, 2020). The habitat assessments were confined to the terrestrial areas within the proposed scheme footprint (they did not extend into the intertidal area).

The findings from both the 2019 and 2020 EP1HS have been used to establish the baseline conditions that are presented in **Section 11.4** and in turn used to inform the EcIA that has been undertaken and presented in **Section 11.5** and **Section 11.6**.

11.3.3 EcIA methodology

The EcIA methodology for this section of the report is based on the Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (CIEEM, 2018). These guidelines aim to predict the residual impacts on important ecological features affected, either directly or indirectly by a development, once all the appropriate mitigation has been implemented.

The approach to determining the significance of an impact follows a systematic process for all impacts. This involves identifying, qualifying and, where possible, quantifying the sensitivity and value of all ecological receptors and magnitude of effects which have been scoped into this assessment. Using this information, the significance of each potential impact has been determined. Each of these steps is set out in the remainder of this section.

The EcIA has used professional judgement to ensure the assessed significance level is appropriate for each individual receptor, taking account of local values for biodiversity to avoid a subjective assessment wherever possible, as per the CIEEM guidelines. As a result, the assessed significance level may not always be directly attributed to the guidance matrix detailed below.

11.3.3.1 Importance

The first stage of an EcIA is determining the 'importance' of ecological features or 'receptors'. CIEEM identifies the important ecological features as those key sites, habitats and species which have been identified by European, national and local governments and specialist organisations as a key focus for biodiversity conservation in the UK. These include:

- Statutory and non-statutory designated sites for nature conservation;
- Species occurring on national biodiversity lists;
- UK HPIs; and,
- Red listed, rare or legally protected species.

Importance is also qualified by the geographic context of an ecological receptor; for example, a species which may not be recognised on a national biodiversity list may be locally in decline, and therefore its local importance would be greater than its national importance in this instance.

For this EcIA, the guidelines outlined in **Table 11.5** will be followed to provide the relative importance of different ecological features.

CIEEM places the emphasis on using professional judgement when considering importance of ecological receptors, based on available guidance, information and expert advice (CIEEM, 2016). Various aspects of ecological importance should be taken into account, including designations, biodiversity value, potential value, secondary or supporting value, social value, economic value, legal protection and multi-functional features.

Table 11.5 Definition of terms relating to receptor value and/or importance

Ranking	*Habitats*
Very high	Habitats or species that form part of the cited interest within an internationally protected site, such as those designated under the Conservation of Habitats and Species Regulations (e.g. SPAs) or other international convention (e.g. Ramsar site). A feature (e.g. habitat or population) which is either unique or sufficiently unusual to be considered as being one of the highest quality examples in an international/national context, such that the site is likely to be designated as a site of European importance (e.g. SAC or SPA).
High	Habitats or species that form part of the cited interest within a nationally designated site, such as a SSSI or NNR. A feature (e.g. habitat or population) which is either unique or sufficiently unusual to be considered as being one of the highest quality examples in a national context for which the site could potentially be designated a SSSI. Species that are protected under the Wildlife and Countryside Act 1981 (as amended) or Conservation of Habitats and Species Regulations (2017).

Ranking	Habitats
	Presence of habitats or where the action plan states that all areas of representative habitat or individuals of the species should be protected.
Medium	A feature (e.g. habitat or population), which is either unique or sufficiently unusual to be considered as being of nature conservation value from a county to regional level. Habitats or species that form part of the cited interest of an LNR, or some local-level designated sites, such as a local wildlife site (LWS), also referred to as a non-statutory Site of Importance for Nature Conservation or the equivalent (e.g. Ancient Woodland). Presence of habitats or species listed under Natural Environment and Rural Communities (2006) Schedule 41. LBAP habitats or species, where the action plan states that all areas of representative habitat or individuals of the species should be protected.
Low	A feature of importance at local level. A feature (e.g. habitat or population) that is of nature conservation value in a local context only, with insufficient value to merit a formal nature conservation designation.
Negligible	A feature of importance at a local level. Commonplace feature of little or no habitat/historical significance. Loss of such a feature would not be seen as detrimental to the ecology of the area.

11.3.4 Sensitivity

Sensitivity is not an inherent characteristic of a receptor or resource. Receptor or resource sensitivity is the degree to which it is tolerant of, adaptable to and able to recover from a change in its environment. Therefore, in addition to considering the importance/quality/value of the affected receptor or resource, its response (or sensitivity) to a particular impact is also considered. This is typically informed by literature review and the baseline environment evidence base. Detail regarding the definition of terms relating to receptor sensitivity is provided in **Table 11.6**.

Table 11.6 Definition of terms relating to receptor sensitivity

Ranking	Tolerance	Adaptability	Recoverability / reversibility
High	Receptor unable to tolerate effect resulting in permanent change it its abundance or quality.	Receptor unable to avoid impact.	Receptor unable to recover resulting in permanent or long-term change (e.g. > 10 years).
Medium	Receptor has some ability to tolerate this effect but a detectable change (e.g. a change in distribution) will occur.	Receptor has some ability to avoid the most negative consequences of the impact or can partially adapt to it (e.g. by moving to other suitable areas).	Receptor recovers to an acceptable status over the short term to medium term (e.g. 1-10 years).
Low	Receptor unaffected.	Receptor can completely avoid the impact or adapt to it with no detectable changes.	Receptor recovers full within the short-term (e.g. 1 year).

11.3.5 Magnitude

The magnitude of the impact is assessed according to:

- the extent of the area subject to a predicted impact;
- the duration the impact is expected to last prior to recovery or replacement of the resource or feature;

- whether the impact is reversible, with recovery through natural or spontaneous regeneration, or through the implementation of mitigation measures or irreversible, when no recovery is possible within a reasonable timescale or there is no intention to reverse the impact; and,
- the timing and frequency of the impact, i.e. conflicting with critical seasons or increasing impact through repetition.

Table 11.7 summarises the definitions of magnitude that have been used for the ecological receptors.

Table 11.7 Definition of terms relating to magnitude of an impact

Ranking	Habitat	Environmental factors (e.g. presence, ambient air quality, noise)
High	Widespread and/or permanent disturbance or loss of a habitat, threatening the long-term viability or function of the habitat.	Change over a large area that lasts over the medium to long term, likely to cause secondary effects on ecology and/or routine exceedance of benchmark limits. A long-term physical change that affects a large area or introduces a permanent physical barrier.
Medium	Localised disturbance and/or loss of habitat that does not threaten the long-term viability or function of the habitat.	Temporary or localised change and/or occasional exceedance of benchmark limits. A physical change in the medium term over a relatively large area.
Low	Minimal disturbance and/or loss of habitat, such that there is no loss of viability or function of the habitat.	Slight change expected over a limited area and returning to background levels within a few metres or tens of metres. No exceedances of benchmark limits. A temporary and localised physical change/source of disturbance.
Negligible	Immeasurable, undetectable or within the range of normal natural variation change to the extent and condition of habitat.	Change is within the normal range of natural variation.

11.3.6 Duration

The definitions of duration used within this EcIA are dependent on the individual ecological receptor, and how sensitive it is to effects over different timescales. However, in general terms the following definitions have been used:

- Short term – effects which at most occur over a part of – or over a part of a key period of – a species' active season or a habitat's growing season, i.e. typically effects which occur over a matter of days or weeks.
- Medium term – effects which occur over the full duration of a species' active season or a habitat's growing season, i.e. typically effects which occur over a matter of months or one year.
- Long term – effects which occur over the multiple active or growing seasons, i.e. typically effects which occur over more than one year.

11.3.7 Impact significance

Following the identification of receptor importance and magnitude of the effect, it is possible to determine the significance of the impact. Ecologically significant impacts are defined as:

> '*…impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution)*' (CIEEM 2016a).

Impacts are unlikely to be significant where features of low importance are subject to small scale or short-term effects. If an impact is not significant at the level at which the resource or feature has been valued, it may be significant at a more local level.

CIEEM recommends that the following factors are taken into account when determining significance for selected ecological receptors:

- Designated sites – is the proposed scheme and associated activities likely to undermine the site's conservation objectives, or positively or negatively affect the conservation status of species or habitats for which the site is designated, or may it have positive or negative effects on the condition of the site or its interest/qualifying features?
- Ecosystems – is the project likely to result in a change in ecosystem structure and function?
- Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area.
- Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area (CIEEM 2016a).

Following the identification of receptor importance and magnitude of effect, the significance of the impact has been considered using the matrix presented in **Table 11.8** below and knowledge of the ecological features affected.

The assessment of potential impacts has been undertaken assuming implementation of embedded mitigation and project commitments made as part of the design process. Where, following this assessment, likely significant impacts are identified, additional mitigation measures are then proposed. A final assessment of the residual impacts remaining following implementation of these additional mitigation measures is then made.
For the purposes of this assessment, any effects with a significance level of minor or less have been concluded to be not significant in terms of the EIA Regulations.

Table 11.8 Matrix used for the assessment of the significance of the effect

		Negative magnitude				**Beneficial magnitude**			
		High	**Medium**	**Low**	**Negligible**	**Negligible**	**Low**	**Medium**	**High**
Importance	**High**	Major	Major	Moderate	Minor	Minor	Moderate	Major	Major
	Medium	Major	Moderate	Minor	Minor	Minor	Minor	Moderate	Major
	Low	Moderate	Minor	Minor	Negligible	Negligible	Minor	Minor	Moderate
	Negligible	**Minor**	**Negligible**	**Negligible**	**Negligible**	**Negligible**	**Negligible**	**Negligible**	**Minor**

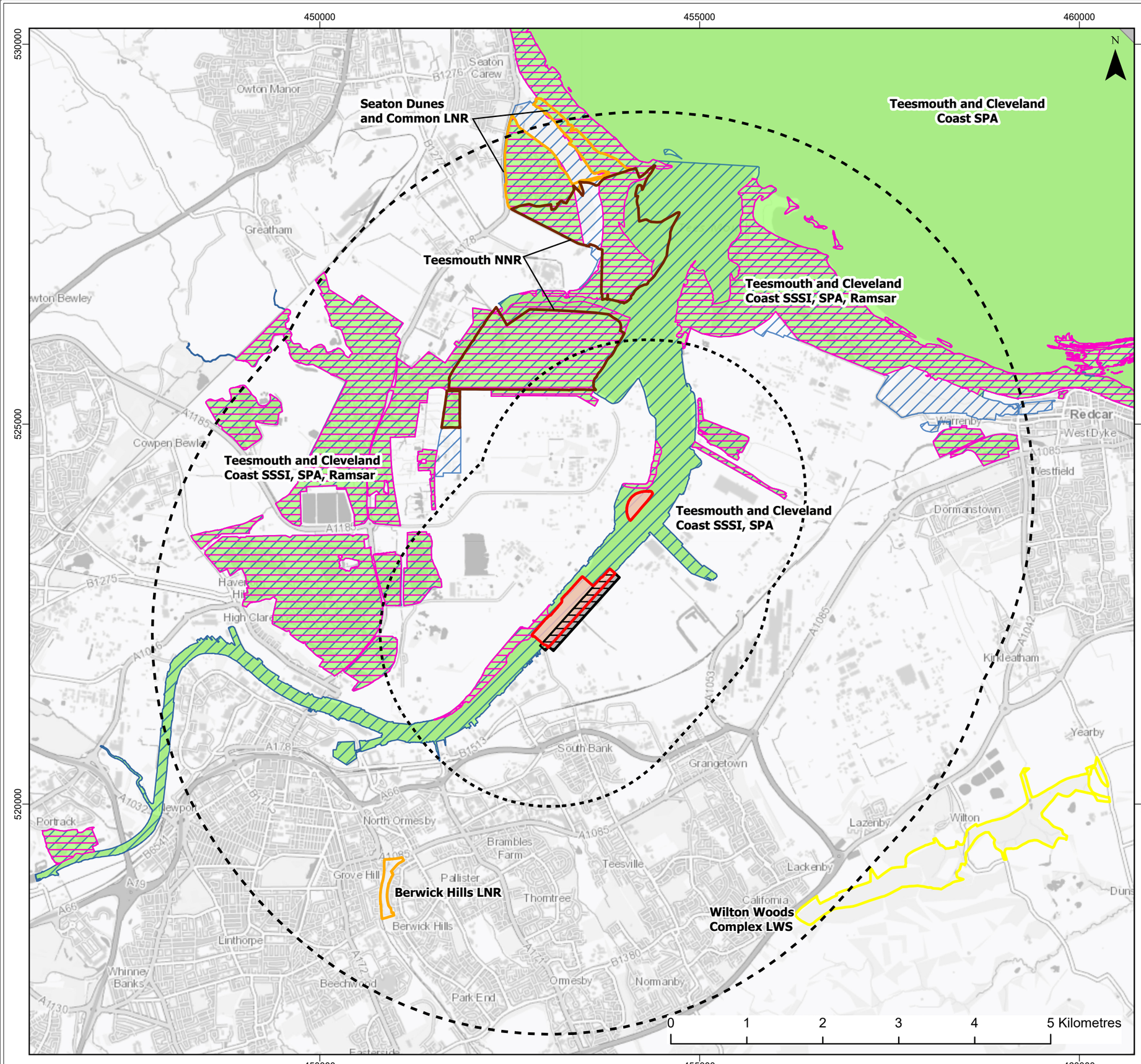
Following initial assessment, if the impact does not require additional mitigation (or none is possible) the residual impact will remain the same. If, however, additional mitigation is proposed there will be an assessment of the post-mitigation residual impact.

11.4 Existing environment

11.4.1 Designated sites

As shown on **Figure 11.1** and detailed in **Table 11.9**, there is one statutory designated site within 2km from the proposed scheme, namely the Teesmouth and Cleveland Coast SPA, SSSI and Ramsar site. Two LNRs, an NNR and an LWS are all present within the 5km buffer (detailed in **Table 11.9**).

As detailed in **Table 11.9**, some of the designated sites are protected for reasons which are not solely applicable to this section of the EIA Report (which concentrates on terrestrial ecology). Cross reference to the assessment presented in **Section 8**, **9**, **10** and **12** should be made to fully understand the significance of potential impacts to these sites.



Legend

- 5km Search Area
- 2km Search Area
- Proposed Dredge and Excavation Envelope (including side slopes)
- Proposed Quay Envelope
- Proposed Demolition Area
- Special Protection Area (SPA): Teesmouth and Cleveland Coast
- Sites of Special Scientific Interest (SSSI): Teesmouth and Cleveland Coast
- Ramsar Site: Teesmouth and Cleveland Coast
- National Nature Reserve (NNR): Teesmouth
- Local Nature Reserve (LNR)
- Local Wildlife Site (LWS)

Client:	Project:
Tees Valley Combined Authority	South Bank Quay

Title: **Designated Sites**

Figure: 11.1

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
0	27/10/2020	TC	CAS	A3	1:50,000

Co-ordinate system: British National Grid

Royal HaskoningDHV
Enhancing Society Together

ROYAL HASKONINGDHV
Marlborough House
Marlborough Crescent
Newcastle-upon-Tyne, NE1 4EE
+44 (0)191 211 1300
www.royalhaskoningdhv.com

Table 11.9 Nature conservation sites within 2km of the proposed scheme

Site name	Designation	Approximate distance from the proposed scheme footprint	Reason for designation
Teesmouth and Cleveland Coast	SPA	Within the footprint of the proposed scheme	The extensions to the Teesmouth and Cleveland Coast SPA were formally classified on 16 January 2020. This site supports internationally important population of breeding little tern *Sterna albifrons*, common tern *Sterna hirundo*, and pied avocet *Recurvirostra avosetta*. This site also supports internationally important population of non-breeding Sandwich tern *Thalasseus sandvicensis*, ruff *Calidris pugnax*, red knot *Calidris canutus* and common redshank *Tringa totanus*. This site is known to support an internationally important seabird assemblage, regularly used by more than 20,000 wintering waterbirds.
Teesmouth and Cleveland Coast	Ramsar	Immediately adjacent	The extensions to the Teesmouth and Cleveland Coast Ramsar site were formally classified on 16 January 2020. This site is designated as a Wetland of international importance under Ramsar criterion 5 for assemblages of international important numbers of waterbirds and Criterion 6 for regularly supporting 1% of the individuals in a population of more than one species of waterbird. This site is also designated for peak counts of common redshank in spring and autumn and wintering red knot.
Teesmouth and Cleveland Coast	SSSI	Within the footprint of the proposed scheme	Teesmouth and Cleveland Coast SSSI was formally adopted on 18 April 2019, expanding the previous extent of the same SSSI, and absorbing seven SSSIs previously present within the region Site incorporates a mosaic of coastal and freshwater habitats, with the following designated features: i. Jurassic geology; ii. Quaternary geology; iii. Sand dunes; iv. Saltmarshes; v. Breeding harbour seals *Phoca vitulina*; vi. A diverse assemblage of breeding birds of sand dunes, saltmarsh and lowland open waters and their margins; vii. Non-breeding shelduck *Tadorna tadorna*, shoveler *Spatula clypeata*, gadwall *Mareca strepera*, ringed plover *Charadrius hiaticula*, red knot, ruff, sanderling *Calidris alba*, purple sandpiper *Calidris maritima*, common redshank, and Sandwich tern; viii. An assemblage of more than 20,000 waterbirds during the non-breeding season; and ix. A diverse assemblage of invertebrates associated with sand dunes.
Teesmouth	NNR	1.5 km	Site is designated for its sand dunes, marsh habitats, and intertidal sand and mudflat habitats. The reserve is split into two main sections, namely North Gare and Seal Sands. North Gare is an area of dunes and grazing marsh, supporting lapwing *Vanellus vanellus* and curlew *Numenius arquata*. Seal Sands is one of the largest areas of intertidal mudflat along the North East England coastline. As reported in **Section 6**, the zone of influence in terms of hydrodynamic and sedimentary plume effects would not extend to these areas and therefore no impact on these features would occur.

Site name	Designation	Approximate distance from the proposed scheme footprint	Reason for designation
Seaton Dunes and Common	LNR	3.3 km	Seaton Common covers approximately 75ha and its primary importance is as a wet grassland which attracts vast numbers of passage migrants over winter and as a breeding ground for birds in the summer months. Seaton Dunes covers approximately 32ha and forms one of the largest sand dune systems between Lindisfarne and the Humber, with associated dune flora. As reported in **Section 6**, the zone of influence in terms of hydrodynamic and sedimentary plume effects would not extend to these areas and therefore no impact on these features would occur.
Berwick Hills	LNR	3.3 km	Berwick Hills contains wildflower meadows, woodlands and ponds.
Wilton Woods Complex	LWS	4.7 km	This is afforded protection as an Ancient Woodland.

11.4.2 Habitats

The Priority Habitats within and up to 2km of the proposed scheme footprint are shown on **Figure 11.2**. The only Priority Habitat within the proposed scheme footprint is reported as mudflat which is limited to the intertidal area and therefore discussed in detail in **Section 9.**

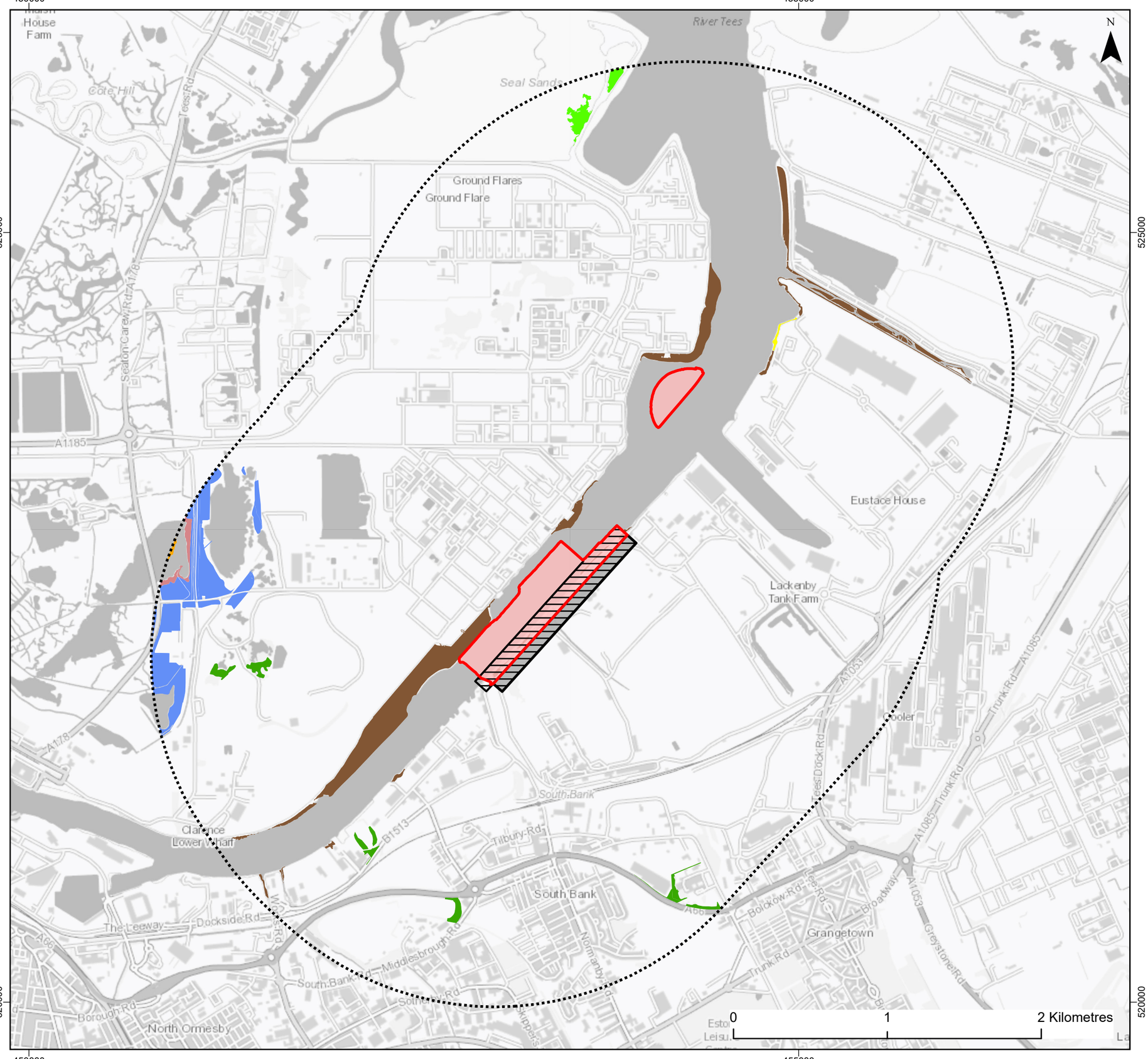
The EP1HS divided the terrestrial habitat within the proposed scheme footprint into habitat types which comprised areas noted to be similar in both their habitat type and condition. Habitats were recorded and mapped during the EP1HS, as shown on **Figure 11.3,** including the habitat data provided by Arup for the adjacent land EIA development. The main terrestrial habitat within the footprint of the Proposed Scheme was recorded as modified grassland, with some neutral grassland, ephemeral / ruderal and mixed scrub also present. Approximately one third of the proposed scheme footprint is classed as urban / developed land with a sealed surface and of no ecological value. Further information relating to each habitat is provided below and presented in **Table 11.10**.

Table 11.10 Areas of habitat within the proposed scheme footprint

Habitat type	Area (ha)
Grassland - Other modified grassland	4.69
Grassland - Other neutral grassland	1.33
Heathland and shrub - Mixed scrub	0.19
Other woodland, broadleaved	0.04
Sparsely vegetated land - Ruderal/Ephemeral	2.05
Urban - Developed land; sealed surface	4.64

UK Habitat Classification: g4 Modified Grassland; JNCC Habitat: Poor Semi-improved

This habitat type is assumed to be present where a layer of soil covers coal or other substrates. The EP1HS noted that circa 50% of the proposed scheme footprint comprises this habitat type. A series of mounds of tipped material line the side of the road. These were sparsely vegetated and therefore classified as artificial and unsealed surfaces.



Legend

- 2km Search Area
- Proposed Dredge and Excavation Envelope (including side slopes)
- Proposed Quay Envelope
- Proposed Demolition Area

Priority Habitat Inventory

- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Deciduous woodland
- Lowland fens
- Mudflats
- Saline lagoons
- No main habitat but additional habitats present

Client:	Project:
Tees Valley Combined Authority	South Bank Quay

Title: **Priority Habitats**

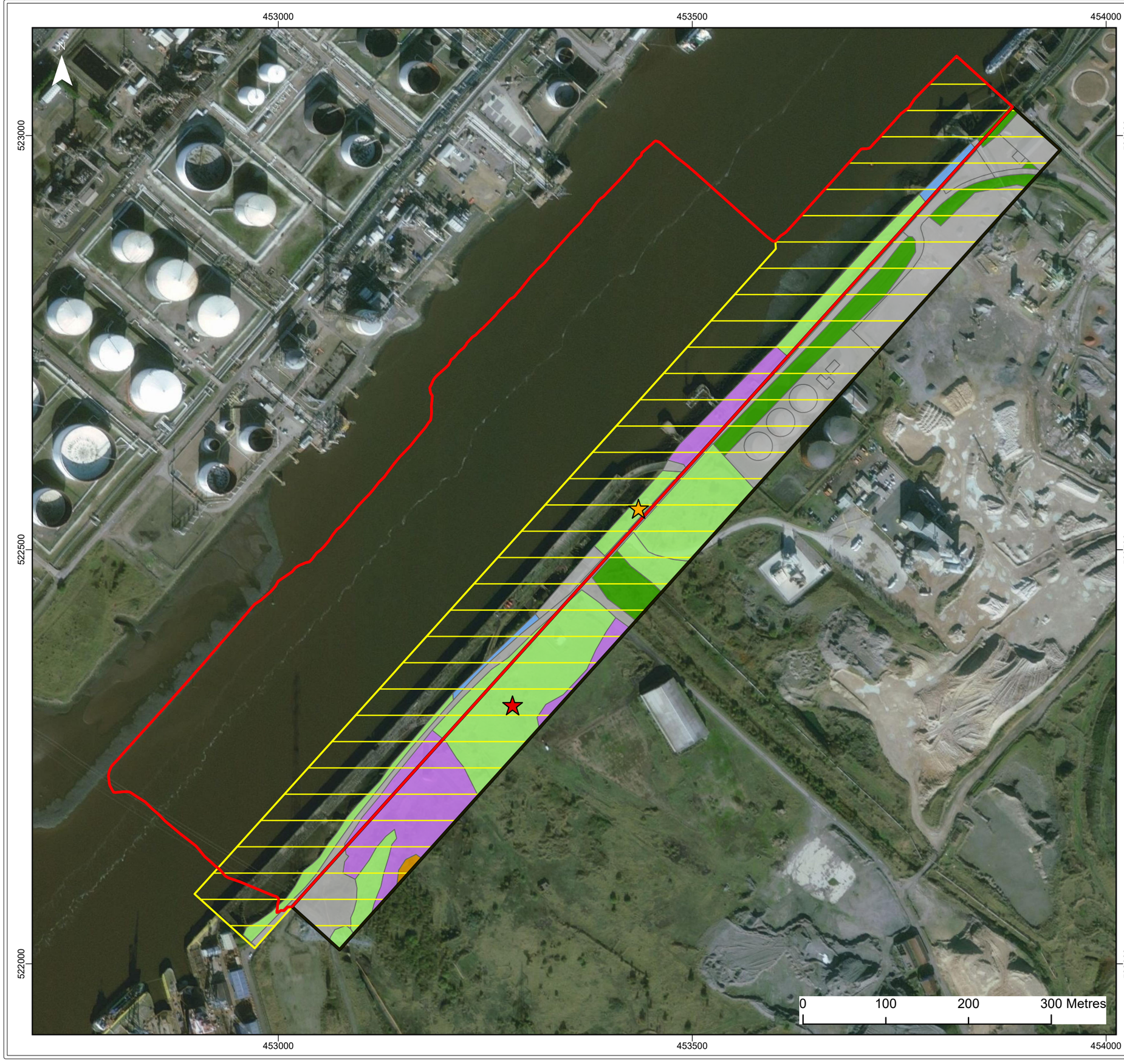
Figure: 11.2

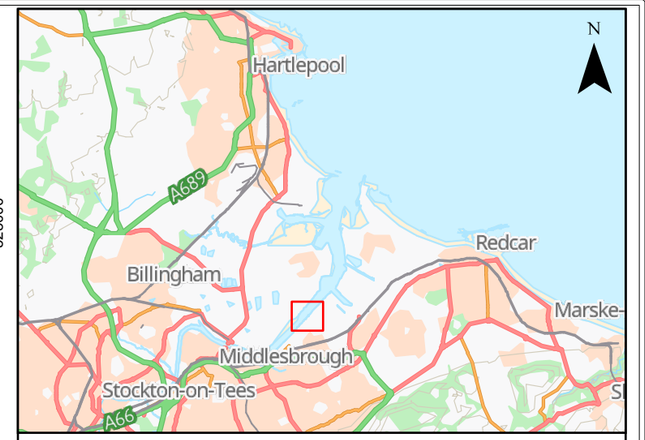
Revision:	Date:	Drawn:	Checked:	Size:	Scale:
0	27/10/2020	TC	CAS	A3	1:25,000

Co-ordinate system: British National Grid

Royal HaskoningDHV
Enhancing Society Together

ROYAL HASKONINGDHV
Marlborough House
Marlborough Crescent
Newcastle-upon-Tyne, NE1 4EE
+44 (0)191 211 1300
www.royalhaskoningdhv.com





Legend

- Proposed Dredge and Excavation Envelope (including side slopes)
- Proposed Quay Envelope
- Proposed Demolition Area

Habitat Types

- Grassland - Other modified grassland
- Grassland - Other neutral grassland
- Heathland and shrub - Mixed scrub
- Other woodland, broadleaved
- Sparsely vegetated land - Ruderal/Ephemeral
- Urban - Developed land; sealed surface
- Japanese Knotweed
- Japanese Rose

Client: Tees Valley Combined Authority

Project: South Bank Quay

Title: UK Habitat Survey Map (terrestrial habitats only)

Figure: 11.3

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
0	30/10/2020	TC	CAS	A3	1:4,500

Co-ordinate system: British National Grid

Royal HaskoningDHV
Enhancing Society Together

ROYAL HASKONINGDHV
Marlborough House
Marlborough Crescent
Newcastle-upon-Tyne, NE1 4EE
+44 (0)191 211 1300
www.royalhaskoningdhv.com

The key vegetation within this habitat was noted to be predominately false oat grass *Arrhenatherum elatius* (i.e. typically characteristic of MG1 habitat). Small areas of bramble *Rubus fructicosus* agg and bracken *Pteridium aquilinum* were also recorded, as was a scattering of tall ruderals such as creeping thistle *Cirsium arvense*, wild parsnip *Pastinaca sativa* common ragwort *Senecio jacobaea* and rosebay *Chamerion angustifolium*. Occasional areas of elder *Sambucus nigra*, and other young trees were also present. The sward was predominately species-poor although birds foot trefoil *Lotus corniculatus*, fennel *Foeniculum vulgare* and mouse eared hawkweed *Hieracium pilosella* were occasionally recorded throughout this Habitat.

There are two stands of Japanese rose *Rosa rugosa* bushes that were recorded at the time of the EP1HS. The locations of which are shown on **Figure 11.3**.

The habitat and species recorded are not considered to be of high ecological value and therefore modified grassland is concluded as being of **negligible ecological value**.

UK Habitat Classification: g3c Neutral Grassland; JNCC Habitat: Poor Semi-improved

A small amount of neutral grassland was recorded during the EP1HS; however, it was noted as being predominately species poor. Common floral species were recorded during the EP1HS and these were not considered to be of high ecological value and therefore the area of neutral grassland is concluded to be of **negligible ecological value**.

UK Habitat Classification h3h Mixed scrub; JNCC Habitat: Scattered scrub, occasional trees and neutral grassland

A mixture of scrub/young trees and grassland were present within the proposed scheme footprint, which are fringed by grassland. The key species noted during the EP1HS was black knapweed *Centaurea nigra*.

The habitat and species recorded are not considered to be of high ecological value and therefore mixed scrub habitat is concluded as being of negligible ecological value.

UK Habitat Classification: w1g7 Broadleaved woodland; JNCC Habitat: semi natural broadleaved woodland

The proposed scheme footprint includes the edge of an area of young broadleaved woodland. The woodland is almost exclusively birch *Betula sp*. and is thought to be the natural regenerative woodland of no more than 10 years old. No scrub layer is present. No ground layer species are present other than the remnants of typical brownfield flora in low abundance. No ancient woodland indicator species were noted at the time of the survey. Lowland mixed deciduous woodland is a Habitat of Principal Importance and it is considered that this habitat is of local importance and **low ecological value**. The remainder of the woodland lies within the footprint of the adjacent landside development EIA and is fully assessed as part of those proposals.

UK Habitat Classification: Sparsely vegetated land – Ephemeral/ Ruderal; JNCC Habitat: Ephemeral/ short perennial

The area of this habitat type comprised circa 50% grass cover (key species being red fescue *Festuca rubra)*.

A large number of brownfield indicator plants were recorded during the EP1HS, with the dominant species being Ladies bedstraw *Galium verum* and hedge bedstraw *Galium mollugo*. Other species such as vipers bugloss *Echium vulgare*, birds foot trefoil and stonecrop, *Sedum* spp were also recorded, albeit less frequent than others.

The habitat and species recorded are not considered to be of high ecological value and therefore ephemeral and ruderal habitat is concluded as being of **negligible ecological value**.

Existing South Bank Wharf
The South Bank Wharf which is proposed to be demolished as part of the proposed scheme was recorded to be largely devoid of vegetation to the extent that it was noted as being an artificial sealed surface. Areas of occasional shrub were also recorded within and surrounding the wharf structure.

Buildings
There are existing structures present within the proposed scheme footprint which would be demolished in advance of works commencing or following receipt of planning permission for the proposed scheme. Information relating to the ecological potential of these features is discussed in **Section 11.4.3**. It should be noted that in terms of buildings specifically, only the brick built electrical substation is proposed to be demolished as part of the proposed scheme.

11.4.3 Protected and notable species

Notable flora
No records of protected or notable plant species were identified from the desk study or recorded during the EP1HS. Consequently, these are considered to be absent and no further surveys and/or mitigation measures are required. Therefore, protected and/or notable flora is not considered further in this EcIA.

Bats
No records of roosting and/or foraging/commuting bats were identified during the desk study. However, habitats are present within and surrounding the proposed scheme footprint for which common species such as common pipistrelle *Pipistrellus pipistrellus* could use, if present, for foraging and commuting purposes.

The buildings and structures within the proposed scheme footprint are limited to sealed and open-sided metal structures, which have been assessed as being of negligible value for roosting bats due to the lack of potential roosting features. In addition, there are no mature trees within the proposed scheme footprint. Therefore, roosting bats are considered to be absent and no further surveys and/or mitigation measures for roosting bats are required. Therefore, roosting bats are not considered further in this EcIA.

The habitats within the proposed scheme footprint are limited in terms of them providing a food source for foraging/commuting bats. Therefore, the proposed scheme footprint is assessed as providing low potential to support foraging and commuting bats due to the invertebrate assemblage on the ephemeral / ruderal habitat. Consequently, it is considered that the bat assemblage of the proposed scheme footprint is of local value, for foraging and commuting bats, and limited to common bat species.

Badger
The desk study has shown no historical records of badger *Meles meles* within the proposed scheme footprint and its immediate surroundings.

The EP1HS did not record evidence of badger activity and/or presence within the proposed scheme footprint. Furthermore, it is considered unlikely that badgers are present as the habitats are dominated by unsuitable habitats as well as being surrounded by urban, industrial areas and main roads which would prevent badger colonising the area.

The habitat within the proposed scheme footprint would not support sett building and would also not provide a significant foraging resource for badgers.

Consequently, badgers are considered to be absent from the proposed scheme footprint and no further surveys and/or mitigation measures are required. Therefore, badgers are not considered further in this EcIA.

Water vole

Water voles *Arvicola amphibius* have not been recorded within or up to 2km from the proposed scheme footprint. Furthermore, there is no suitable habitat for water vole within the footprint of the proposed scheme and this species is considered to be absent. Therefore, no further surveys and/or mitigation measures are required, and water voles are not considered further in this EcIA.

Otter

Otters *Lutra lutra* have been recorded upstream of the proposed scheme footprint and along the River Tees. INCA recorded otter spraints within The Slems (approximately 1km from the proposed scheme footprint) during survey works for the adjacent land-side EIA in the summer of 2020.

During the EP1HS, vantage points along the shore and sea wall were checked for signs of otter presence and/or activity. Areas of rocks and logs above high tide were checked using binoculars for spraints. No evidence (e.g. spraints, holts etc) of otter was recorded during the EP1HS.

It is considered unlikely that otter are present within the proposed scheme footprint due to its isolation from other suitable otter habitat, however there is potential for them to be using the wider area and network of watercourse. Therefore, the proposed scheme may give rise to indirect impacts to foraging/commuting otters and as such, these possible indirect effects on otter are considered further in **Section 11.5** and **Section 11.6**. Otter are considered to be of local value.

Brown hare

Brown hare *Lepus europaeus* may be present within the areas of grassland habitats within the proposed scheme footprint. A significant brown hare population is present within the footprint of the adjacent land-side EIA scheme; however the amount of suitable habitat within the footprint of the proposed scheme is limited in extent and is unlikely to support significant numbers. Nevertheless, the proposed scheme may result in impacts to the local brown hare population and these are considered further in **Section 11.5** and **Section 11.6** .

Brown hare are a Species of Principal Importance and are also listed as a priority species on the Tees Valley Local Biodiversity Species list. Therefore, brown hares are of local value.

Hedgehog

Hedgehog *Erinaceus europaeus* may be present within the proposed scheme footprint and may use the habitat within the proposed scheme footprint for foraging and/or commuting purposes. The proposed scheme may result in impacts to the local hedgehog population and these are considered further in **Section 11.5** and **Section 11.6**.

Hedgehog are a Species of Principal Importance and are also listed as a priority species on the Tees Valley Local Biodiversity Species list. Therefore, hedgehogs are of local value.

Amphibians

The desk study has shown a low number of amphibians within and up to 2km from the proposed scheme footprint. The closest of these records relates to common frog *Rana temporaria*, which is approximately 1.8km south-east at its closest point. There are no records of great crested newt *Triturus cristatus* within or up to 250m of the proposed scheme footprint.

There are no open water features within the footprint of the proposed scheme which could support amphibians. Furthermore, there is a lack of terrestrial habitat available for which amphibians may use to colonise. Consequently, no further surveys and/or mitigation measures are required, and amphibians (including great crested newts) are not considered further in this EcIA.

Reptiles

One record of common lizard *Zootoca vivipara* is approximately 1.6km north-west of the proposed scheme footprint. This location is north of the River Tees, and hence disconnected from the proposed scheme. There is no or limited suitable habitat within the proposed scheme footprint for which reptiles could use for basking, shelter, foraging and/or refuge. Consequently, no further surveys and/or mitigation measures are required, and reptiles are not considered further in this EcIA.

Breeding birds

A breeding bird survey was undertaken for the adjacent land-side development which provides records for a number of species of birds nesting within the footprint of the proposed scheme. Results from this survey effort is shown in Appendix D6 and D7 of the South Industrial Zone Environmental Statement (Lichfields, July 2020). Marine and coastal birds are considered in **Section 12** of this report.

No qualifying species of the Teesmouth and Cleveland Coast SPA and Ramsar sites were recorded breeding within the proposed scheme footprint, either from the desk study data or the land-side breeding bird survey effort. However, **Table 11.11** presents the bird species that were recorded within the proposed scheme footprint during the surveys undertaken to inform the landside EIA.

Table 11.11 Breeding bird species recorded within the footprint of the proposed scheme

BoCC Green Status	BoCC Amber Status
White throat *Sylvia communis*	Stock dove *Columba oenas*
Feral pigeon Columba *livia domestica*	
Wren *Troglodytes troglodytes*	
Wheatear *Oenanthe oenanthe*	
Pied wagtail *Motacilla alba*	
Woodpigeon *Columba palumbus*	
Blue tit *Cyanistes caeruleus*	

Several red listed birds were recorded nearby within the land-side EIA development, including linnet *Linaria cannabina*, lapwing *Vanellus vanellus*, song thrush *Turdus philomelos* and skylark *Alauda arvensis*.

The two metal clad buildings, a brick-built building and the brick-built staithes within the footprint of the proposed scheme have potential to support nesting birds, as does the bramble, scrub and young trees. All buildings except the live substation are to be demolished in advance of the proposed scheme under approvals notices issued by RCBC. The only Schedule 1 bird species they buildings on site could potentially support is Barn Owl but the closest area of suitable habitat that is sufficiently large to support that species are a minimum of 2km away. Barn owl is therefore unlikely to be present due to the lack of connective habitat. The breeding bird assemblage of the proposed scheme footprint is therefore concluded to be of county value.

Invertebrates
The desk study has shown historical records of several notable invertebrates within the last 10 years within and up to 2km of the proposed scheme footprint. These recorded include small heath *Coenonympha pamphilus*, dingy skipper *Erynnis tages* and grayling *Hipparchia semele* butterflies.

Studies undertaken as part of the adjacent landside EIA record habitats of regional significance for dingy skipper and local significance for grayling in areas that overlap with the proposed scheme footprint. The areas of ephemeral/ruderal habitat within the proposed scheme footprint contains birds foot trefoil which is a food plant for dingy skipper young but as the habitat is so small it is unlikely to support significant numbers. The invertebrate assemblage within the footprint of the proposed scheme is of local value and not part of the invertebrate assemblage associated with sand dunes designated under the Teesmouth and Cleveland Coast SSSI.

Invasive non-native species
Japanese rose was recorded within the proposed scheme footprint (**Figure 11.3**), with further stands recorded within the adjacent footprint of the landsite development which was subject to a separate EIA and planning application. Japanese knotweed *Fallopia japonica* was also recorded within the footprint of the proposed scheme (**Figure 11.3**). Invasive non-native species are considered to negatively affect the biodiversity value of the proposed scheme footprint in its baseline condition and are scoped into this assessment as holding local importance.

11.4.4 Summary of terrestrial ecology receptors

Table 11.12 presents a summary of the terrestrial ecology receptors that have or have not been considered further in the EcIA presented in **Section 11.5** and **Section 11.6**.

Table 11.12 Summary of receptors taken forward to the EcIA

Receptor	*Ecological value in relation to the proposed scheme*	*Considered further in this EcIA (yes/no)*
Designated sites	High	No (impacts to European sites are considered in **Section 29** and the zone of influence of the proposed scheme would not extend to the terrestrial ecological interest features of the national sites).
Modified grassland	Low	No
Sparsely vegetated land – ephemeral / ruderal	Low	No
Mixed scrub	Low	No
Broadleaved woodland	Low	Yes
Wharf	Negligible	No
Buildings	Negligible	No
Priority Habitats	Low	No
Notable Flora	Negligible	No
Bats	Local (foraging and commuting)	No (roosting bats) Yes (foraging/commuting bats)
Badger	Negligible	No
Water vole	Negligible	No

Receptor	Ecological value in relation to the proposed scheme	Considered further in this EcIA (yes/no)
Otter	Local	Yes (foraging/commuting)
Brown hare	Local	Yes
Hedgehog	Local	Yes
Amphibians	Negligible	No
Reptiles	Negligible	No
Breeding birds	County	Yes
Invertebrates	Local	Yes
Invasive non-native species	Local	Yes

11.5 Potential impacts during the construction phase

11.5.1 Removal of broadleaved woodland

An area (0.04ha) of the broadleaved woodland will be permanently removed during the construction phase. The trees are not mature (young birch trees), and are present in low numbers, with low ecological value and no indicator species of ancient woodland present. The remainder of the woodland falls within the footprint of the adjacent landside EIA and is fully assessed within the documents supporting that application. Due to the small area (0.04ha) of woodland that will require removal to facilitate the proposed scheme, the magnitude is considered to be low but permanent. As such, a **minor adverse** impact to local woodland resource is anticipated.

Mitigation measures and residual impact
No mitigation measures are required. The residual impact is of **minor adverse** significance.

11.5.2 Disturbance or loss of foraging and commuting habitats for bats

Habitats within the footprint of the proposed scheme provide some, albeit limited, potential foraging/commuting opportunities for bats. This is primarily linked to the food source (invertebrates) for bats which is restricted to the small area of ephemeral/ruderal habitat. The local bat assemblage is of local value, and as European Protected Species (EPS), bats are considered to be of high importance.

Although there are no licencing requirements relating to foraging/commuting bats, potential impacts to foraging and commuting bats could result from night-time working or night-time lighting requirements associated with the construction phase of the proposed scheme. The use of night-time lighting may disrupt foraging and commuting routes which bats may be using to cross the proposed scheme footprint, which in turn has the potential to impair their ability to survive. This would occur if bats must avoid lit areas and thus travel further to reach the same areas for roosting or foraging; or else must forage in poorer quality areas. The coastal habitat within the proposed scheme footprint is of low importance for foraging bats and furthermore existing lighting is already in place within this area associated with ongoing commercial activities adjacent to the proposed scheme footprint. The potential impact to foraging and commuting bats is considered to be negative, temporary and of long duration (across an approximately three-year construction programme). The magnitude of the impact is assessed to be low due to the exposure, limited habitat potential and low activity of bat species. A **moderate adverse** impact is predicted.

Mitigation measures and residual impact

Night-time lighting of construction working areas will be avoided where possible. If night-time working is necessary, then lighting will be designed in accordance with Bats and artificial Lighting in the UK (BCT, ILE, 2018); and Guidance Notes for the Reduction of Obtrusive Light ILE (2011). This is likely to require:

- No direct lighting of the water's edges, or nearby scrub habitats and use of dark buffer zones; and
- Consideration of appropriate luminaire specifications, sensitive light configuration, screening, glazing, dimming and part-night lighting to minimise impacts.

Following the implementation of the mitigation measures, the magnitude of impact will be reduced and the impacts to foraging bats are considered to be **negligible**.

11.5.3 Indirect disturbance (e.g. light, noise, pollution) or injury to commuting otter

Otter are a highly mobile species, with a potential home range of up to 5km in coastal areas. The species is known to occur within the river however no suitable holt or resting site habitat has been recorded within the footprint of the proposed scheme.

The proposed scheme is committed to maintaining a strict footprint of works throughout the construction phase. Specific otter toolbox talks will be provided to all construction staff by a suitably qualified ecologist prior to works commencing, to ensure the protection afforded to otters, the agreed mitigation measures and what to do in the event of encountering an otter is clearly understood by all site personnel. The working methodology will also follow construction industry good practice guidance, as detailed in **Section 11.4.5**, such as having spill kits on site at all times, checking equipment regularly to ensure leakages do not occur, and limiting refuelling of construction plant to designated impermeable areas.

There are no designated nature conservation sites (i.e. SAC) for which otter are a qualifying feature which have direct connectivity with the proposed scheme. Any otters in the vicinity of the proposed scheme are unlikely to be associated with a designated population. As an EPS, otters are considered to be of high importance, but the site is considered to be of low value for the species. Otters are considered to have medium tolerance to disturbance. Disturbance impacts will occur during construction, but these will be temporary only.

There is potential for foraging/commuting otters using the adjacent river channel to be hit by construction vessels or disturbed by underwater noise or dredging activities. The vessels used in construction activities are generally slow moving with noise emitted at a low frequency. This risk of collision is anticipated to be low, as otters will be used to the numerous high levels of shipping traffic within the river, and the low speeds that construction vessels would be travelling at. Otters are considered to be of low sensitivity to underwater noise. Overall, the potential impacts associated with vessels is anticipated to be of **minor adverse** significance.

Potential effects arising from changes in noise are considered in **Section 17**, including embedded mitigation measures to minimise effects from construction phase noise and best practice and policy measures to minimise effects of construction noise. Measures to reduce the impacts of noise and vibration will be included in the CEMP, and with the implementation of such measures, any impacts will be **negligible** in significance, temporary, short term and local and there is not anticipated to be a significant impact to commuting otters.

Negligible impacts on water quality are anticipated during construction of the proposed scheme (**Section 7**). The potential impact of a pollution event to fish (otter prey) has been assessed in **Section 13** as being of no adverse significance following embedded mitigation of development of a Marine Pollution Contingency

Plan and Vessel Management Plan, and implementation of the EAP. Should a pollution event occur, it is likely to be localised, short-term, temporary, and potentially reversible. This impact could have a secondary effect on otter's food resource, however due to the short term/localised nature of any spill event and limited time otters are anticipated to spend in the area, an impact of negligible magnitude is anticipated. Given the unlikeliness of the impact occurring, an impact of **minor significance** is predicted on prey resource.

Section 18 discusses potential impacts from dust and particulate matter from construction activities. With implementation of the mitigation outlined in **Section 18**, there is not anticipated to be a significant impact to otter from air-borne sources during construction.

There is potential for light disturbance of commuting otters, which may create a barrier when attempting to pass the proposed scheme footprint. These impacts are considered to be low in magnitude, constituting an impact of **moderate adverse** significance.

Mitigation measures and residual impact

The following mitigation is proposed to minimise disturbance of otters from construction activities:

- Screening will be used (where possible and feasible to do so) against the river edge to reduce the visual and noise impacts from construction works on foraging/commuting otters.
- Where artificial light is required, lights will be directed away from the river to allow otters to migrate through the area undisturbed. Any lighting required at these areas will be of low intensity.

The following mitigation will be implemented to prevent injury or death to otter should any animal roam in the vicinity of the proposed scheme during construction:

- All otter mitigation measures for the site will be agreed with Natural England prior to construction;
- Given otters are very mobile species, a pre-construction survey eight weeks (to allow time for a Natural England disturbance licence application, if required) before construction commences will be undertaken, to re-assess otter activity. Prior to the commencement of operations an otter survey will be undertaken, within the proposed footprint of construction plus a 250m buffer zone, to determine current use at the time of construction (otters may increase their use of the site in the interim period between the current survey and the commencement of construction). The surveys will be undertaken in appropriate weather condition and following guidance in the 'New Rivers and Wildlife Handbook' (Holmes et al, 1994), Chanin (2003) and Strachan & Jefferies (1996).
- Should an active resting site be found, an EPS Licence is likely to be required to undertake work within this area. Consultation will be required with Natural England to discuss the mitigation measures required, which will subsequently form the basis of the otter licence. This is likely to include the following:
    - Construction vehicles and equipment should not be active on, or stored by the riverbank for longer than is essential;
    - The risks can be further reduced by following best practice and guidance produced by Design Manual for Roads and Bridges (DMRB Volume 10 section 4);
    - An Ecological Clerk of Works (ECoW) will be present during the works. Work should stop should an otter holt or resting place be found within 250m, and Natural England consulted, as a licence may be necessary before works can continue;
    - A temporary ramp will be placed in trenches over 0.5 m deep in order to allow a potentially trapped animal to exit the trench;
    - Any open pipes will be capped to prevent animals gaining access; and
    - All excavations and pipe systems will be checked at the start of each working day.

Following the implementation of the mitigation measures outlined above, the potential effects to otter are assessed to be of **negligible** significance.

11.5.4 Disturbance / harm to breeding birds or destruction of nests

The proposed scheme requires the demolition of the dilapidated wharf, jetties, an electrical substation and clearance of areas of bramble scrub and young trees. These features have potential to support nesting birds and a number of ground nesting bird species have also been recorded utilising the terrestrial habitats within the footprint of the proposed scheme, including an amber list species.

Breeding birds are considered to be of county value in the footprint of the proposed scheme and are of medium importance. Permanent habitat loss will occur within the footprint of the proposed scheme, although this is considered to be small in extent and is relatively localised. Birds will have some ability to tolerate this change by transiting to more preferable areas to breed in future years. The loss of this area will not cause habitat fragmentation. The magnitude of impact is anticipated to be low. Overall an impact of **minor adverse significance** is anticipated on breeding birds.

Mitigation measures and residual impact

The removal of trees, scrub, buildings, structures or other habitat with the potential to support breeding bird nests will be undertaken outside the breeding bird season where possible (which is typically March to August inclusive) to remove the risk of damage or destruction of active nests. Should this not be possible, a nesting bird survey will be undertaken by a suitably experienced ecologist immediately prior to works commencing.

With the implementation of the above measures, the residual impact is of **negligible** significance.

11.5.5 Loss of foraging and breeding resource for invertebrates

Limited habitat occurs within the footprint of the proposed scheme for invertebrate assemblage, notably dingy skipper and grayling. There is likely to be a loss of foraging and breeding habitat for these species, but the area of suitable habitat is small in extent and on the periphery of suitable habitat for these species and unlikely to support significant numbers of invertebrates. The invertebrate assemblage is considered to be of local (grayling) and (dingy skipper) significance, and negligible importance within the footprint of the proposed scheme, with the potential to adapt to more suitable areas and is therefore assessed as being of medium sensitivity. The impact is considered to be of medium magnitude with localised habitat loss in the long term (permanently). Overall, the impact significance of loss of habitat and breeding resource is assessed to be **minor adverse**.

Mitigation measures and residual impact

No mitigation measures are required. The residual impact is of **minor adverse** significance.

11.5.6 Disturbance and habitat loss of brown hare / hedgehog

The footprint of the proposed scheme provides a small extent of habitat potential for hedgehog and brown hare. The construction phase is likely to cause permanent habitat loss for these species and has potential to result in temporary disturbance/ injury or death to these species. Both are considered to be of local value. Due to the limited extent of habitat potential, the magnitude of impact is assessed to be low. Any potential impact is considered to be **minor adverse** in significance.

Mitigation measures and residual impact

As additional mitigation for hedgehog, any individuals found within the works area will be moved to a safe and sheltered location. This process will be described in a CEMP and reviewed by a suitably qualified

ecologist. Assistance will be sought from a suitably qualified ecologist for any injured hedgehog found during the works.

As a precaution, deep trenches and excavations dug across the proposed scheme footprint will be covered overnight or be left with a plank or similar material with a slope no more than 45°, in order to allow hedgehog and small mammals to exit trenches or excavations if they fall in. This will also be detailed in the CEMP.

The residual impact to brown hare and hedgehog is **minor adverse**.

11.6 Potential impacts during the operational phase

The proposed scheme will result in the complete loss of habitat, with permeant effects. The land parcels will become an operational quay. As such, there will be no habitat potential during the operation phase and therefore **no impact** for the following ecological receptors:

- INNS;
- Invertebrates;
- Brown hare; and
- Hedgehog.

11.6.1 Light pollution impacts on foraging/commuting otters and bats

There is potential for commuting otters and bats to be disturbed by light pollution during the operational phase, however there will be no habitat potential for either species within the footprint of the proposed scheme itself. There is limited habitat potential for bats and otters within the proposed scheme footprint and the impact magnitude is anticipated to be low, albeit permanent. As such potential disturbance impacts are anticipated to be of **minor - moderate adverse** significance.

Mitigation measures and residual impact

Operational lighting will be designed in accordance with Bats and artificial Lighting in the UK (BCT, ILE, 2018); and Guidance Notes for the Reduction of Obtrusive Light ILE (2011). Light spill will be minimised where possible and a lighting strategy will be developed and reviewed by a suitably qualified ecologist.

Following the implementation of mitigation, the impact to commuting bats and otters is anticipated to be of **minor adverse** significance.