

Phase 1 Habitat Survey
**Intertidal Habitat, Tilbury2 Port
Terminal, Tilbury**

For

Port of Tilbury London Limited

Project No.: AUNI123/002/001/003

October 2017

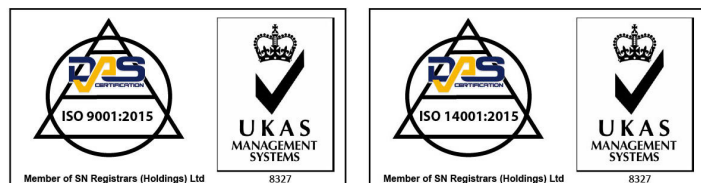
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Contents

1. Summary	5
2. Introduction	6
2.1 Development Background	6
2.2 The Brief	6
2.3 Surveyors.....	7
3. Methodology	8
4. Results.....	9
4.1 Background	9
4.2 Field Survey.....	9
5. Legislation and Planning Policy Considerations.....	16
5.1 Background	16
5.2 Priority Habitats	16
5.3 Protected Species	16
5.4 Other Species of Conservation Concern	17
6. Conclusion.....	18
7. References	19

Figure 1. Site Location.

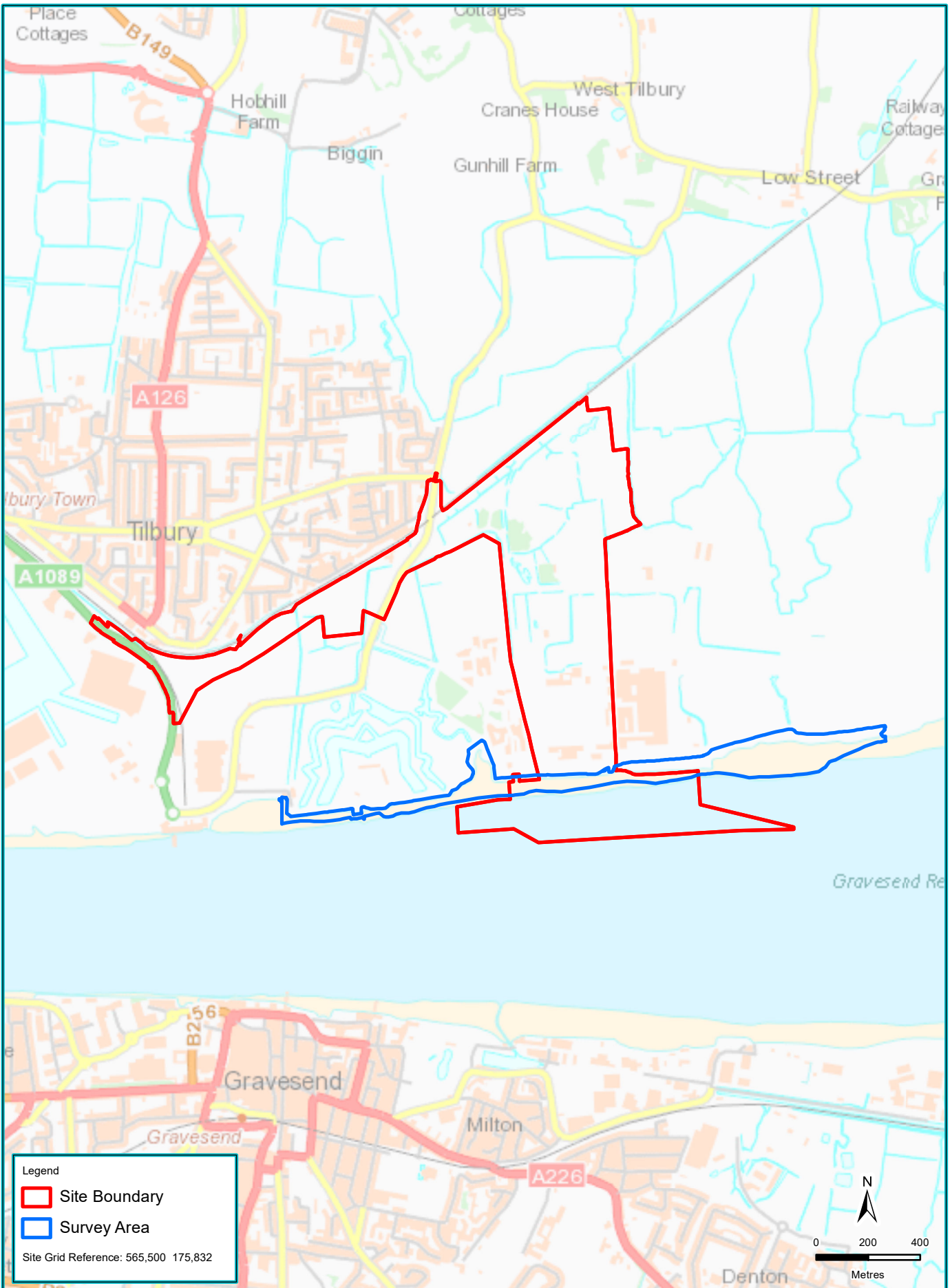
Figure 2. Extended Phase 1 Habitat Survey Results.

Figure 3. Photographs of the Site.

1. Summary

- 1.1.1** The Port of Tilbury London Limited (PoTLL) is proposing to build a new port terminal at Tilbury, on land previously occupied by the Tilbury Power Station. The project is known as Tilbury2, and includes the redevelopment of the existing marine terminal. This will require improvement of and extensions to the existing power station jetty, removal of the Anglian Water jetty, and dredging works around the jetty and along the approach channel. The proposals are hereafter referred to as 'the development'. The area directly affected by the development is hereafter referred to as 'the site'. The site location is shown on Figure 1.
- 1.1.2** Thomson Ecology Ltd was commissioned to undertake a Phase 1 Habitat Survey of intertidal habitats within the site and in a buffer area around the proposed development extending 700m upstream and 1.5km downstream of the site along the left bank of the River Thames. The area within which the survey was undertaken is hereafter referred to as 'the survey area', and is shown on Figure 1.
- 1.1.3** A map of the habitats identified during the extended Phase 1 survey is provided on Figures 2a to 2d, and photographs of the survey area are shown on Figure 3. The main findings of the survey are that:
- The survey area supports the following Phase 1 habitats: dense scrub; scattered scrub; tall ruderal; brackish running water; intertidal mud/sand; intertidal shingle/cobbles; intertidal boulders/rocks; intertidal boulders/rocks with brown algal beds; dense/continuous saltmarsh; boulders/rocks above high tide mark; soft maritime cliff/slope; sea wall; buildings; bare ground; hard standing; mosaic of intertidal mud/sand and sea wall; mosaic of intertidal mud/sand and intertidal boulders/rocks; mosaic of dense/continuous saltmarsh and poor semi-improved mosaic of poor semi-improved grassland and tall ruderal; and mosaic of bare ground and ephemeral/short perennial;
 - Two of these habitats (dense saltmarsh and intertidal mud/sand) are Habitats of Principal Importance under Section 41 of the Natural Environment and Rural Communities Act 2006;
 - Three plant species of conservation concern (golden-samphire, annual beard-grass and dittander) were recorded during the survey.
- 1.1.4** The survey area supports habitats that may potentially be used by a number of protected species and species of conservation concern, comprising marine mammals, bats, birds, reptiles, and invertebrates.
- 1.1.5** The development has the potential to have a negative impact on two types of priority habitat and three plant species of conservation concern that were recorded within the survey area. In addition the development has the potential to have a negative impact on a number of protected species and species of conservation concern that may occur within the survey area. Further survey would be required to determine the presence or likely absence of these species.

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



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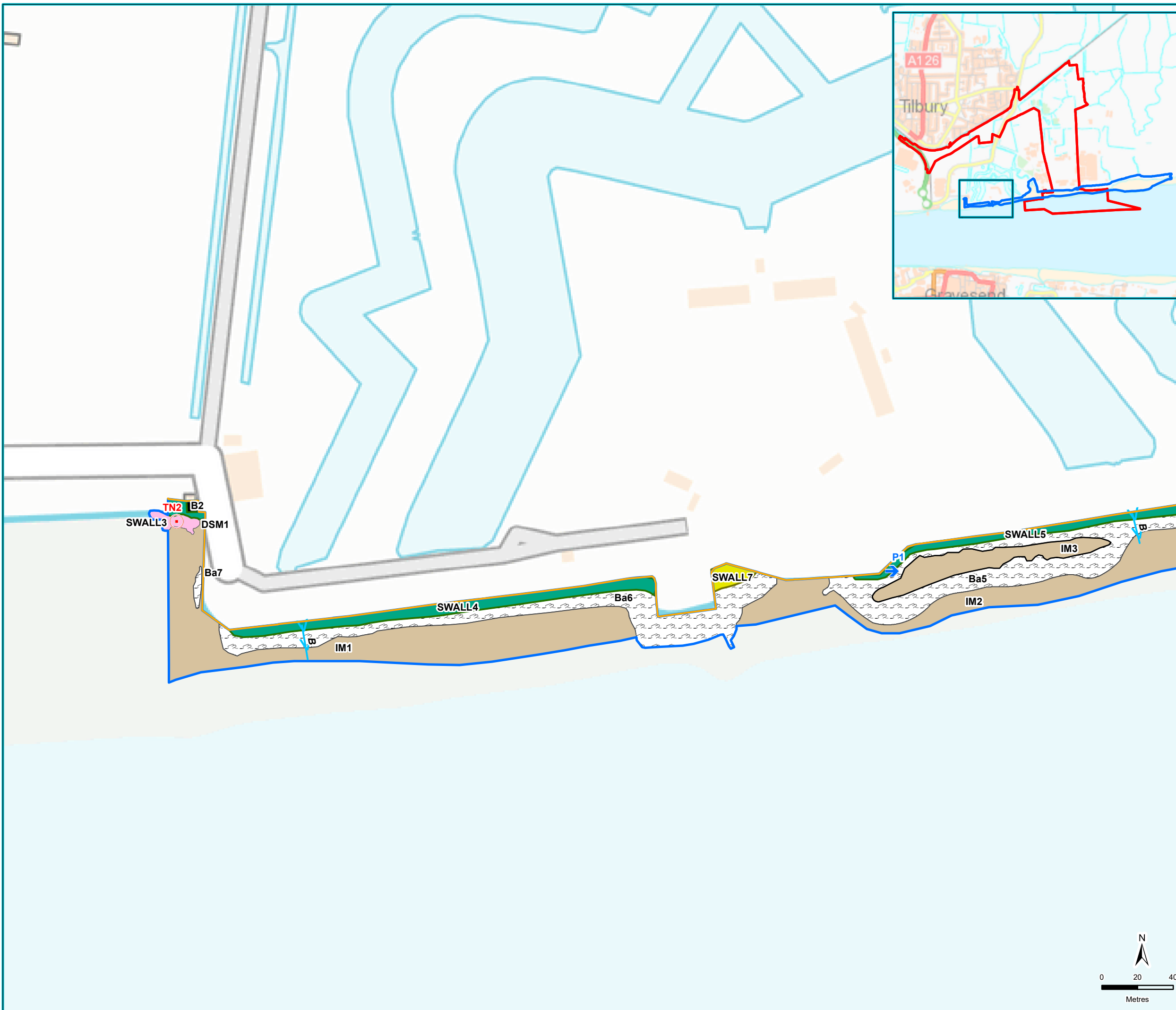
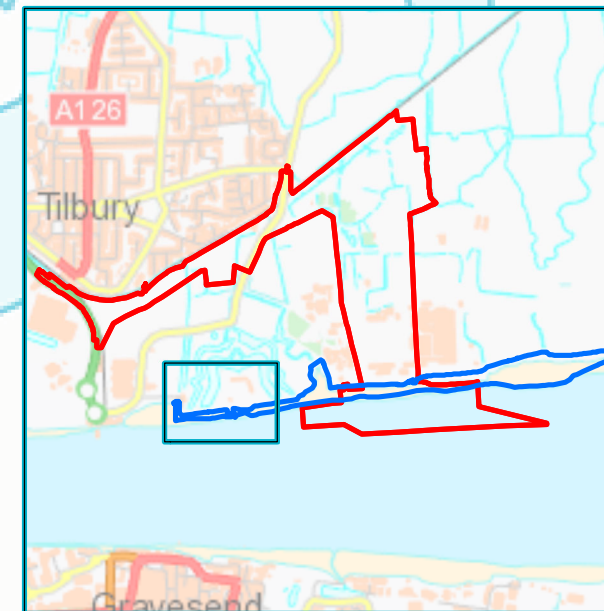
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Legend

-  Photograph Location and
-  Target Note
-  Vertical Sea Wall
-  Running Water (B)
-  Rock Armour / Intertidal Mud and Sand (SWALL/IM)
-  Rock Armour
-  Building (B)
-  Dense Saltmarsh (DSM)
-  Brown Algal Beds
-  Intertidal Mud and Sand (IM)
-  Survey Area
-  Site Boundary



Site Grid Reference: 565,000 175,256

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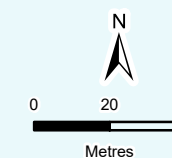
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



Figure Number
2a

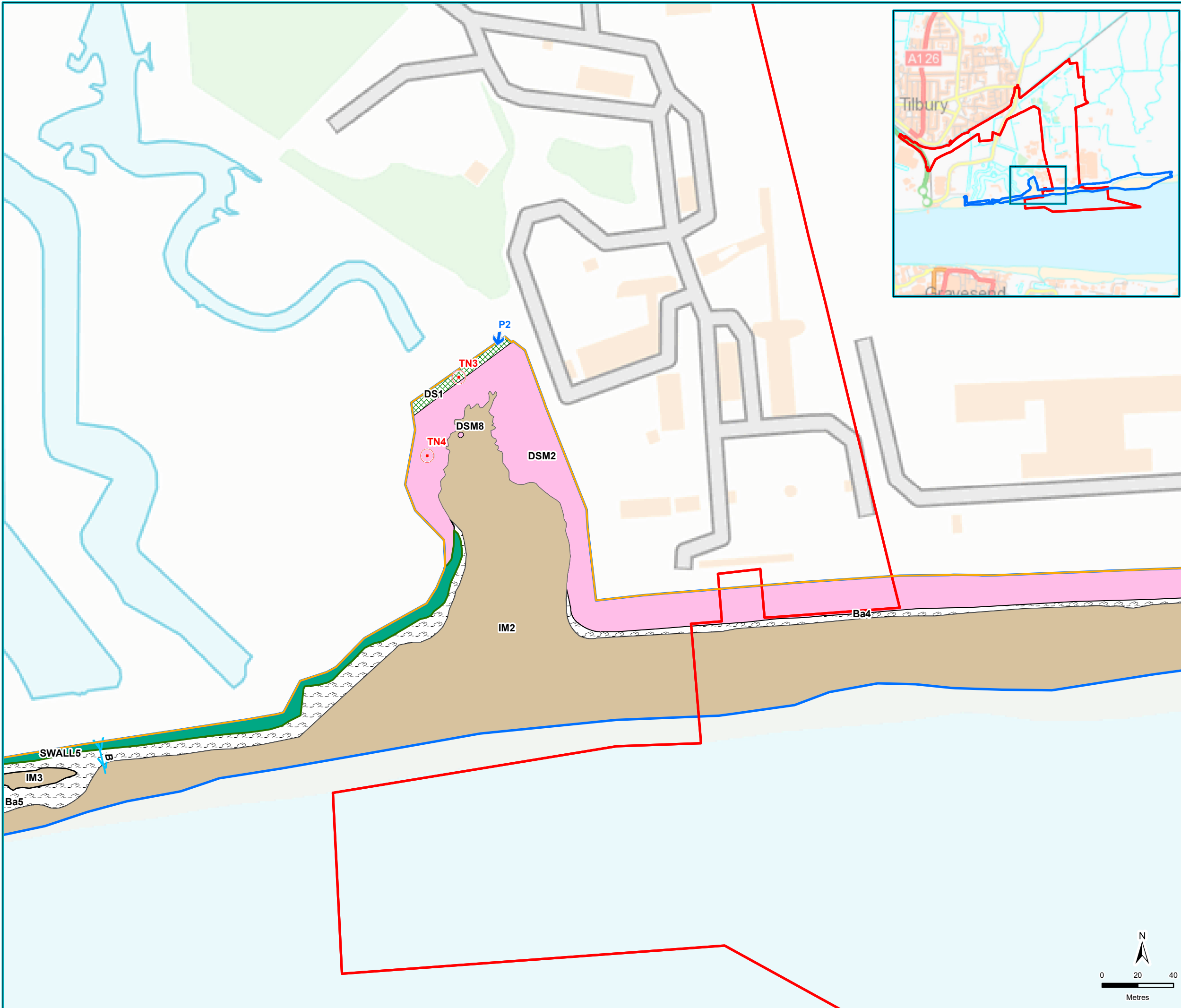
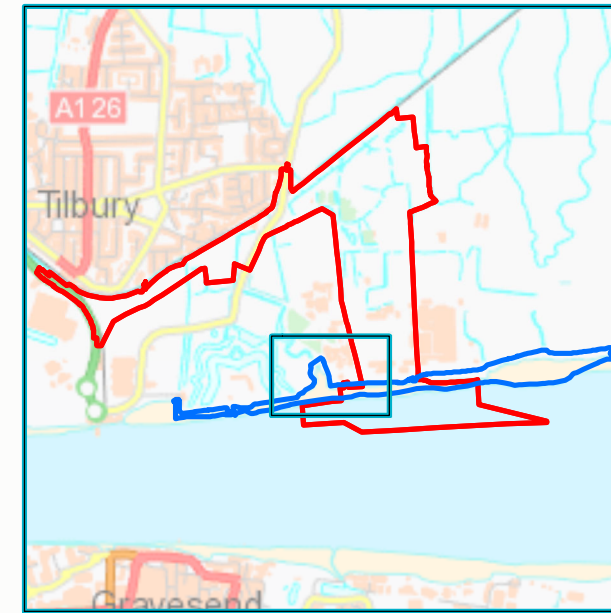
Figure Title
**Extended Phase 1
Habitat Survey Results**



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Legend

-  Photograph Location and
-  Target Note
-  Vertical Sea Wall
-  Running Water (B)
-  Rock Armour
-  Dense Saltmarsh (DSM)
-  Brown Algal Beds
-  Intertidal Mud and Sand (IM)
-  Dense Scrub (DS)
-  Survey Area
-  Site Boundary



Site Grid Reference: 565,579 175,386

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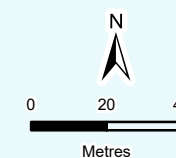
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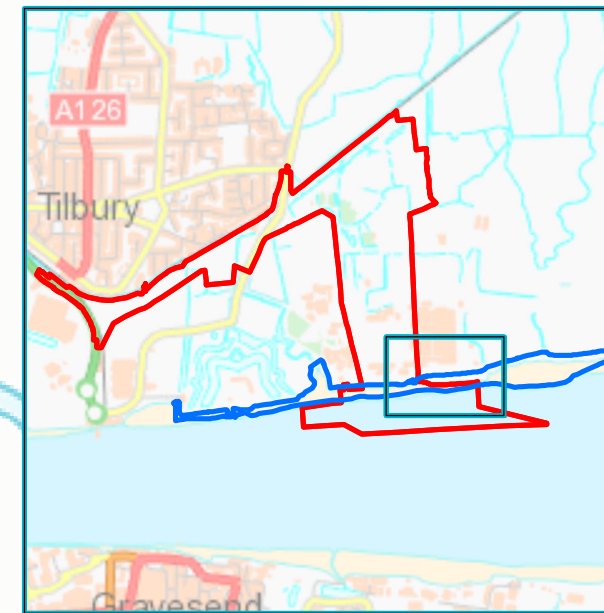
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Figure Number
2b

Figure Title
**Extended Phase 1
Habitat Survey Results**



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Legend

- Photograph Location and Direction
- Scattered Scrub
- Target Note
- Vertical Sea Wall
- Not Surveyed (NS)
- Mud / Boulders and Rocks (IM/IR)
- Rock Armour (SWALL)
- Building (B)
- Hard Standing
- Dense Saltmarsh (DSM)
- Brown Algal Beds (Ba)
- Intertidal Mud and Sand (IM)
- Tall Ruderal (TR)
- Poor Semi-improved Grassland (SI)
- Scattered Scrub (SS)
- Survey Area
- Site Boundary

Site Grid Reference: 566,186 175,395

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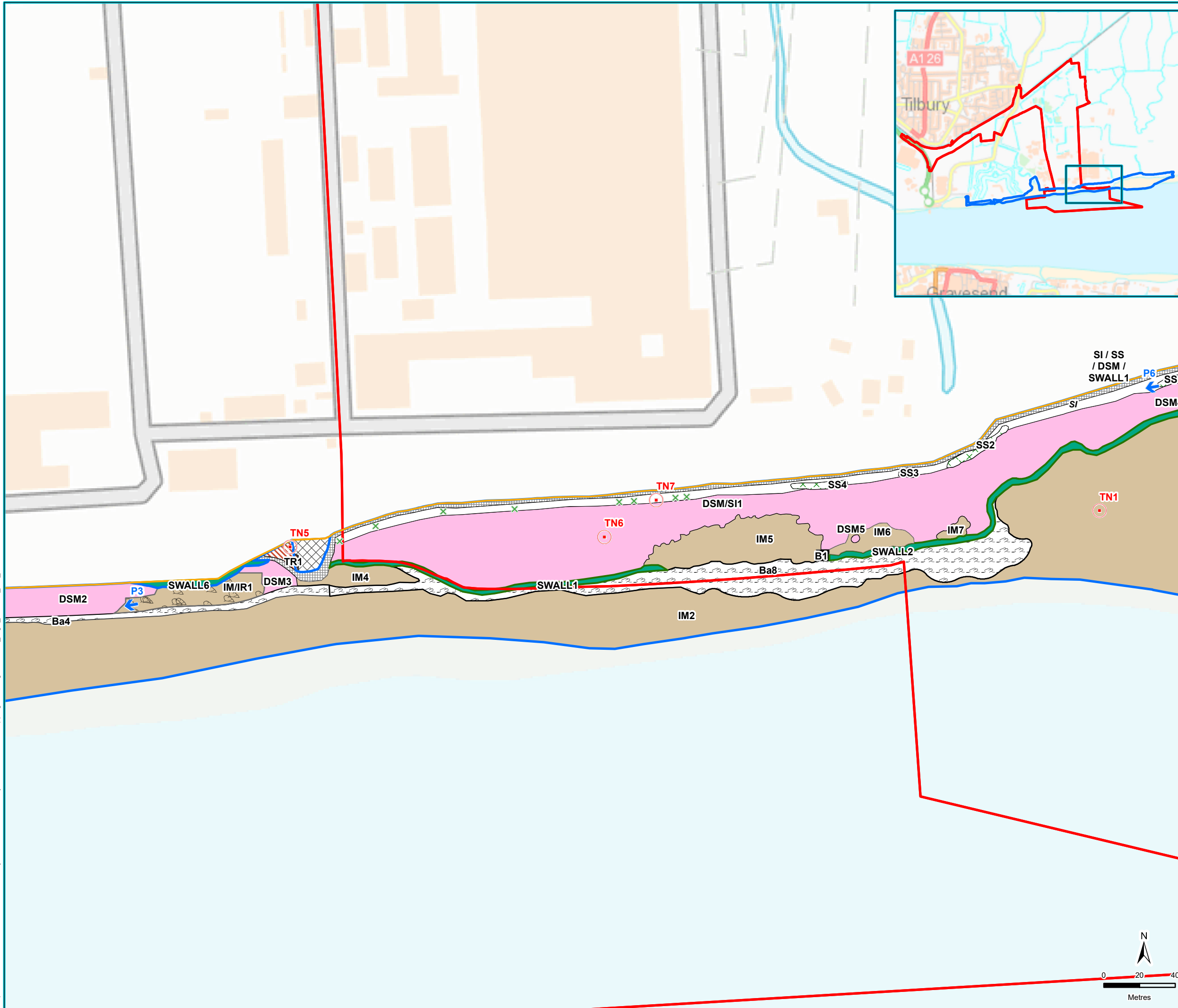
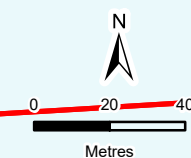
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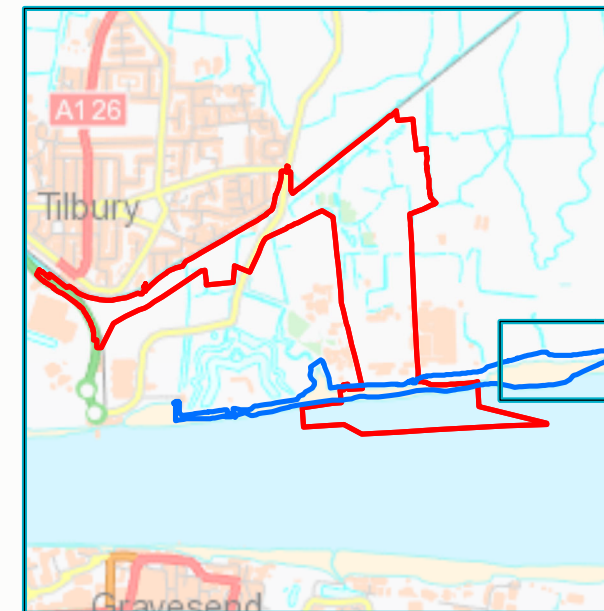
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Figure Number
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Figure Title
**Extended Phase 1
Habitat Survey Results**



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- Legend
- Photograph Location and
 - Scattered Scrub
 - Target Note
 - Soft Cliff
 - Sheet Piling
 - Vertical Sea Wall
 - Rock Armour
 - Bare Ground (BG)
 - Hard Standing
 - Boulders/ Rock Above High Tide Mark (BR)
 - Intertidal Shingle / Cobbles (ISC)
 - Dense Saltmarsh (DSM)
 - Brown Algal Beds
 - Intertidal Mud and Sand (IM)
 - Poor Semi-improved Grassland (SI)
 - Scattered Scrub (SS)
 - Survey Area
 - Site Boundary

Site Grid Reference: 566,798 175,475

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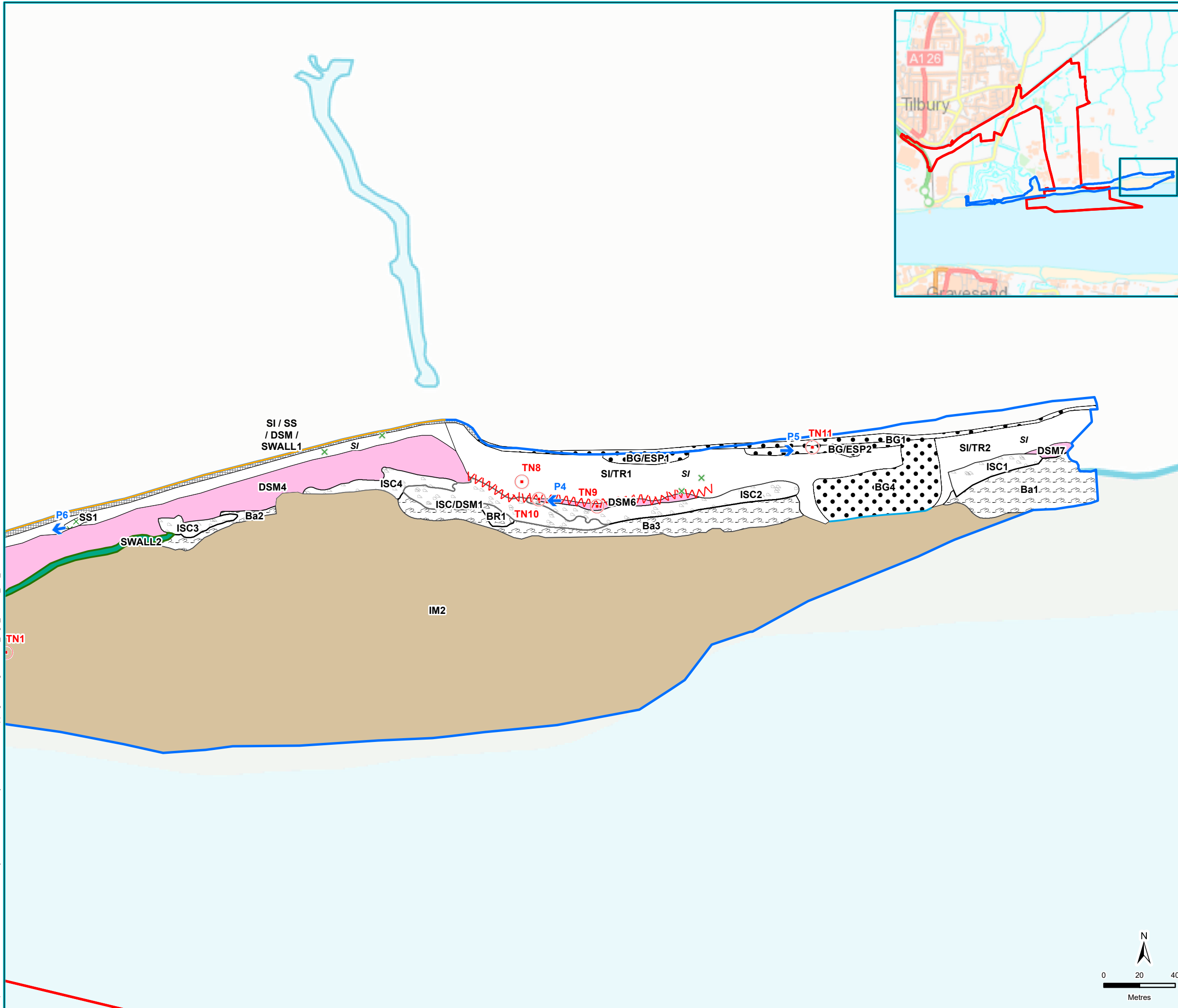
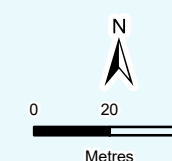
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2d

Figure Title
**Extended Phase 1
Habitat Survey Results**





Photograph 1:
From left to right: sea wall (wall and rock armour), brown algal beds on intertidal boulders/rocks, and intertidal mudflats.



Photograph 2:
From right to left: Sea wall, dense scrub, dense/continuous saltmarsh, and intertidal mudflats.



Photograph 3:
From right to left: Sea wall, dense/continuous saltmarsh (with sea couch facies, sea-purslane and sea plantain facies, and common cord-grass facies), sea wall (rock armour), brown algal beds on intertidal boulders/rocks, and intertidal mudflats.



Photograph 4:
Soft maritime cliff with mosaic of poor semi-improved grassland and tall ruderal at the top of the cliff and dense/continuous saltmarsh (sea couch and sea beet facies) at the bottom.



Photograph 5:
Mosaic of bare ground and ephemeral/short perennial vegetation.



Photograph 6:
Mosaic of scattered scrub, poor semi-improved grassland, saltmarsh and sea wall (rock armour).

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2. Introduction

2.1 Development Background

2.1.1 The Port of Tilbury London Limited (PoTLL) is proposing a new port terminal on the north bank of the River Thames at Tilbury, a short distance to the east of its existing Port. The proposed port terminal will be mainly constructed on previously developed land that formed the western part of the now redundant Tilbury Power Station. The project is known as “Tilbury2.” The proposed main uses on the site will be a Roll-on/Roll-off (Ro-Ro) terminal and a Construction Materials and Aggregates Terminal (the “CMAT”), and associated infrastructure.

2.1.2 The proposed volumes of import/export of Ro-Ro units for the terminal exceed the threshold of 250,000 units stated in the Planning Act 2008 for throughput per annum. The Tilbury2 project therefore constitutes a Nationally Significant Infrastructure Project (NSIP) and will require a Development Consent Order (DCO). The DCO application for Tilbury2 will be supported by an Environmental Statement and Water Framework Directive compliance assessment.

2.1.3 As part of these proposals, a range of works will be required on the coastal and marine side of the proposed port terminal, on the seaward side of the existing flood wall. These will include:

- Improvement of and extensions to the existing jetty including creation of a new Ro-Ro berth;
- Dredging of berth pockets around the existing and extended jetty;
- Dredging of the approach channel, and
- Removal of the Anglian Water jetty.

2.1.4 The proposals for the coastal and marine side of the Tilbury2 project described above are hereafter referred to collectively as ‘the development’. The area directly affected by the development is hereafter referred to as ‘the site’. The site location is shown on Figure 1,

2.1.5 It has been recognised that, due to the extension of the jetty, removal of the Anglian Water jetty and dredging, the development may cause changes in coastal sediment erosion and accretion patterns and therefore have an impact on intertidal habitats beyond the site boundary. Hydrodynamic modelling of the spatial extent of potential impacts from the development is being undertaken but it is not yet complete. The spatial extent of impacts from the project on intertidal habitats is thus currently unknown. Consequently, a precautionary approach has been taken and a buffer extending 700m upstream and 1.5km downstream of the site along the left bank of the River Thames has been included when defining the area of intertidal habitat that could potentially be impacted by the development.

2.2 The Brief

2.2.1 Thomson Ecology Ltd was commissioned on 9th May to undertake the following:

- An extended Phase 1 habitat survey of the intertidal area around the existing jetty and proposed jetty extension on the north bank of the River Thames at the former Tilbury Power Station site. Habitats and species observed in the survey area were to be recorded and mapped and the potential for habitats to support protected species was to be assessed.

- A technical report for the extended Phase 1 habitat survey to include an introduction, methodology, results and a brief discussion of relevant legal and planning policy issues; and
- Appropriate digitised mapping.

2.3 Surveyors

- 2.3.1 The extended Phase 1 habitat survey was carried out by Arnaud Duranel MSc PhD MCIEEM and Angela Polak BSc MSc Grad CIEEM .

3. Methodology

- 3.1.1** A survey area was defined that encompassed all intertidal habitats from the Mean Low Water Springs isobath to the flood defence wall within the area potentially impacted by the development, including a buffer zone extending 700m upstream and 1.5km downstream of the site boundaries along the left bank of the River Thames. The survey area is shown on Figures 1 and 2a to 2d.
- 3.1.2** A Phase 1 habitat survey (JNCC, 2010) was conducted throughout the survey area. Phase 1 habitat survey is a standard technique for rapidly obtaining baseline ecological information over a large area of land. It is primarily a mapping technique and uses a standard set of habitat definitions for classifying areas of land on the basis of the vegetation present. For this survey, the technique was modified (or extended) to provide more detail over a smaller area and give further consideration to fauna (Institute of Environmental Assessment, 1995). The standard habitat definitions were used with an additional category of coarse grassland for unmanaged, secondary grasslands that are species poor.
- 3.1.3** The dominant and readily identified species of higher plant species from each habitat type within the survey area were recorded and their abundance was assessed on the DAFOR scale:
- D Dominant
 - A Abundant
 - F Frequent
 - O Occasional
 - R Rare
- 3.1.4** These scores represent the abundance within the defined area only and do not reflect national or regional abundances. Plant species nomenclature follows Stace (2010).
- 3.1.5** Target notes were made for any features which were too small to map or are of particular ecological interest; or to show particular areas within habitat parcels where vegetation was surveyed more exhaustively, hereafter referred to as 'vegetation survey plots'.
- 3.1.6** Incidental records of fauna were also made during the survey and the habitats identified were evaluated for their potential to support protected species and other species of conservation concern, including Priority Species. However, no specific faunal surveys were undertaken.
- 3.1.7** The survey was conducted on the 1st of June 2017.

4. Results

4.1 Background

4.1.1 The contents of the results section are the factual results of the desk study and extended Phase 1 habitat survey. Excluded from this section is the assessment of the site to support species of conservation concern not recorded during the survey.

4.2 Field Survey

4.2.1 The following Phase 1 habitat types were identified:

- Dense scrub;
- Scattered scrub;
- Tall ruderal;
- Brackish running water;
- Intertidal mud/sand;
- Intertidal shingle/cobbles;
- Intertidal boulders/rocks;
- Intertidal boulders/rocks with brown algal beds;
- Dense/continuous saltmarsh;
- Boulders/rocks above high tide mark;
- Soft maritime cliff/slope;
- Sea wall;
- Buildings;
- Bare ground;
- Hard standing;
- Mosaic of intertidal mud/sand and sea wall;
- Mosaic of intertidal mud/sand and intertidal boulders/rocks;
- Mosaic of dense/continuous saltmarsh and poor semi-improved grassland;
- Mosaic of poor semi-improved grassland, scattered scrub, dense/continuous saltmarsh and sea wall;
- Mosaic of intertidal shingle/cobbles and dense/continuous saltmarsh;
- Mosaic of poor semi-improved grassland and tall ruderal; and
- Mosaic of bare ground and ephemeral/short perennial.

4.2.2 These habitats are described below and their distribution is given on Figures 2a to 2d. Their distribution is shaped by the presence along most of the survey area of a coastal defence system

built on the north bank of the river Thames. This system comprises a continuous vertical concrete wall inland and a discontinuous rock armour of varying width and slope at the toe of the vertical wall.

4.2.3 Photographs of the main habitats identified within the survey area are shown on Figure 3.

4.2.4 A full list of species recorded in each habitat is given in Appendix 1.

Dense scrub (DS)

4.2.5 A small area of dense scrub (DS1 on , Photograph 2 on Figure 3) occurs at the bottom of the sea wall immediately west of the sewage works. It covers 388m². Bramble (*Rubus fruticosus* agg.) dominates the shrub layer, with frequent hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*) and dog-rose (*Rosa canina* agg.) and rare elder (*Sambucus nigra*).

Scattered scrub (SS)

4.2.6 Scattered scrub occurs within the poor semi-improved coarse grassland along the footpath east of the power station pontoon. It covers a combined area of approximately 369m² and comprises scattered hawthorn and blackthorn, one isolated pear tree (*Pyrus communis*) and patches of dog-rose and bramble (SS1 to SS4 on Figure 2).

Tall ruderal (TR)

4.2.7 A small patch of tall ruderal vegetation (TR1 on Figure 2) is found on the bank supporting the main pontoon south of the power station. It covers 147m². False oat-grass (*Arrhenatherum elatius*), creeping thistle (*Cirsium arvense*), common nettle (*Urtica dioica*) and bramble are abundant to frequent, with occasional hedge bindweed (*Calystegia sepium*) and cleavers (*Galium aparine*) and rare hedge bedstraw (*Galium album*).

Brackish running water

4.2.8 This comprises the outlet of the two culverts allowing sea water to flow in and out of the moats around Tilbury Fort, at least one of them is assumed to be filled with brackish water. The outlet is entirely concreted. No vegetation was recorded.

Intertidal mud/sand (IM)

4.2.9 Intertidal mud forms a continuous habitat all along the survey area in the lower part of the intertidal range (IM1 and IM2 on Figure 2, Photograph 3 on Figure 3). No vegetation was present. In the absence of detailed bathymetric data that could be used to delineate the Mean Low Water Springs isobath, the seaward boundary of intertidal mudflats was estimated using aerial photography. Smaller secondary mudflats have formed at a slightly higher level in flat areas within the rock armour at the toe of the sea wall (IM3 to IM7 on Figure 2, Photograph 1 on Figure 3). The total area covered by intertidal mudflats within the survey area was estimated to be around 10.8ha.

Intertidal shingle/cobbles (ISC)

- 4.2.10** In the eastern part of the survey area, there are small patches of intertidal shingle (ISC1 to ISC4 on Figure 2) covering a combined area of 0.2ha. These are of artificial origin, resulting from the dumping of crushed construction material including bricks and concrete that were reworked by the sea. No vegetation is present.
- 4.2.11** ISC/DSM1 is a mosaic of intertidal shingle and eroding dense saltmarsh further east, covering 0.1ha. The vegetation occurring on the saltmarsh patches is similar to that on dense/continuous saltmarsh described below.

Intertidal boulders/rocks with brown algal beds (Ba)

- 4.2.12** This habitat (Ba1 to Ba8 on Figure 2, Photographs 1 and 3 on Figure 3), which covers a combined area of 1.9ha, corresponds to the lowest lying part of the rock armour that was built at the toe of the sea wall or in front of saltmarshes. The width of this rock armour that is within the intertidal range has been colonised by brown algae, mainly bladder wrack (*Fucus vesiculosus*). This width is very variable along the survey area, ranging from 0 to 45m.

Dense/continuous saltmarsh (DSM)

- 4.2.13** Dense saltmarsh habitats cover 2.9ha and are found almost continuously from the creek west of the sewage works to the end of RWE land south of the ash field. Characteristic species include abundant to dominant sea-purslane (*Atriplex portulacoides*), with abundant sea couch (*Elytrigia atherica*), sea plantain (*Plantago maritima*), sea arrowgrass (*Triglochin maritima*), frequent sea aster (*Aster tripolium*) and cord-grass (*Spartina* sp.), occasional greater sea-spurrey (*Spergularia media*), and a number of additional species described in each habitat parcel account below. Even though the Phase 1 survey methodology recognises one dense saltmarsh habitat only, the vegetation was clearly distributed along a topographic gradient (see Photograph 3 on), with a sea couch facies occupying the upper saltmarsh and a sea-purslane and sea plantain occupying the mid saltmarsh. Where no rock armour was present, for instance within the creek west of the sewage works, patches of cord-grass occupied the lower saltmarsh, ensuring a transition with mudflats. Elsewhere, the rock armour forms a sharp transition between mudflats and saltmarsh habitats, which have lost their natural dendritic pattern.
- 4.2.14** DSM1 is a small (187m²) patch of dense saltmarsh at the west end of the survey area. Sea aster and cord-grass are abundant, sea-purslane occasional, and English scurvygrass and sea plantain frequent.
- 4.2.15** Further east, DSM2 and DSM3 covers 1.2ha between the creek west of the sewage works and the main pontoon of the power station (Photographs 2 and 3 on). Sea-purslane is dominant, sea couch abundant, sea aster, sea plantain and sea arrowgrass frequent, saltmarsh rush (*Juncus gerardii*), common saltmarsh-grass (*Puccinellia maritima*), cord-grass and greater sea-spurrey occasional, and English scurvygrass, sea-milkwort (*Glaux maritima*), dittander (*Lepidium latifolium*) and common sea-lavender (*Limonium vulgare*) are rare. DSM8 is a small patch of cord-grass that has started to colonise the mudflat.
- 4.2.16** DSM4 and DSM5 covers 1.6ha between the pontoon and the area south of the ash field. Sea-purslane, sea plantain and sea arrowgrass are dominant, with frequent sea aster, sea couch, red

fescue (*Festuca rubra*) and cord-grass. Sea milkwort, common sea-lavender and greater sea-spurrey are occasional, and common reed (*Phragmites australis*), common saltmarsh-grass and golden-samphire (*Inula crithmoides*) are rare.

- 4.2.17** At the foot of the soft cliff in the eastern part of the site, there is a narrow strip of species-poor vegetation (DSM6 on Figure 2, Photograph 4 on Figure 3) related to saltmarsh communities, and dominated by sea beet (*Beta vulgaris* subsp. *maritima*) and sea couch.
- 4.2.18** Finally, DSM7 is a small patch of relic saltmarsh vegetation within disturbed ground in the eastern end of the site.

Boulders/rocks above high tide mark (BR)

- 4.2.19** In the eastern part of the survey area, there is a small (138m²) area of concrete blocks and large rocks, part of which is located above Mean High Water Springs.

Soft maritime cliff/slope

- 4.2.20** The eastern part of the survey area is being actively eroded by the sea, and a small vertical soft cliff, about 1.0 to 1.5 metre high, has formed in clayey and chalky deposits over a length of approximately 145m (Photograph 4 on). It forms a boundary between intertidal shingles (IS2) and eroding saltmarsh with intertidal shingles (IS/DSM1) and the vegetation growing on the upper terrace out of reach of sea water. Material falling from the cliff has been colonised by a strip of saltmarsh vegetation (DSM6, see above).

Sea wall (SWALL)

- 4.2.21** A flood defence structure is present continuously along most of the northern boundary of the survey area, over a distance of 2.3km from the World's End Pub to the east of the ash field. It is made of several components (Photographs 1 and 3 on):
- A vertical wall, 2-3m in height;
 - A rock armour with a shallow slope at the toe of the vertical wall, in which gaps between boulders have been filled with asphalt or concrete;
 - A rock armour with free boulders or rocks further into the sea, directly in front of the other sea defences south of Tilbury Fort or defending saltmarshes south of the power station and the ash field.
- 4.2.22** The upper part of the rock armour, where devoid of vegetation, was mapped as such (SWALL1 to SWALL5). It covers 0.5ha in total.
- 4.2.23** The lower part of the rock armour, located within the normal intertidal range, has been colonised by brown algal beds, and was mapped as such (Ba1 to Ba8), see above.
- 4.2.24** At the eastern end of the survey area, there is a barge loading area that is defended by a small length (about 60m) of iron sheet piling.

Buildings (B)

- 4.2.25** There are two small buildings within the survey area. The first one (B1) is a blockhaus located east of the power station main jetty. Its footprint is approximately 44m². The second one is the Environment Agency's pumping station at the western end of the survey area, with a footprint of 42m².
- 4.2.26** The three jetties and pontoons south of the power station have not been mapped as they are built on piles with a minimal footprint and habitats underneath them have been maintained. These habitats have been mapped instead.

Bare ground (BG)

- 4.2.27** Bare ground is present in the eastern part of the survey area, on the recently relocated footpath (BG1) and on the barge loading area (BG4). It covers a combined area of approximately 0.3ha.

Hard standing

- 4.2.28** Within the survey area, hard standing is found only on the tarmacked footpath along the power station.

Mosaic of intertidal mud/sand and sea wall (SWALL/IM)

- 4.2.29** To the south of Tilbury Fort there is a small area covering 235m² where intertidal mud has deposited over the rock armour at the toe of the sea wall. It has been labelled SWALL7 on .

Mosaic of intertidal mud/sand and intertidal boulders/rocks (IM/IR);

- 4.2.30** Similarly, south of the power station, there is an area (labelled IM/IR1) where mud has deposited above the rock armour, behind the brown algal bed. A number of boulders and rocks that are part of the rock armour or have been dislodged from it and displaced by the waves still emerge from the mud, forming a mosaic of intertidal mud and intertidal boulders/rocks. This area covers approximately 892m².

Mosaic of intertidal shingle and dense/continuous saltmarsh (ISC/DSM)

- 4.2.31** In the eastern part of the survey area, just beneath the soft cliff described above, there is an area of saltmarsh that is currently being eroded and replaced with artificial shingle reworked by the sea (ISC/DSM1). It covers 0.1ha.

Mosaic of poor semi-improved grassland and dense/continuous saltmarsh (DSM/SI)

- 4.2.32** East of the power station main jetty, between the footpath and the saltmarsh, there is a long and narrow strip of habitat transitional between a poor semi-improved grassland and upper saltmarsh habitats. Tall fescue (*Schedonorus arundinaceus*) and sea couch are abundant, tufted vetch (*Vicia cracca*), rough hawkbit (*Leontodon hispidus*), cow parsley (*Anthriscus sylvestris*) and sea-purslane are occasional. Less abundant species include yarrow (*Achillea millefolium*), carrot

(*Daucus carota*), bristly oxtongue (*Helminthotheca echioides*), black medick (*Medicago lupulina*), dandelion (*Taraxacum* sp.), cock's-foot (*Dactylis glomerata*) and goat's-beard (*Tragopogon pratensis*).

Mosaic of poor semi-improved grassland, scattered scrub, dense/continuous saltmarsh and sea wall (SI/SS/DSM/SWALL);

- 4.2.33** Further east, the mosaic described above seems to have developed over the top of the rock armour, which, in this area, is made of boulders or concrete tiles sealed with asphalt or concrete. Patches of bare rocks or concrete tiles are still visible in places, with the vegetation growing preferentially along the joints in the rock armour. In addition, scattered dog-roses and brambles have developed within this habitat (Photograph 6 on).

Mosaic of poor semi-improved grassland and tall ruderal (SI/TR)

- 4.2.34** East of the ash fields, recent earthworks have disturbed the ground on the terrace located out of reach of the sea, above the small soft cliff. The vegetation in this area (labelled SI/TR1) is a mosaic of grassland species and tall ruderal species, with a small number of species usually growing on upper saltmarshes including rare sea beet and abundant sea couch. Cleavers is abundant, and false oat-grass, hemlock (*Conium maculatum*), bastard cabbage (*Rapistrum rugosum* subsp. *linnaeanum*) and common nettle are frequent. Other species include occasional barren brome (*Anisantha sterilis*), wormwood (*Artemisia absinthium*), creeping thistle, cock's-foot, hoary cress (*Lepidium draba* subsp. *draba*), common mallow (*Malva sylvestris*) and tall fescue; and rare hedge bindweed, wild teasel (*Dipsacus fullonum*), cotton thistle (*Onopordum acanthium*), blackthorn, dog-rose and white campion (*Silene latifolia*). SI/TR2 is an area of similar vegetation east of the barge loading area. The combined area of SI/TR1 and SI/TR2 is 0.7ha.

Mosaic of bare ground and ephemeral/short perennial (BG/ESP).

- 4.2.35** In the eastern part of the survey area, ephemeral/short perennial vegetation has started to colonise two areas of bare ground along the recently relocated footpath. These are labelled BG/ESP1 and BG/ESP2, and cover a total area of approximately 630m². Plants currently cover approximately 30% to 40% of the ground (Photograph 5 on). Rough hawkbit is frequent, and is accompanied by a large number of rare to occasional species including barren brome, false oat-grass, soft-brome (*Bromus hordeaceus*), cock's-foot, bristly oxtongue, spotted medick (*Medicago arabica*), black medick, greater plantain (*Plantago major*), rat's-tail fescue (*Vulpia myuros*), dove's-foot crane's-bill (*Geranium molle*), Yorkshire-fog (*Holcus lanatus*), wall barley (*Hordeum murinum*), common bird's-foot-trefoil (*Lotus corniculatus*), ribwort plantain (*Plantago lanceolata*), annual beard-grass (*Polypogon monspeliensis*) and white clover (*Trifolium repens*).

Fauna

- 4.2.36** One shelduck (*Tadorna tadorna*) and six mallards (*Anas platyrhynchos*) were incidentally recorded feeding on mudflats east of the power station (TN1 below).
- 4.2.37** Numerous insect burrows, including of burrowing bees, were observed on the soft cliff in the east of the survey area (TN10 below).

Target Notes

4.2.38 Target notes were recorded during the field survey to highlight specific features of ecological interest, or to show particular areas within habitat parcels where vegetation was surveyed more exhaustively, hereafter referred to as 'vegetation survey plots'. Target notes are listed below, and the full species list for each vegetation survey plot is given in Appendix 2:

- TN1 - One shelduck and six mallards foraging on mudflat;
- TN2 - Vegetation survey plot for DSM1;
- TN3 - Vegetation survey plot for DS1;
- TN4 - Vegetation survey plot for DSM2;
- TN5 - Vegetation survey plot for TR1;
- TN6 - Vegetation survey plot for DSM4;
- TN7 - Vegetation survey plot for DSM/SI1;
- TN8 - Vegetation survey plot for SI/TR1;
- TN9 - Vegetation survey plot for DSM6;
- TN10 - Presence of numerous insect burrows in the soft cliff;
- TN11 - Vegetation survey plot for BG/ESP1.

5. Legislation and Planning Policy Considerations

5.1 Background

5.1.1 The content of the legislation and planning policy section is the legislation and planning policy considerations that we know are relevant based on this extended Phase 1 habitat survey. The legislation and policy considerations that might arise following further surveys are excluded. Potential further ecological considerations, i.e. protected species and species of conservation concern that may be present within the site due to the presence of suitable habitats but that were not recorded as this would require additional surveys with a different methodology, are not discussed in this chapter.

5.2 Priority Habitats

5.2.1 Section 40 of the Natural Environment and Rural Communities Act (NERC Act) 2006 places a duty on all public authorities (including LPAs) to have regard to the purpose of conserving biodiversity in all of their functions. This duty extends to restoring or enhancing habitats or populations. Section 41 of the NERC Act requires the Secretary of State to establish and maintain a list of habitats (HPI) and species (SPI) of principal importance (also referred to as priority species and priority habitats) in relation to this duty. The Secretary of State must also take measures to further the conservation of these habitats and species and promote the taking of such measures by others.

5.2.2 The NPPF states that:

“planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss”.

5.2.3 There are two HPis within the site: coastal saltmarsh, and intertidal mudflats. The development has the potential to have a negative effect on coastal saltmarsh and intertidal mudflats within the survey area, either through direct damage during the construction phase or indirect damage during the operational phase following changes in erosion and accretion caused by the extension of the jetty, removal of the Anglian Water jetty and dredging.

5.3 Protected Species

5.3.1 One shelduck (*Tadorna tadorna*) and six mallards (*Anas platyrhynchos*) were incidentally recorded feeding on mudflats. All wild birds, their eggs and their nests are protected under the Wildlife and Countryside Act 1981, as amended. This makes it an offence, with certain exceptions to intentionally:

- Kill, injure or take any species of wild bird;
- Take, damage or destroy their nest while that nest is in use or being built; or
- Take or destroy their eggs.

5.3.2 The development has the potential to result in bird nests or eggs being damaged or destroyed.

5.3.3 No other protected species were recorded within the survey area during the Phase 1 survey; however, there is habitat within the site that could potentially be used by protected species comprising: marine mammals, bats, birds, reptiles, and invertebrates.

5.4 Other Species of Conservation Concern

5.4.1 Three plant species of conservation concern, listed as Nationally Scarce, were recorded during the survey. These are golden-samphire, annual beard-grass and dittander.

5.4.2 Golden-samphire was recorded in several places in the saltmarsh habitats located east of the main jetty (DSM4). Dittander was recorded in saltmarsh habitats along the creek west of the sewage works (DSM2). Annual beard-grass was recorded in the area of bare ground and ephemeral/short perennial vegetation (BG/ESP1) in the eastern end of the survey area.

5.4.3 The development is unlikely to have an impact on the annual beard-grass population within the site because the latter is located several hundred metres away from the proposed works, on a terrace unlikely to be impacted in the short or medium term by changes in erosion patterns potentially resulting from the development.

5.4.4 The development has the potential to have a negative effect on golden-samphire and dittander, through direct damage during the construction phase if machinery is allowed to move on saltmarsh habitats, or through indirect damage during the operational phase following changes in erosion and accretion caused by the extension of the jetty, removal of the Anglian Water jetty and dredging.

5.4.5 Both shelduck and mallard are amber-listed species in the Birds of Conservation Concern 4 (Eaton *et al.* 2015). The development has the potential to have a negative effect on these two species by reducing the area of mudflats in the immediate vicinity of the site through direct destruction during the construction phase or through indirect damage during the operational phase following changes in erosion and accretion caused by the extension of the jetty, removal of the Anglian Water jetty and dredging. In addition the creation of additional structures and the increase in human presence may lead to a lower suitability of these mudflats for foraging wildfowl.

5.4.6 As species of conservation concern, golden-samphire, dittander, annual beard-grass, shelduck and mallard should be taken into account by the local planning authority when performing its duties; however they receive no specific legal or policy protection, except for the general protection of all birds by the Wildlife and Countryside Act 1981, as amended (WCA), which applies to shelduck and mallard.

6. Conclusion

- 6.1.1 An extended Phase 1 habitat survey of intertidal habitats was completed in the vicinity of the proposed Tilbury2 marine terminal in Tilbury.
- 6.1.2 The extended Phase 1 habitat survey found that two priority habitats (coastal saltmarsh and mudflats) and three plant species of conservation concern are present within the site. There are also habitats that could potentially support other protected species and species of conservation concern, the observation of which would require further surveys with different methodologies.
- 6.1.3 The development has the potential to have negative effects on both priority habitats and on two species of conservation concern that were recorded within the survey area. It also has the potential to have negative effects on protected species and species of conservation concern that may be present within the survey area but have not been observed during the extended Phase 1 survey.

7. References

- 7.1.1 Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D. & Gregory, R. (2015) Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds*, 108, 708-746.
- 7.1.2 Institute of Environmental Assessment (1995) Guidelines for Baseline Ecological Assessment. E & FN Spon, London, England.
- 7.1.3 JNCC (2010) Handbook for Phase 1 habitat survey: A technique for environmental audit. Joint Nature Conservancy Committee, Peterborough, England.
- 7.1.4 Stace, C. (2010) New Flora of the British Isles (third edition). Cambridge University Press, Cambridge, England.

Appendix 1 - Vascular Plant Species Recorded during the Extended Phase 1 Habitat Survey

DS1 (Target Note TN3)

Species name	Common name	Abundance
<i>Crataegus monogyna</i>	hawthorn	F
<i>Rubus fruticosus</i> agg.	bramble	F
<i>Prunus spinosa</i>	blackthorn	O
<i>Pyrus communis</i>	pear	R
<i>Rosa canina</i>	dog-rose	R

SS1, SS2, SS3 and SS4.

Species name	Common name	Abundance
<i>Rubus fruticosus</i> agg.	bramble	D
<i>Prunus spinosa</i>	blackthorn	F
<i>Rosa</i> sp.	a rose	F
<i>Foeniculum vulgare</i>	fennel	O
<i>Malva sylvestris</i>	common mallow	R
<i>Rumex obtusifolius</i>	broad-leaved dock	R
<i>Sambucus nigra</i>	elder	R

TR1 (Target Note TN5)

Species name	Common name	Abundance
<i>Arrhenatherum elatius</i>	false oat-grass	A
<i>Cirsium arvense</i>	creeping thistle	A
<i>Urtica dioica</i>	common nettle	A
<i>Rubus fruticosus</i> agg.	bramble	F
<i>Calystegia sepium</i>	hedge bindweed	O
<i>Galium aparine</i>	cleavers	O
<i>Galium album</i>	hedge bedstraw	R

SI/TR1 (Target Note TN8)

Species name	Common name	Abundance
<i>Elytrigia atherica</i>	sea couch	A
<i>Galium aparine</i>	cleavers	A
<i>Arrhenatherum elatius</i>	false oat-grass	F
<i>Conium maculatum</i>	hemlock	F
<i>Rapistrum rugosum</i> subsp. <i>linnaeanum</i>	bastard cabbage	F
<i>Urtica dioica</i>	common nettle	F
<i>Anisantha sterilis</i>	barren brome	O
<i>Artemisia absinthium</i>	wormwood	O
<i>Cirsium arvense</i>	creeping thistle	O
<i>Dactylis glomerata</i>	cock's-foot	O
<i>Lepidium draba</i> subsp. <i>draba</i>	hoary cress	O
<i>Malva sylvestris</i>	common mallow	O
<i>Schedonorus arundinaceus</i>	tall fescue	O
<i>Beta vulgaris</i> subsp. <i>maritima</i>	sea beet	R
<i>Calystegia sepium</i>	hedge bindweed	R
<i>Dipsacus fullonum</i>	wild teasel	R
<i>Onopordum acanthium</i>	cotton thistle	R
<i>Prunus spinosa</i>	blackthorn	R
<i>Rosa</i> sp.	a rose	R
<i>Silene latifolia</i>	white campion	R

DSM1 (Target Note TN2)

Species name	Common name	Abundance
<i>Aster tripolium</i>	sea aster	A
<i>Spartina</i> sp.	a cord-grass	A
<i>Cochlearia anglica</i>	English scurvygrass	F
<i>Plantago maritima</i>	sea plantain	F
<i>Atriplex portulacoides</i>	sea-purslane	O

DSM2 & DSM8 (Target Note TN4)

Species name	Common name	Abundance
<i>Elytrigia atherica</i>	sea couch	A
<i>Atriplex portulacoides</i>	sea-purslane	D
<i>Aster tripolium</i>	sea aster	F
<i>Plantago maritima</i>	sea plantain	F
<i>Triglochin maritima</i>	sea arrowgrass	F
<i>Juncus gerardii</i>	saltmarsh rush	O
<i>Puccinellia maritima</i>	common saltmarsh-grass	O
<i>Spartina</i> sp.	a cord-grass	O
<i>Spergularia media</i>	greater sea-spurrey	O
<i>Cochlearia anglica</i>	English scurvygrass	R
<i>Glaux maritima</i>	sea-milkwort	R
<i>Lepidium latifolium</i>	dittander	R
<i>Limonium vulgare</i>	common sea-lavender	R

DSM4 (Target Note TN6)

Species name	Common name	Abundance
<i>Atriplex portulacoides</i>	sea-purslane	A
<i>Plantago maritima</i>	sea plantain	A
<i>Triglochin maritima</i>	sea arrowgrass	A
<i>Aster tripolium</i>	sea aster	F
<i>Elytrigia atherica</i>	sea couch	F
<i>Festuca rubra</i>	red fescue	F

Species name	Common name	Abundance
<i>Spartina</i> sp.	a cord-grass	F
<i>Glaux maritima</i>	sea-milkwort	O
<i>Limonium vulgare</i>	common sea-lavender	O
<i>Spergularia media</i>	greater sea-spurrey	O
<i>Cochlearia anglica</i>	English scurvygrass	R
<i>Inula crithmoides</i>	Golden-samphire	R
<i>Phragmites australis</i>	common reed	R
<i>Puccinellia maritima</i>	common saltmarsh-grass	R

DSM/SI1 (Target Note TN7)

Species name	Common name	Abundance
<i>Elytrigia atherica</i>	sea couch	A
<i>Schedonorus arundinaceus</i>	tall fescue	A
<i>Anthriscus sylvestris</i>	cow parsley	F
<i>Atriplex portulacoides</i>	sea-purslane	F
<i>Leontodon hispidus</i>	rough hawkbit	F
<i>Vicia cracca</i>	tufted vetch	F
<i>Achillea millefolium</i>	yarrow	O
<i>Daucus carota</i>	carrot	O
<i>Helminthotheca echioides</i>	bristly oxtongue	O
<i>Medicago lupulina</i>	black medick	O
<i>Taraxacum</i> sp.	a dandelion	O
<i>Dactylis glomerata</i>	cock's-foot	R
<i>Tragopogon pratensis</i>	goat's-beard	R

BG/ESP2 (Target Note TN11)

Species name	Common name	Abundance
<i>Leontodon hispidus</i>	rough hawkbit	F
<i>Anisantha sterilis</i>	barren brome	O
<i>Arrhenatherum elatius</i>	false oat-grass	O
<i>Bromus hordeaceus</i>	soft-brome	O

Species name	Common name	Abundance
<i>Dactylis glomerata</i>	cock's-foot	O
<i>Helminthotheca echioides</i>	bristly oxtongue	O
<i>Medicago arabica</i>	spotted medick	O
<i>Medicago lupulina</i>	black medick	O
<i>Plantago major</i>	greater plantain	O
<i>Vulpia myuros</i>	rat's-tail fescue	O
<i>Geranium molle</i>	dove's-foot crane's-bill	R
<i>Holcus lanatus</i>	Yorkshire-fog	R
<i>Hordeum murinum</i>	wall barley	R
<i>Lotus corniculatus</i>	common bird's-foot-trefoil	R
<i>Plantago lanceolata</i>	ribwort plantain	R
<i>Polypogon monspeliensis</i>	annual beard-grass	R
<i>Trifolium repens</i>	white clover	R