



Ecological Appraisal

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Portishead Railway

North Somerset Council

13 April 2011



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Document history

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Executive Summary

Halcrow has been commissioned by North Somerset Council to undertake an ecological appraisal for the disused Portishead Railway between Portishead and Lodway, centred on ST 496 756. This report provides a technical appraisal, through desk study combined with a field survey, of the likely potential impacts of the proposal to re-open the railway on habitats and species in order to inform the need for further detailed surveys.

There are four internationally designated sites for nature conservation located within 5km of the site, namely the Seven Estuary SAC, SPA and Ramsar Site and Avon Gorge Woodlands SAC. The Seven Estuary is also an SSSI and at its closest is within 1km of the site. The Avon Gorge Woodlands are approximately 3km from the site. It is recommended that Habitats Regulations Assessment screening is undertaken.

Five non-statutory Wildlife Sites are located adjacent to the site and many more are located within 0.5km of the railway. It is recommended that potential construction impacts are avoided by employing good construction practices to prevent direct disturbance and indirect impacts. In addition it is recommended that habitat connectivity across the railway is maintained through appropriate measures.

The site is predominantly scrub habitat with some stretches that have developed characteristics of linear woodlands, with mature trees also present. Other habitats present are semi-improved and amenity grassland, tall ruderal vegetation, reedbed, watercourses, ponds and structures including bridges, culverts and a single brick building. It is recommended that continuous belts of scrub or linear woodland and mature trees to either side of the tracks are retained, where possible, to preserve connectivity of the green corridor. It is also recommended that watercourses and ponds protected during construction using water pollution prevention measures and are restored and enhanced to maximise opportunities for species.

The ecological appraisal has identified that the site supports badgers and has potential to support amphibians, breeding birds, bats, invertebrates, reptiles, water vole and other notable species. Therefore, it is recommended that:

- Six waterbodies within or close to the boundary of the site, are surveyed the presence of great crested newt. A further six waterbodies within 250m of the site should be assessed for habitat suitability for the species, and if suitable should also be surveyed;
- Site clearance is undertaken in association with an ecological watching brief for badger setts. If badger setts cannot be avoided, then a badger mitigation strategy and potentially a Natural England licence may be required;
- Bat surveys are undertaken to establish if and how bats are using the site, determine locations of roosts and identify species and population sizes;
- A breeding bird survey is undertaken;
- A terrestrial invertebrate survey is undertaken;
- A reptile survey is undertaken; and
- Water vole survey is carried out at two locations.

The appraisal concludes that subject to the implementation of the recommended measures, and findings of the protected species surveys that the proposed development could be implemented without significant adverse ecological impacts and will be in accordance with legal and policy requirements.

1 Introduction

Halcrow Group Limited has been commissioned by North Somerset Council to undertake an ecological appraisal for the proposed Portishead Railway between Royal Portbury Docks and Lodway, hereafter referred to as the 'site'. The site is located within North Somerset and centred on Ordnance Survey Grid Reference OSGR ST 496 756 (Figure 1, Appendix B). The site comprises the disused railway line and, at the western end, adjoining land.

The purpose of this report is to provide a technical appraisal of the likely potential impacts of the proposal to re-open the railway on the habitats and species present, within and adjacent to the site, in order to inform the need for further detailed species and habitat surveys.

The report is structured as follows:

- Section 2 – *Methodology*. This section summarises the methodology used for undertaking the desk study and field surveys. In addition it describes the basis for the evaluation of ecological features;
- Section 3 – *Legislation, Planning Policy and Biodiversity Action Plan Context*. This section sets out the considerations made while undertaking the ecological appraisal and informs the recommendations set out in Section 5;
- Section 4 – *Baseline Conditions*. This section describes the findings and context of the site with respect to the Natural Area profile, designated sites, habitats and flora and fauna. In addition, it identifies any actual or potential protected/notable habitat or species issues which have been found; and
- Section 5 – *Evaluation and Recommendations*. This section sets out the conclusions and recommendations of the ecological appraisal in relation to relevant legislation, planning policy and nature conservation strategies as set out in Section 3.

2 Methodology

2.1 Desk Study

A desk study was conducted for a search area encompassing the site and surrounding land within a 0.5km buffer from the site for all records, within 2.5km for bats and within 5km for internationally designated sites. This area was considered to be sufficient to cover the likely zone of influence of the proposed scheme. Data sources consulted during the desk study were:

- the Government's 'Multi-agency Geographic Information for the Countryside' (MAGIC) website for statutory designations; and
- Bristol Regional Environmental Records Centre (BRERC), for protected, notable and Biodiversity Action Plan (BAP) species data, local habitats data, and descriptions for Local Nature Reserves, non-statutory designated sites and Wildlife Trust reserves.

This consultation exercise is valuable in identifying past records and nature conservation designations. Understanding nature conservation issues within the wider area helps in the assessment of the ecological value of a site and the habitats and species that a site supports.

Where applicable, information supplied by these organisations has been incorporated into the following account with due acknowledgement where they are particularly informative or relevant.

2.2 Field Survey

An extended Phase I Habitat Survey of the site was undertaken by two experienced ecologists on 22nd and 24th March 2011. The field survey technique adopted was at a level intermediate between the Joint Nature Conservation Committee standard 'Phase I' habitat survey and 'Phase II' more detailed survey (JNCC, 2010). The scope and detail of the surveys undertaken follow the recommendations made by the former Institute of Environmental Assessment (1995).

The habitats were classified and mapped, and dominant plant species were recorded. Nomenclature for plant species follows that of Stace (2010). Note was taken of the more conspicuous fauna, and any evidence of, or potential for the presence of protected, notable or BAP species was recorded within the site and immediately around the site.

The weather conditions during the survey on both days were dry with hazy sunshine. On the 22nd there was a light north-westerly breeze and on the 24th there was a light easterly breeze. Temperatures ranged between 10°C and 19°C on both days.

2.3 Evaluation

The habitats and species evaluations are based on the guidance from the Institute of Environmental Management (IEEM, 2006). The level of value of specific ecological receptors is assigned using a geographic frame of reference, i.e. international value being most important, then national, regional, county, district, local and lastly, within the immediate zone of influence of the proposals only.

Value judgements are based on various characteristics that can be used to identify ecological resources or features likely to be important in terms of biodiversity. These include site designations (such as Sites of Special Scientific Interest (SSSI)), or for undesignated features, the size, conservation status (either locally, nationally or internationally), and the quality of the ecological resource. In terms of the latter, 'quality' can refer to habitats (for instance if they are particularly diverse, or a good example of a specific habitat type), other features (such as wildlife corridors or mosaics of habitats) or species populations or assemblages.

2.4 Limitations

Populations of animals and plants are often transient in nature and a single survey visit can only provide a general indication of species present on site. The time of year when the survey was carried out and other variations will also influence the results of the survey as many species are not present at all times of year. Therefore, although evidence of a species may not be recorded it does not mean that the species may not be present at more favourable times of year.

Although every attempt was made to access the whole length of the site, close inspection of areas of very dense scrub was not always possible. In such areas, where there was evidence of animal activity or paths entering, the potential for the scrub to conceal features such as mammal holes has been noted.

Adjacent habitats and land uses have been recorded wherever practicable, however, in some locations these could not be identified and are therefore not represented in the habitat plans.

The recommendations made within this report take full account of these limitations.

3 Legislative, Planning and Biodiversity Action Plan Context

3.1 Legislative Framework

Specific habitats and species receive legal protection in the UK under various pieces of legislation, including:

- The Wildlife and Countryside Act 1981 (as amended);
- The Protection of Badgers Act 1992;
- The Hedgerow Regulations 1997; and
- The Conservation of Habitats and Species Regulations 2010.

Where relevant, the ecological appraisal takes account of the legislation protection afforded to specific habitats and species.

3.2 Planning Policy

3.2.1 Planning Policy Statement Note 9 – Biodiversity and Geological Conservation

Planning Policy Statement 9 (PPS9), published in August 2005, outlines the Government's commitment to the conservation of wildlife and natural features. It is mainly concerned with the protection of statutorily designated sites, although PPS9 also seeks to ensure that planning policies maintain, enhance restore or add to biodiversity and geological conservation interests. The policies and guidance within PPSs are a material planning consideration.

3.2.2 North Somerset Local Development Framework

The North Somerset Replacement Local Plan (RLP) is part of North Somerset's Local Development Framework and was adopted in 2007. Several of the policies within this plan have been saved until they are replaced by Local Development Framework policies. Saved policies of relevance to biodiversity are:

- ECH 10 Biodiversity. *"Development that is likely to have a significant impact upon biodiversity will not be permitted unless there is an overriding need for the development in the proposed location or measures can be introduced to mitigate such an impact."*
- ECH 11 Protected species and their habitats. *"Development which could harm, directly or indirectly, nationally or internationally protected species of flora or fauna or the habitats used by such species will not be permitted unless that particular harm could be avoided or mitigated and the species protected by the use of planning conditions or planning obligations."*
- ECH 12 Wildlife sites of international importance. *"Development which would be likely to have a direct or indirect adverse effect or which conflicts with the conservation objectives of a potential, candidate or designated Special Protection Area, Special Area of Conservation, or Ramsar Site will not be permitted."*
- ECH 13 Sites of special scientific interest and national nature reserves. *"Development within or near a Site of Special Scientific Interest (SSSI) or National Nature Reserve that is likely to have a direct or indirect adverse effect on its biodiversity"*

or geological interest will not be permitted unless other material considerations outweigh the loss of biodiversity or geological value of the site concerned and any broader impact upon the national network of SSSIs."

- ECH 14 Wildlife and geological sites and local nature reserves. *"Planning permission will not be granted for development that would have a significant adverse effect on local biodiversity or geological interests, unless the importance of the development outweighs the value of the substantive interest present."*

Supplementary Planning Advice is also provided for biodiversity and trees. This provides information on the hierarchy of wildlife sites, protected species and a five-point approach that; *"(i) Avoids, wherever possible, the adverse effects on wildlife species and habitats (ii) Compensates to offset any residual harm (iii) Identifies opportunities to provide new benefits for wildlife (iv) Mitigates in order to minimise any adverse effects and (v) Seeks information on the potential effects of development."*

3.3 Biodiversity Action Plan

Following the Convention on Biological Diversity (1992), the UK Biodiversity Action Plan (BAP) was published in 1994 and revised in 2007 to guide national strategy for the conservation of biodiversity. BAPs are now the key nature conservation initiative in the UK, working at national, regional and local levels. The North Somerset Local BAP (LBAP) (2005) currently contains ten Habitat Action Plans (HAPs) for key habitats, of which all are considered potentially relevant to the site and adjacent areas, namely:

- Coastal and floodplain grazing marsh;
- Estuary;
- Fen, marsh and swamp;
- Field boundaries and linear features;
- Rivers and streams;
- Species-rich grasslands;
- Standing open water;
- Traditional orchards;
- Urban; and
- Woodlands.

The LBAP contains four Species Action Plans (SAPs), of which all are considered potentially relevant to the site and adjacent areas:

- Greater horseshoe bat *Rhinolophus ferrumequinum*;
- Otter *Lutra lutra*;
- Water shrew *Neomys fodiens*; and
- Water vole *Arvicola amphibius*.

4 Baseline

4.1 Context

The site is approximately 5km long, extending between Portishead Marina in the west and Lodway, near Pill, in the east. The site passes through (from east to west): new office and residential developments on the eastern edge of Portishead; through a rural area around Sheepway; past Royal Portbury Dock car storage areas (north of the site) and rural fields (south of the site) and terminates at an existing live railway line (Portbury Dock freight line). The site crosses a major drain at the western end. Fences and minor drainage ditches bound the majority of the site to either side. There are five road bridges crossing the site, including the M5 motorway. The terrain around the site is relatively flat.

For target notes and photographs see Appendix A. The following accounts should be read in conjunction with Figure 2 (Appendix B).

4.2 Natural Area

The site is located within the Natural England defined Severn and Avon Vales Natural Area (Number 56) with the far eastern end falling within Bristol, Avon Valleys and Ridges Natural Area (Number 62).

The Severn and Avon Vales are an area of undulating low-lying land. The river floodplains regularly flood in winter, including seasonally flooded washland and there are relict wetland sites and features such as old pollards, wet pastures, ditches and tall hedges. The Gordano Valley is the only part of the Natural Area overlying significant peat deposits, providing a link in character with the Somerset Levels.

The Bristol, Avon Valleys and Ridges Natural Area is a complex and variable landscape, characterised by alternating ridges and broad valleys with some steep wooded slopes and open rolling farmland. The large urban expanse of Bristol and the limestone Avon Gorge dominate the central part. The gorge supports screes, scrub, pockets of grassland and adjacent woodland with an exceptional number of nationally rare and scarce plant species. Elsewhere the area supports parklands of conservation value, limited areas of calcareous grasslands and a number of significant water bodies including reservoirs and some wildlife-rich rivers and streams.

4.3 Designated Sites

Maps provided by BRERC showing the locations of the following designated sites are provided in Appendix C.

There are four internationally designated sites within a 5km radius of the site, namely: The Severn Estuary Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar site is located within 1.5km from the site and as close as 0.8km to the eastern end of the site; and Avon Gorge Woodlands SAC, which is located approximately 3km east from the site.

The Severn Estuary is designated for the following features:

- SAC - Annex I habitats (primary reason for designation); estuaries, mudflats and sandflats not covered by seawater at low tide, Atlantic salt meadows (*Glauco-*

Puccinellietalia maritimae). Annex I habitats (not primary reason for selection but is a qualifying feature); sandbanks which are slightly covered by sea water all the time, reefs.

- SAC - Annex II species (primary reason for designation). Sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, Twaite shad *Alosa fallax*.
- SPA - Over-wintering assemblage and numbers of tundra swan *Cygnus columbianus bewickii*, white-fronted goose *Anser albifrons albifrons*, shelduck *Tadorna tadorna*, Gadwall *Anas strepera*, Dunlin *Calidris alpina*, redshank *Tringa totanus*.
- Ramsar (General overview) - "The estuary's classic funnel shape, unique in Britain, is a factor causing the Severn to have the second-largest tidal range in the world (after the Bay of Fundy, Canada). This tidal regime results in plant and animal communities typical of the extreme physical conditions of liquid mud and tide swept sand and rock. A further consequence of the large tidal range is the extensive intertidal zone, one of the largest in the UK, comprising mudflats, sand banks, shingle, and rocky platforms. Glassworts and annual sea-blite colonise the open mud, with beds of all three species of eelgrass *Zostera* occurring on more sheltered mud and sandbanks." (JNCC website).

Avon Gorge Woodlands SAC is designated for the woodland habitats of slopes, screes and ravines (primary reason for selection) and semi-natural dry grasslands and scrubland facies: on calcareous substrates (not primary reason for designation but a qualifying feature).

The Severn Estuary SSSI (covered by the SAC, SPA and Ramsar designations) is the only SSSI within search area.

There are no Local Nature Reserves within 0.5km of the site, however St George's Flower Bank is just beyond the boundary to the southwest of the site.

There are many Wildlife Sites (WS) (non-statutory designated sites within North Somerset) and Sites of Nature Conservation Importance (SNCI) (non-statutory designated sites within the city of Bristol) within 0.5km of the site. Five are located immediately adjacent to the site, namely:

- Portbury Wharf Nature Reserve WS (also an Avon Wildlife Trust Nature Reserve) - open water and associated habitats, with invertebrates and migrating wildfowl;
- Fields between railway line and A369 Portbury WS (part of which is Priory Farm Avon Wildlife Trust Nature Reserve) - marshy grassland;
- Drove Rhyne and adjacent fields WS - swamp, standing water (ditches), and semi-improved neutral grassland;
- Field east of Court House WS - unimproved neutral grassland; and
- Field east of M5 motorway, Lodway WS - marshy grassland and semi-improved neutral grassland.

Other sites within or just beyond the 0.5km search area are:

- Portbury Wharf WS - marshy grassland, open water and associated habitats. Water vole, invertebrates and migrating wildfowl;

- Fields on Caswell Moor WS - marshy grassland;
- Fields adjacent to M5 motorway, Portbury WS - semi-improved neutral grassland;
- Birch Wood and Prior's Wood WS - an ancient broadleaved woodland with mixed and coniferous plantation;
- Conygar Hill and stream WS - unimproved calcareous grassland, and intact species-rich hedge;
- Fields between A369 and M5 motorway, Portbury WS - marshy grassland;
- The Mount, Portbury WS - semi-improved neutral grassland;
- Bulling's Wood WS - semi-natural broad-leaved woodland, with mixed woodland;
- Longlands Wood WS - an ancient woodland;
- St George's Flower Bank WS - very rich unimproved neutral grassland;
- Land adjacent to Severn Estuary SSSI (Portbury) WS;
- Severn Estuary SNCI, estuary;
- River Avon SNCI, river; and
- Lamplighter's Marsh SNCI, tidal marsh.

4.4 Habitats

4.4.1 Scrub

Bramble *Rubus fruticosus* scrub with hawthorn *Crataegus monogyna* is the dominant habitat type on the site, tending to be most dense to the sides of the tracks, but regularly covering the whole of the railway corridor. Willow *Salix* sp. scrub is also frequent, where it is rooted in drainage ditches. Other frequently occurring species are self-sown silver birch *Betula pendula* and ash *Fraxinus excelsior* saplings, the latter usually on ballast in the centre of the tracks and particularly found around Sheepway Lane bridge area and to the east of the M5.

Self-sown butterfly bush *Buddleja davidii* occurs frequently and is especially abundant towards the western end of the railway. Recently planted scrub is present at both ends of the railway line corridor and comprises hawthorn, blackthorn *Prunus spinosa*, rose *Rosa* sp., privet *Ligustrum* sp. and dogwood *Cornus sanguinea*.

4.4.2 Woodland and Trees

Along two stretches of the railway line the trees have matured to form habitats with linear woodland characteristics:

- Between Quays Avenue and Sheepway Lane the woodland comprises ash and sycamore *Acer pseudoplatanus* trees with a dense hawthorn, bramble, silver birch and blackthorn understorey, with a generally bare or ivy *Hedera helix* covered ground layer.

- Further east, to either side of Portbury Dock Road a silver birch woodland has developed. Lords-and-Ladies *Arum maculatum*, hart's-tongue *Phyllitis scolopendrium*, male-fern *Dryopteris filix-mas* and cleavers *Galium aparine* are frequent in the ground flora. Around target note 14 at Quays Avenue/Harbour Road roundabout, there is a small willow and alder *Alnus glutinosa* woodland with a rose, bramble and hawthorn understorey.

Mature ash trees are present between Quays Avenue and Sheepway Lane and many of these have dense cladding of ivy providing potential bat roost opportunities (target notes 20, 21, 22, 23 and 24). Other clumps or lines of mature trees or trees with significant ivy-cladding are found at target notes 8, 32, 39, 43, 49, 51, 57, 58, 59, 61, 62, 66, 67 and 70. In scrub dominated areas between Sheepway Lane and Station Road, and east of the M5, mature but small, gnarled oaks *Quercus robur* are present.

4.4.3 Grassland

Grassland only occurs occasionally within the railway corridor in places where scrub has not yet colonised, possibly due to rabbit grazing or where there are farm crossings (target note 18, 35, 56 and 72). The exceptions are two large area of semi-improved grassland, one to the west of Quays Avenue (colt's-foot *Tussilago farfara* and sedge *Carex* sp. present with bramble and butterfly bush encroaching) and one at the far western end of the site (species include cock's-foot *Dactylis glomerata*, common bent *Agrostis capillaris*, ribwort plantain *Plantago lanceolata*, teasel *Dipsacus fullonum*, broadleaved dock *Rumex obtusifolius*, vetch *Lathyrus* sp., white clover *Trifolium repens* and creeping cinquefoil *Potentilla reptans*) where patches of bare ground are present and bramble is starting to develop within sward.

Most of the grassland is semi-improved, although tightly mown amenity grassland is present particularly at the western end of the site adjacent to roads. Semi-improved and improved grassland pasture is present in fields immediately adjacent to much of the site, some of which is classified as coastal floodplain grazing marsh priority habitat (BRERC, 2011).

4.4.4 Tall Ruderals

Tall ruderal vegetation is of limited extent within the site. Common nettle *Urtica dioica* is the dominant species, along with broad-leaved dock, rosebay willowherb *Chamerion angustifolium* and cleavers. One large area of tall ruderal is present between belts of scrub immediately west of Quays Avenue towards the west of the site.

4.4.5 Reedbed and Wetlands

At the time of the survey, many of the stands of common reed *Phragmites australis* within the railway corridor were dry, except reed growing immediately east of Portbury Dock Road, which was associated with a wet ditch. Reed stands were species-poor and generally small in extent. Large stands of reed are present immediately adjacent to the railway around The Drove, and north of the railway across a track to the east of the M5 (target note 68). Presence of hard rush *Juncus inflexus* within semi-improved grassland at the western end of the site (target note 3), and lesser pond sedge *Carex acutiformis* at target note 50, infer impeded drainage.

4.4.6 Watercourses

A number of watercourses are present passing beneath the site and also as drains parallel to the site. In most cases the watercourses parallel to and within the site were dry at the time of the survey and are considered to be ephemeral features. Where these ditches were wet, they were generally shallow and leaf filled with no emergent or aquatic vegetation, due to heavy shading.

In the west a major drain crosses beneath the railway in a deep cutting. The lower banks of this drain are piled in places and lined with concrete or brick, however soft bank is present (target note 5). East of Quays Avenue a small drain is present within the railway boundary. This drain has a two-stage concrete channel (target note 15). East of Sheepway Farm a stream marked on the map as passing beneath the railway was obscured by dense bramble. Towards Station Road a flowing stream passes beneath the railway (target note 38), which is shallow and heavily shaded and does not support aquatic or emergent vegetation.

4.4.7 Ponds

Ponds or standing water in ditches within the site are all shallow and shaded features of small extent and often covered with duckweed *Lemna minor* (target note 46, 47, 52 and 60). However, there are a number of ponds beyond the site boundary:

- Within a residential area east of Quays Avenue the pond (target note 17) has broad vegetation margins and good habitat structure for pond-life.
- North of the railway close to Station Road is a coarse fishing pond (target Note 40).
- West of Marsh Lane is a pond in a field with limited marginal vegetation (target note 53).
- East of Marsh Lane is a small pond under heavy shade to the north of the railway (target note 55).
- North of the railway and east of the M5 (target note 68) at Field east of M5 Motorway WS, is a large wetland with open water.

Estimated Habitat Suitability Index of these features for great crested newt is discussed in Section 5.3.1.

4.4.8 Structures

There are no intact buildings within the railway corridor. A derelict building is present at target note 48 and a small brick building is located immediately adjacent to the railway at target note 44. However significant structures present include five bridges over the railway at Sheepway Lane, Station Road, Portbury Dock Road, Marsh Lane and the M5, and other brick railway bridges over watercourses (target note 7 and 38) or farm access (target note 60). Sheepway Lane and Marsh Lane road bridges have voids in the brickwork and mortar (target notes 26, 27 and 54).

A number of houses with tiled roofs are present within 50m of the site, such as Sheepway Gate Farm.

4.5 Species

4.5.1 Amphibians

Four species of amphibian have been recorded within the site or a 0.5km buffer around the site (BRERC, 2011). These are great crested newt *Triturus cristatus*, smooth newt *Lissotriton vulgaris*, common toad *Bufo bufo* and common frog *Rana temporaria*. These are summarised below:

- Great crested newts: There are records for this species from within the site from the pond at target note 47, where seven individuals were recorded in 1988. Great crested newt have also been recorded from Portbury Wharf 0.25km north of the western end of the site in 2000, Portbury vole city (water vole reintroduction site) 0.25km north of the western half of the site in 2005, in a garden 0.25km south of the eastern end of the site. There are older records for the search area from the 1980s.
- Smooth newt: This species has been recorded from the pond at target note 47, with many individuals recorded in 1988. Other records are from the Portbury Docks area as recently as 2003 and from the 1980s from fields and Caswell Lane in 1km grid squares covering the site.
- Common frog: Recent records up to 2010 are from Pill at the eastern end of the railway line and M5 junction 19. Older records from the 1980s are located in fields and Caswell Lane in 1km grid squares covering the site.
- Common toad: There is only one record for this species in the search area. This is a 2010 sighting in Pill at the far eastern end of the search area.

No evidence for the presence of amphibians was recorded during this extended Phase 1 Habitat survey.

4.5.2 Badgers

There are many recent records for badger *Meles meles* within the search area (BRERC, 2011). Most of these are from the Portbury wharf area, although there are records from the Portbury Hundred, Caswell Lane and Gordano services on the east side of the M5 motorway. There are no records from within the site boundary.

An active badger sett was recorded at the western end of the survey area at target note 9. The sett is concealed beneath hawthorn scrub and could not be fully examined without unreasonable vegetation clearance in a publically accessible location, however five entrances were visible. These had bedding outside the entrances.

A further possible single-holed badger sett was recorded at target note 34 and a location of a potential badger sett, with holes and spoil heaps visible, which could not be accessed was noted at target note 36.

Further to this a disused, at least three-holed badger sett, was found near target note 52. Other signs of badgers were few, although some major mammal paths (target note 4 and 71) may be used by badger although footprints, hairs or latrines were not found.

4.5.3 Bats

Bat and bat roosts have been recorded for the following species within a 2.5km radius of the site (BRERC, 2011);

- Lesser horseshoe *Rhinolophus hipposideros* - Includes hibernation roosts. All records over 1km south of the site.
- Common *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus* - Includes a roost. Records within 1km of the site.
- Greater horseshoe bat - Includes a roost. Records over 1km southwest of the site.
- Serotine *Eptesicus serotinus* - Summer roost within a 1km grid square located over the centre of the site. Records over 2km south of the site.
- Leisler's bat *Nyctalus leisleri* - Over 1km northeast of the site and over 2km south of the site.
- Brown long-eared bat *Plecotus auritus* - Includes hibernation roost. Records with 1km of the site.
- Daubenton's bat *Myotis daubentonii* - Records over 2km southeast of the site.
- Noctule *Nyctalus noctula* - Records within 1km of the site.

No signs of bats, such as staining or droppings were observed during the survey, however trees with bat roost potential (broken boughs, crevices or dense ivy-cladding at target notes 14, 20, 21, 22, 23, 24, 43, 49, 51, 57, 58, 59, 61 and 62) and structures with bat roost potential (target notes 7, 26, 27, 48, 54 and 60) were recorded. Also linear features that may be of importance for bat commuting and foraging were present including the railway corridor and perpendicular habitats such as the major drain at target note 5. Farm and residential buildings within 50m of the railway such as Sheepway Gate Farm may have bat roost potential.

4.5.4 Birds

Numerous bird records have been provided for the search area (BRERC, 2011). These include Red listed species¹ (Eaton *et al.*, 2010), birds listed on Section 41² of the

¹ Birds that meet one of the following criteria (i) globally threatened, (ii) historical population decline in UK during 1800–1995, (iii) severe (at least 50%) decline in UK breeding population over last 25 years, or longer-term period (the entire period used for assessments since the first BoCC review, starting in 1969) or (iv) severe (at least 50%) contraction of UK breeding range over last 25 years, or the longer-term period.

² Species of principal importance for biological conservation in England.

Natural Environment and Rural Communities Act (NERC) 2006, and species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Many species of wetland bird have been recorded, due to the proximity to the Severn Estuary (see Section 4.3), and there are records for ground nesting species, raptors and passerine species.

During the survey passerine birds were abundant throughout the length of the railway. Species recorded were blackbird *Turdus merula*, bullfinch *Pyrrhula pyrrhula*, great tit *Parus major*, green woodpecker *Picus viridis*, long-tailed tit *Aegithalos caudatus*, robin *Erithacus rubecula* and starling *Sturnus vulgaris*, with coot *Fulica atra* and mallard *Anas platyrhynchos* on waterbodies beyond the site. A particularly notable location of starling activity was within scrub at target note 16.

4.5.5 Dormouse

There are no records of dormouse *Muscardinus avellanarius* within the search area (BRERC, 2011).

No evidence of dormouse or notable dormouse habitat was recorded during the survey and the railway corridor does not link with any major wooded corridors. Therefore this species is not considered further in his report.

4.5.6 Invertebrates

Numerous invertebrate records have been provided for the search area (BRERC, 2011). These include records for notable beetles, dragonfly and other odonata, grasshoppers and crickets, butterflies and moths, many of which are listed on Section 41 of the NERC Act 2006.

A number of invertebrates were recorded during the survey. These were generally clustered in the semi-improved grassland and tall ruderal vegetation within the site (target notes 2, 10, 11 and 13). Species recorded include:

- A red-tailed bumblebee *Bombus* sp. was recorded at target note 3;
- Small tortoiseshell *Aglais urticae* was recorded at several locations;
- Brimstone *Gonepteryx rhamni* recorded on common nettle dominated tall ruderal vegetation at target note 11;
- A painted lady *Vanessa cardui* was recorded near to target note 13.

In addition, mature trees for example at target note 62 may have potential to support deadwood invertebrate species. There were no watercourses considered suitable for white-clawed crayfish *Austropotamobius pallipes* and this species is not considered further in this report.

4.5.7 Otter

Records provided by BRERC (2011) show that in 2000 an otter spraint was recorded by a ditch approximately 0.5km south of the central part of the site. An immature otter was also recorded dead on the A369 near this location.

No signs of otter or potential otter habitat were recorded during the survey and it is therefore not considered further in this report.

4.5.8 Plants

Numerous records of notable plants have been provided for the search area (BRERC 2011). Of these, early marsh-orchid *Dactylorhiza incarnata* (Section 41 of NERC Act 2006), located within 100m of the site within Fields between A369 and M5 motorway, Portbury WS, is of most relevance to the site.

No notable or invasive non-native plant species were recorded during the survey and plant species are not specifically considered further in this report.

4.5.9 Reptiles

Recent records show that grass snake *Natrix natrix* and slow worm *Anguis fragilis* are both present in the search area (BRERC, 2011). Grass snake have been recorded near Marsh Lane in close proximity to the site (possibly within the site) and also 0.5km north of the western end of the site in the Portbury Wharf area. Slow worm records are more numerous and are also from the Portbury Wharf area as well as gardens in Lodway and Pill at the eastern end of the search area.

No reptiles or evidence of reptile presence was recorded during this survey.

4.5.10 Water Shrew

There are no records for water shrew within the search area (BRERC, 2011).

No evidence of water shrew was recorded during the survey and suitable habitat within the site was restricted to the drain at target note 5.

4.5.11 Water Vole

A significant population of water vole have been recorded recently (2007) in Drove Rhine approximately 0.75km to the north of the site (BRERC, 2011). This species has also been reintroduced to Portbury Wharf Nature Reserve with extends to immediately adjacent to the site (see Appendix B for location).

No signs of water vole were observed during the survey. Although a number of ditches are present within the site. Only the major drain at the western end of the site at target note 5 and the pond at target note 47 support habitat with sufficient depth and bankside vegetation to be suitable to support water voles.

4.5.12 Other Notable Species

Records for other notable species of relevance to the site provided by BRERC include:

- Brown hare *Lepus europaeus*, listed on Section 41 of NERC Act 2006, located mainly around Portbury Wharf area at the western end of the site; and
- Hedgehog *Erinaceus europaeus*, listed on Section 41 of NERC Act 2006, various locations.

No evidence of these species was observed during the survey.

4.5.13 Other Species

Rabbit *Oryctolagus cuniculus* activity and sightings were recorded throughout the site and fox *Vulpes vulpes* evidence (odour, scat, feeding remains and corpse) was recorded at target notes 19, 29, 30 and 37.

5 Evaluation and Recommendations

5.1 Designated Sites

The Severn Estuary, designated as SAC, SPA, Ramsar site and SSSI, and the Avon Gorge Woodland SAC are of **International** value for nature conservation. At its nearest point to the site the Severn Estuary site is within 1km and the Avon Gorge Woodlands are approximately 3km east. It is recommended that a Habitats Regulations Assessment screening assessment is undertaken to ascertain whether an Appropriate Assessment is required for the proposed scheme.

Five non-statutory Wildlife Sites are located adjacent to the site. These sites are of **County** value for nature conservation. It is considered that without mitigation, construction may negatively impact these sites and be in breach of planning policy ECH 12. During the operation phase it is considered that habitat connectivity for species of fauna may be impacted.

It is recommended that impacts on these adjacent designated sites during construction are avoided by employing good construction practices to avoid direct disturbance and prevent potential impacts from dust, silt, oils and other potential pollutants. This is likely to include, dust suppression measures, site run-off disposed of in accordance with appropriate legal requirements and appropriately sited, bunded and protected fuel or chemical storage areas. The construction footprint, including access routes, storage areas and site compounds should not impinge upon designated sites. Suitable connectivity for wildlife under and over the railway should be provided, such as providing mammal ledges in culverts beneath the railway and connectivity of hedgerows and linear woodlands linked to bridges.

Other designated sites are located more distant from the site and, therefore, it is considered highly unlikely that the proposals will impact these during construction or operation.

5.2 Habitats

5.2.1 Scrub, Woodland and Trees

The near continuous scrub on the site is considered to be of **Local** value for nature conservation due to the value in connecting habitats, providing shelter and foraging opportunities for animals, and nesting opportunities for birds.

The woodland habitats on the site are an integral part of the green corridor habitat of the site, providing connectivity functions as well as providing shelter and foraging opportunities for animals including bats, and nesting opportunities for birds. These habitats are considered to be of **Local** value for nature conservation.

Mature trees are important habitats in themselves and are only replaceable in the long-term. The adjacent landscape is relatively flat and open and the mature trees on this site are considered to be of up to **District** value for nature conservation.

It is recommended that continuous belts of scrub or linear woodland to either side of the tracks are maintained, where possible, to retain the habitat on site and to preserve connectivity of the green corridor. It is also recommended that mature trees are retained where possible.

5.2.2 Grassland and Tall Ruderals

Grasslands and tall ruderal stands within the site boundary were not species-rich and are considered to be of value for the structural diversity they introduce to habitats and for foraging opportunities for animals. However these habitats are relatively small in extent and, therefore, are considered to be of value within the immediate zone of influence only.

It is recommended that where grasslands are retained or created within the scheme that these are enhanced to develop species-rich swards using locally sourced seeds or plants. For optimal structural diversity for the benefit of invertebrates, it is recommended that grassland/tall ruderal/scrub interfaces are maintained around the site perimeter.

5.2.3 Reedbed and Wetlands

Reed, sedge and rush habitats within the site are small in extent and species-poor habitat considered to be of low quality. These habitats are frequent in the surrounding landscape where the habitat quality is greater. Therefore, the reedbed and wetland habitats within the site are considered to be of value within the immediate zone of influence only.

5.2.4 Watercourses and Ponds

The site passes through a landscape of floodplain and coastal grazing marsh, and as such the watercourses and ponds within and adjacent to the site form part of a network of aquatic habitat. Although the watercourses and ponds within the site boundary are considered to be of low quality, they provide a link between other wetland habitats to the north and south and are considered to be of **Local** value for nature conservation.

It is recommended that these habitats are retained and restored as the drainage system for the railway during construction. It is recommended that any risk of impacts on ponds and watercourses are minimised by employing good construction management practices and implementation of the relevant codes of practice for construction sites. Water pollution prevention measures should be adhered to as set out in the Environment Agency's Pollution Prevention Guidelines (PPG 5: Works and maintenance in or near water).

5.2.5 Structures

Brick bridges and buildings within and adjacent to the site have potential to support breeding, roosting and hibernating fauna such as bats. These structures are considered to be of up to **Local** value for nature conservation.

It is recommended that any works to these structures are undertaken using sensitive methods (informed by bat and breeding bird surveys) and that enhancement of the structures for wildlife are made, where practicable, such as providing nesting or roosting opportunities.

5.3 Species

5.3.1 Amphibians

Amphibians are partially protected by the Wildlife and Countryside Act, 1981 (as amended). Great crested newts are fully protected by the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010.

Two waterbodies with potential for great crested newt are located within the site boundary:

- Small pond at target note 46. Habitat suitability index (HSI) suggests that the pond is below average for great crested newt; and
- Small pond/ditch at target note 47. HSI suggests that the waterbody is average suitability for great crested newt.

Four waterbodies with potential to support great crested newt were observed outside the site during this survey:

- Large pond at target note 17. HSI results indicate excellent habitat for great crested newt;
- Wet ditch south of the railway near target note 17. HSI results indicate below average habitat for great crested newt;
- Pond in field at target note 53. HSI results indicate good habitat for great crested newt; and
- Pond within Field east of M5 motorway, Lodway WS at target note 68. HSI results suggest below average habitat for great crested newt due to the large size of the pond (approximately 0.3ha).

The desk study has also indicated that a further six ponds or waterbodies are located within 250m of the site boundary with no major barriers to movement at:

- A ditch east of Elm Tree Farm;
- Two ponds within a reed bed either side of The Drove;
- A second pond within the Field east of M5 motorway, Lodway WS, northwest from Target Note 68; and
- Two small ponds in fields south of the railway and west of Lodway Farm.

It is recommended that a habitat suitability assessment for great crested newts is undertaken for each of the ponds that have not been assessed as part of the Phase 1 survey.

Although three ponds have below average HSI scores this does not mean that great crested newt are not present. It is recommended that a great crested newt survey is undertaken for all six ponds observed during the survey and any of the other ponds that have potential to support this species. Surveys involve a minimum of four survey visits to be undertaken between mid-March and mid-June.

5.3.2 Badgers

Badgers and their setts are protected under the Protection of Badgers Act 1992.

Badgers have been found to be resident on the site and locations of other setts are possible within dense vegetation. It is considered that the badger population on the site is up to **Local** value for nature conservation.

It is recommended that the sett at target note 9 is retained if possible. It is not possible to confirm presence of other setts without clearance of vegetation using machinery or power tools. It is recommended that clearance of the site is undertaken in association with a watching brief by an experienced ecologist. A mitigation strategy will be required for any setts that fall within approximately 30m of construction or areas to be accessed by heavy machinery. Should any setts need to be closed this must be carried out under licence from Natural England. A two month period should be allowed for the licence application process.

5.3.3 Bats

All bat species and their places of refuge are fully protected under European and UK legislation under Schedule 2 of the Conservation and Habitats Regulations (2010) and Schedule 5 of the Wildlife and Countryside Act (WCA) 1981 (as amended).

The mature trees and structures within and adjacent to the site have potential to support roosting bats. The railway corridor is a linear feature that has potential to be important for bat foraging and commuting. Therefore, to support a planning application it will be necessary for bat surveys to be undertaken (using licensed bat workers where required) to establish if and how bats are using the site, determine locations of roosts and identify species and population sizes. Bat activity surveys must be undertaken when bats are active, between May and August. Roost inspections can be undertaken during the hibernation period or the active period. All surveys should be undertaken in accordance with *Bat Surveys, Good Practice Guidelines* (Bat Conservation Trust, 2007).

5.3.4 Birds

All breeding birds, whilst actively nesting, are protected in the UK under the Wildlife and Countryside Act 1981 (as amended).

The site supports features (scrub, woodland, mature trees and grassland), which are likely to be used by breeding birds and could support significant species, populations or assemblages. It is therefore recommended that a breeding bird survey is undertaken (mid-March to mid-June) to assess the importance of the site for breeding birds. Further, it is recommended, subject to the findings of the breeding bird survey, that site clearance is undertaken between September and February, which is outside the bird nesting season.

5.3.5 Invertebrates

The site supports features (mature trees and grassland, tall ruderal and scrub interfaces) that may be of importance for invertebrate species or assemblages. It is recommended that a terrestrial invertebrate survey (likely to comprise at least four survey visits between May and September) is undertaken at to assess the importance of the site for these species.

5.3.6 Reptiles

Common reptiles receive a limited degree of protection in the UK under the Wildlife and Countryside Act 1981 (as amended). Reptiles likely to use the site (e.g. grass snake and slow worm) are protected against killing, injury and sale.

Potentially suitable habitats for reptiles are present within the site within grassland, tall herb and scrub mosaics and transitions. Potential basking areas and also wetland foraging areas (for grass snakes) are present at target notes 1, 2, 5, 10, 11, 13, 28, 35 and 72. Potential reptile hibernacula in deadwood habitats in the railway line are also present, e.g. at target note 18.

In conjunction with grasslands beyond the site, much of the site has potential to support reptiles. It is therefore recommended that a reptile survey is undertaken in April-May or September, to inform a reptile mitigation strategy to prevent killing or injury to reptiles during construction.

5.3.7 Water Shrew

Water shrew receives limited protection in the UK under the Wildlife and Countryside Act 1981 (as amended). Accordingly, this species cannot be intentionally trapped without a licence.

The low quality habitat of waterbodies on the site indicates that water shrew is highly unlikely to be present within the site. However, water shrew may be present in waterbodies beyond the site. Therefore, it is recommended that water shrew are considered during surveys for great crested newt, and that bottle-trapping is not used where water shrews are considered likely to be present.

5.3.8 Water Vole

Water voles and their places of shelter or protection receive full protection under the provisions of Section 9 of the Wildlife and Countryside Act 1981 (as amended).

The large drain at the western end of the site (target note 5) and the pond at target note 47 have potential to support this species. It is recommended that a water vole survey is undertaken in both locations (ideally the survey should be undertaken prior to June when vegetation growth may obscure sight-lines). This survey should be used to inform water vole mitigation during construction (if necessary) and enhancements for this species during operation.

5.3.9 Other Notable Species

The existing wildlife corridor function of the disused railway line is likely to provide habitat opportunities for hedgehog but of less relevance to brown hare, which live in open habitats. It is therefore recommended that the green corridor function of the site is maintained following construction, where possible, to maintain connectivity of habitats.

5.4 Conclusion

In conclusion, it is considered that subject to the implementation of the recommended measures set out above in relation to avoiding or mitigating for potential impacts to SSSIs and subject to recommendations of detailed species surveys, that the proposed

development of the site could be implemented without significant adverse ecological impacts and be in accordance with relevant legislation and planning policy.

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Appendices




Appendix A Target Notes and Photographs




Target Note	Description	Photograph
1	Construction site with reptile exclusion fencing.	
2	Semi-improved grassland. Has not been managed in previous growing season. Species include cock's-foot, common bent, ribwort plantain, teasel, broadleaved dock, vetch, white clover and creeping cinquefoil. Patches of bare ground are present and bramble is starting to develop within sward. Reptile potential.	
3	Hard rush developing in area of poor drainage.	



Target Note	Description	Photograph
4	Mammal path under fence.	
5	Large drain. Lower banks are piled in places and lined with concrete or brick, however soft bank is present. Some water vole potential although no emergent vegetation. Linear feature with potential for bat commuting and foraging.	
6	Concrete road bridge over drain (Den Dungen Bridge). Newly pointed abutments. Low bat potential.	




Target Note	Description	Photograph
7	Brick railway bridge over drain. Brickwork may offer bat roost potential.	
8	Ivy-clad trees may have bat potential.	
9	Active badger sett. Five visible entrances. Bedding strewn outside the entrances. Scrub could not be cleared to access without unreasonable attention being drawn to the presence of the sett.	




Target Note	Description	Photograph
10	Mosaic of scrub and grass paths with broad tall ruderal transitions. Some rubble. Good reptile and invertebrate potential.	
11	Sheltered area of tall ruderal dominated by common nettle between scrub. Potential for invertebrates and reptiles. Brimstone, small tortoiseshell and rabbit present.	
12	Hole in ground but no mammal trampling and not characteristic shape for badger holes. Could be residual from excavation of concrete from the ground.	




Target Note	Description	Photograph
13	Sheltered west facing bank of grass and scrub. Potential for invertebrates and reptiles. Painted lady seen nearby.	
14	Ivy-clad willow. Possible bat potential.	
15	Drain with two-stage concrete channel. Not suitable for water vole.	




Target Note	Description	Photograph
16	Dense bramble scrub with a high level of starling activity e.g. singing and calling.	
17	Pond with great crested newt potential.	
18	Dead wood with reptile hibernacula potential.	None.
19	Strong fox smell. Mammal (possibly rabbit) tunnel through bramble.	




Target Note	Description	Photograph
20	Ash with bat roost potential.	
21	Tree with bat roost potential.	None.
22	Tree with bat roost potential.	None.
23	Tree with bat roost potential and dead wood stumps.	None.
24	Ivy-clad mature trees with bat potential.	
25	Mammal trail parallel to fence. Possibly rabbit. Frequent rabbit scrapes.	None.




Target Note	Description	Photograph
26	Voids in brickwork of road bridge arch and west elevation. Bat potential.	
27	Engineering gaps in eastern elevation of Sheepway Lane bridge. Bat potential.	
28	Open grassy area on south side of tracks. Reptile basking potential.	




Target Note	Description	Photograph
29	Fox scat on tracks.	
30	Dead fox.	None.
31	Dense bramble except an oak surrounded by grass.	
32	Mature ash trees developed from a layered hedge. Rot holes and ivy-cladding. Bat potential.	




Target Note	Description	Photograph
33	Bird boxes and bat boxes mounted on trees at the end of a garden.	
34	Mammal hole with bedding and a clear mammal trail. No evidence of badger. Rabbit signs around.	
35	Open grassy area on south side of tracks with reptile potential. Lots of signs of mammal foraging and rabbits.	
36	Holes and spoil heaps visible beneath dense hawthorn. Possible badger sett but could not access to search for species signs.	None.




Target Note	Description	Photograph
37	Fresh excavations with two holes. One spoil heap has rabbit fur among dried grass (possible bedding) and fox scat. Probable fox den with two entrances.	
38	Stream. Sub-optimal for water vole. Shallow and little bankside vegetation. Passes beneath railway in a low brick culvert.	
39	Copse of mature poplar. Low bat potential.	
40	Fishing pond. Not suitable for great crested newts.	None.
41	Dry pond (bare earth depression).	None.
42	Rabbit sighting.	None.



Target Note	Description	Photograph
43	Trees with bat roost potential.	
44	Modern brick shed. Low potential for bats.	None.
45	Woodland not accessed due to vagrant camp.	
46	Small standing water feature covered with duckweed and fool's watercress emergent on north bank.	




Target Note	Description	Photograph
47	Drain with standing water covered with duckweed. Fringed by common reed and overhung by goat willow.	
48	Derelict building with no roof. Ivy-clad structure in centre. Bat roost potential.	
49	Mature silver birch clad in dense ivy. High potential for roosting bats.	




Target Note	Description	Photograph
50	Lesser pond sedge growing at side of path.	
51	Line of mature poplars. Some with ivy cladding and broken boughs. Moderate bat roost potential.	
52	Wet ditch. Shallow and stagnant. Filled with leaves and in heavy shade. On north side of track at this location is a disused mammal hole, possibly a badger sett due to very large spoil heaps in front, with at least three disused entrances now full of leaves, semi-collapsed and covered by bramble.	

Target Note	Description	Photograph
52		
53	Pond with mallard ducks present. Limited marginal vegetation.	
54	Marsh Lane road bridge. Stone and brick with a few gaps in the mortar. Moderate potential for roosting bats.	




Target Note	Description	Photograph
54		 A photograph of a stone arch bridge spanning a narrow path. The bridge is constructed from rough-hewn stone blocks and has a single large arch. The path is paved and leads through some vegetation.
55	Small circular area of standing water. Low potential for great crested newt.	 A photograph showing a dense area of tall, dry grasses and reeds, likely a wetland or marshy area.
56	Small open area of species poor semi-improved grassland including dandelion, ivy, vetch, yarrow, clover and meadow-grass.	 A photograph of a grassy area with some low-lying vegetation and a path leading through it. The area appears to be a semi-improved grassland.




Target Note	Description	Photograph
57	Silver birch tree with ivy. Bat potential.	
58	Oak with ivy covered trunk. Bat potential.	

Target Note	Description	Photograph
59	Oak with ivy covered trunk. Bat potential.	
60	Brick and masonry arch culvert. Voids in north elevation. Bat roost potential. Standing water in culvert. Water parsnip and creeping buttercup present.	
61	Group of ivy-clad trees with bat potential.	

Target Note	Description	Photograph
62	Group of ivy-clad trees with bat potential. Large stag-headed oak with potential for bats and invertebrates.	
63	Motorway bridge. Concrete. Few opportunities for bats.	
64	Mature line of hawthorn covered in ivy.	

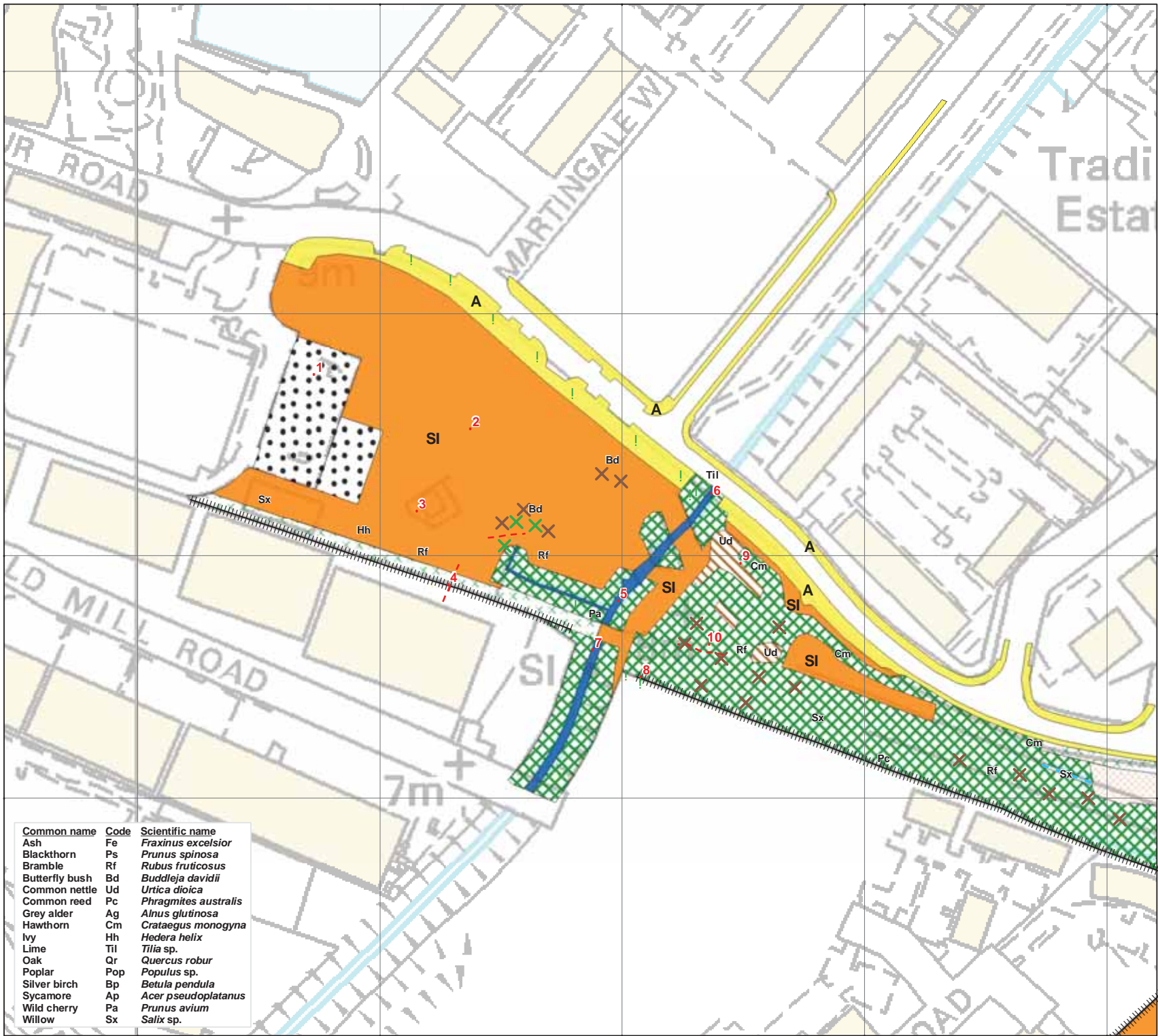
Target Note	Description	Photograph
65	Dry pond surrounded by willowherb.	
66	Oak with ivy. Low bat potential.	

Target Note	Description	Photograph
67	Gnarled oak. Low bat potential.	
68	Extensive common reed and bulrush with open water in the centre. Coots present.	
69	Mature line of hawthorn covered in ivy. Honeysuckle also present.	

Target Note	Description	Photograph
70	Gnarled oak with ivy. Low bat potential.	
71	Very prominent mammal path up embankment.	
72	Grassy area on railway line. Abundant moss with ox-eye daisy and vetches. Reptile potential.	

Target Note	Description	Photograph
73	Line of young hawthorn and privet.	

Appendix B Figures 1 and 2



Legend

- Target note
- Individual broadleaved tree
- Ps Dominant species
- Scattered scrub
- Scattered introduced shrub
- Running water
- Intact hedge - species-poor
- Fence
- Dry ditch
- Mammal trail
- Broadleaved woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- SI Neutral grassland - semi-improved
- Other tall herb and fern - ruderal
- Swamp
- Standing water
- Running water
- A Cultivated/disturbed land - arable
- A Cultivated/disturbed land - amenity grassland
- Introduced shrub
- Building
- Bare ground

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Project : **Portishead Railway**

Drawing : **Phase 1 Habitat Map Sheet 1**

Drawn By : RA	Date : April 2011
Checked By : SET	Date : April 2011
Approved By : DGW	Date : April 2011

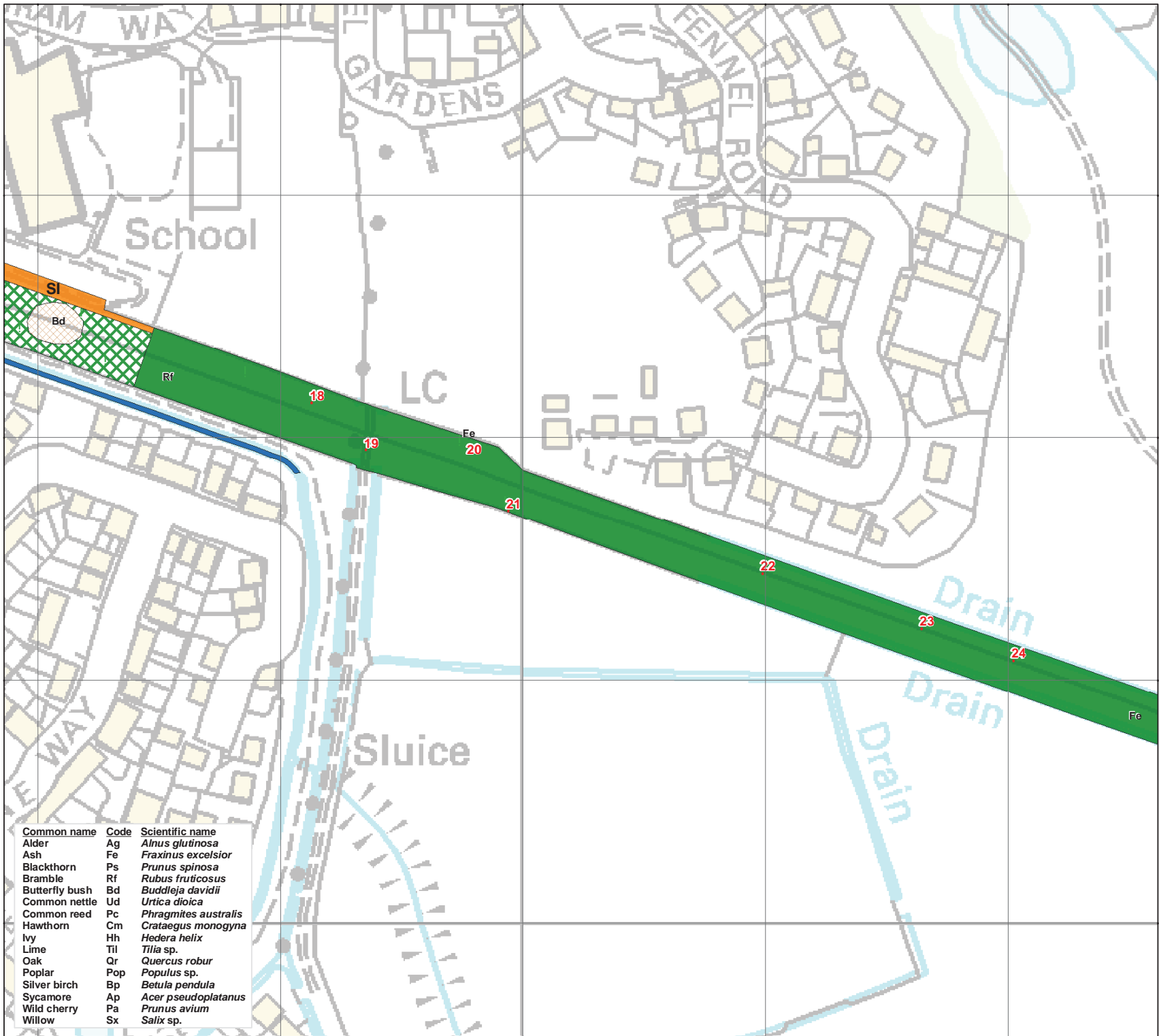
Drawing Number: **Figure 2**

Drawing Scale: 1:1,500 Plot Scale: 1:1 @ A3

Metres

0 25 50 100

Common name	Code	Scientific name
Ash	Fe	<i>Fraxinus excelsior</i>
Blackthorn	Ps	<i>Prunus spinosa</i>
Bramble	Rf	<i>Rubus fruticosus</i>
Butterfly bush	Bd	<i>Buddleja davidii</i>
Common nettle	Ud	<i>Urtica dioica</i>
Common reed	Pc	<i>Phragmites australis</i>
Grey alder	Ag	<i>Alnus glutinosa</i>
Hawthorn	Cm	<i>Crataegus monogyna</i>
Ivy	Hh	<i>Hedera helix</i>
Lime	Til	<i>Tilia sp.</i>
Oak	Qr	<i>Quercus robur</i>
Poplar	Pop	<i>Populus sp.</i>
Silver birch	Bp	<i>Betula pendula</i>
Sycamore	Ap	<i>Acer pseudoplatanus</i>
Wild cherry	Pa	<i>Prunus avium</i>
Willow	Sx	<i>Salix sp.</i>



Legend

- Target note
- Individual broadleaved tree
- Ps Dominant species
- X Scattered scrub
- X Scattered introduced shrub
- Running water
- Intact hedge - species-poor
- Fence
- Dry ditch
- Mammal trail
- Broadleaved woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- SI Neutral grassland - semi-improved
- Other tall herb and fern - ruderal
- Swamp
- Standing water
- Running water
- A Cultivated/disturbed land - arable
- A Cultivated/disturbed land - amenity grassland
- Introduced shrub
- Building
- Bare ground

Common name	Code	Scientific name
Alder	Ag	<i>Alnus glutinosa</i>
Ash	Fe	<i>Fraxinus excelsior</i>
Blackthorn	Ps	<i>Prunus spinosa</i>
Bramble	Rf	<i>Rubus fruticosus</i>
Butterfly bush	Bd	<i>Buddleja davidii</i>
Common nettle	Ud	<i>Urtica dioica</i>
Common reed	Pc	<i>Phragmites australis</i>
Hawthorn	Cm	<i>Crataegus monogyna</i>
Ivy	Hh	<i>Hedera helix</i>
Lime	Til	<i>Tilia</i> sp.
Oak	Qr	<i>Quercus robur</i>
Poplar	Pop	<i>Populus</i> sp.
Silver birch	Bp	<i>Betula pendula</i>
Sycamore	Ap	<i>Acer pseudoplatanus</i>
Wild cherry	Pa	<i>Prunus avium</i>
Willow	Sx	<i>Salix</i> sp.

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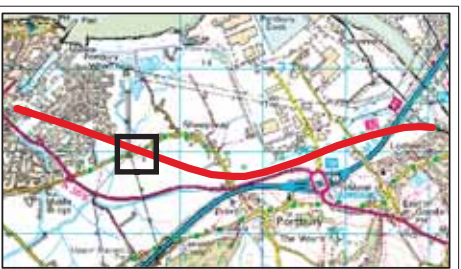
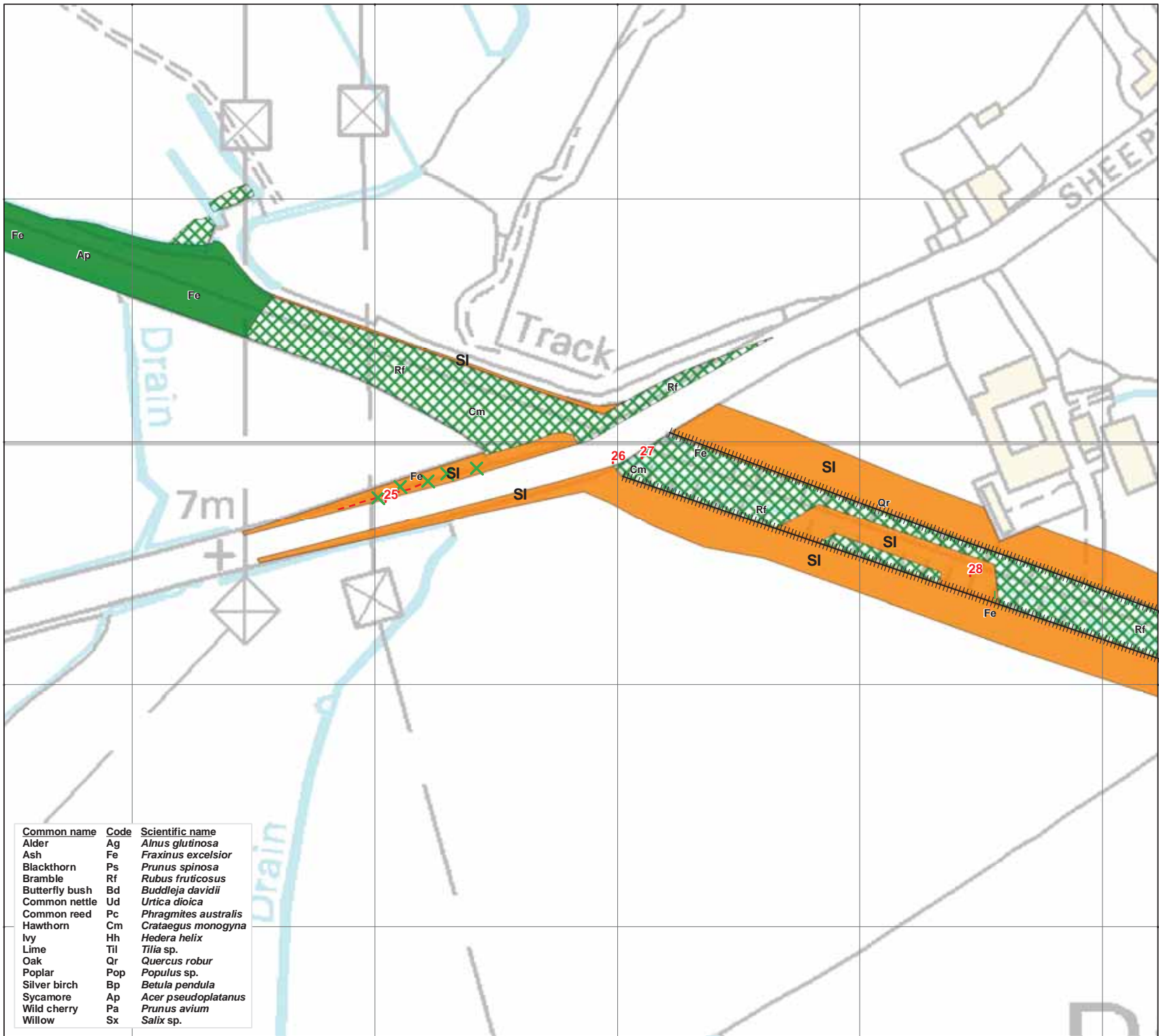
Project :
Portishead Railway

Drawing :
**Phase 1 Habitat Map
Sheet 3**

Drawn By : RA Date : April 2011
Checked By : SET Date : April 2011
Approved By : DGW Date : April 2011

Drawing Number:
Figure 2

Drawing Scale: 1:1,500 Plot Scale: 1:1 @ A3



Legend

- Target note
- Individual broadleaved tree
- Dominant species
- Scattered scrub
- Scattered introduced shrub
- Running water
- Intact hedge - species-poor
- Fence
- Dry ditch
- Mammal trail
- Broadleaved woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Neutral grassland - semi-improved
- Other tall herb and fern - ruderal
- Swamp
- Standing water
- Running water
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Introduced shrub
- Building
- Bare ground

Common name	Code	Scientific name
Alder	Ag	<i>Alnus glutinosa</i>
Ash	Fe	<i>Fraxinus excelsior</i>
Blackthorn	Ps	<i>Prunus spinosa</i>
Bramble	Rf	<i>Rubus fruticosus</i>
Butterfly bush	Bd	<i>Buddleja davidii</i>
Common nettle	Ud	<i>Urtica dioica</i>
Common reed	Pc	<i>Phragmites australis</i>
Hawthorn	Cm	<i>Crataegus monogyna</i>
Ivy	Hh	<i>Hedera helix</i>
Lime	Til	<i>Tilia</i> sp.
Oak	Qr	<i>Quercus robur</i>
Poplar	Pop	<i>Populus</i> sp.
Silver birch	Bp	<i>Betula pendula</i>
Sycamore	Ap	<i>Acer pseudoplatanus</i>
Wild cherry	Pa	<i>Prunus avium</i>
Willow	Sx	<i>Salix</i> sp.

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Drawing :
**Phase 1 Habitat Map
Sheet 4**

Drawn By : RA

Date : April 2011

Checked By : SET

Date : April 2011

Approved By : DGW

Date : April 2011

Drawing Number:
Figure 2

Drawing Scale: 1:1,500

Plot Scale: 1:1 @ A3

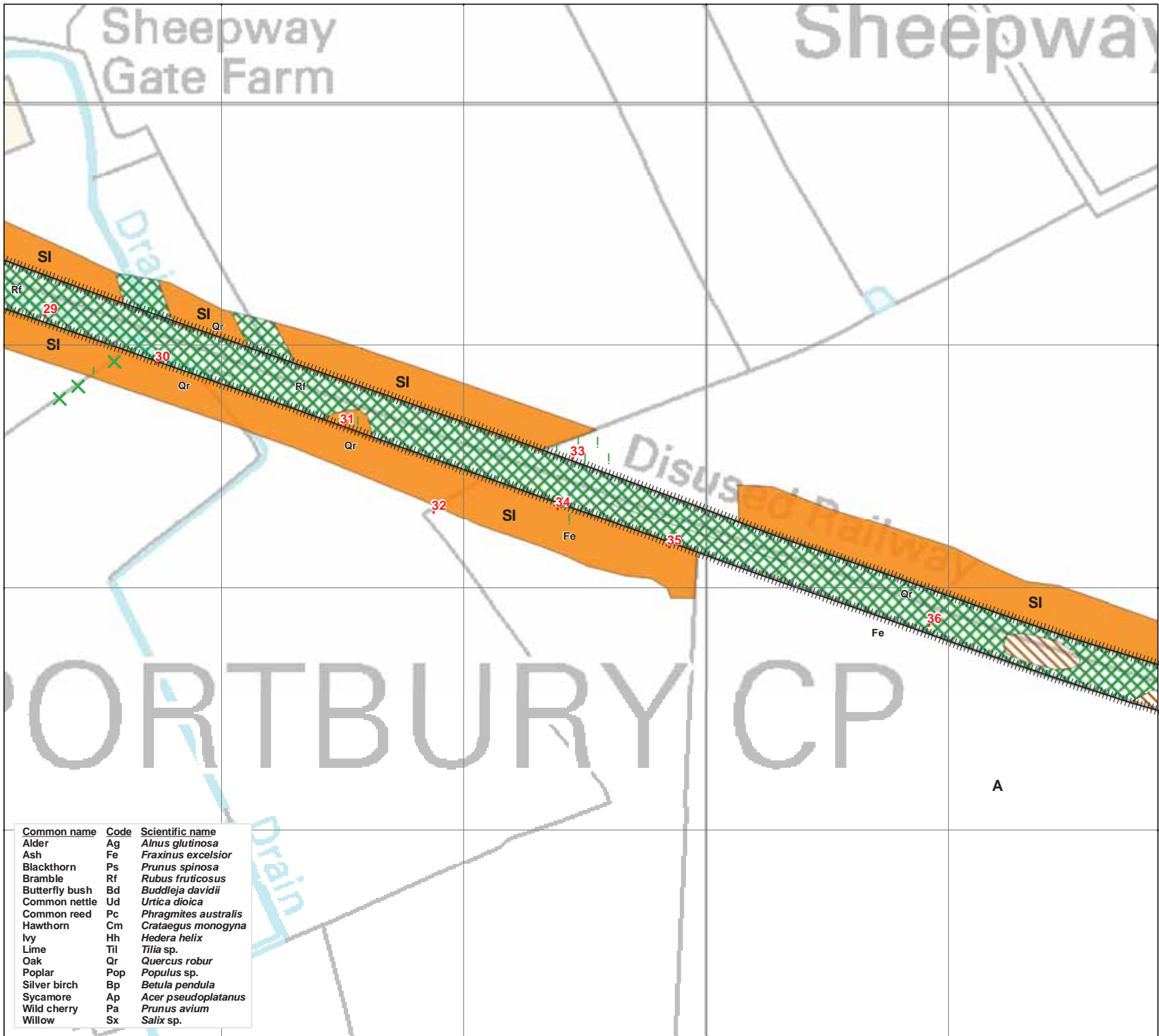
0

25

50

100

Metres



Legend

- Target note
- Individual broadleaved tree
- Dominant species
- Scattered scrub
- Scattered introduced shrub
- Running water
- Intact hedge - species-poor
- Fence
- Dry ditch
- Mammal trail
- Broadleaved woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Neutral grassland - semi-improved
- Other tall herb and fern - ruderal
- Swamp
- Standing water
- Running water
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Introduced shrub
- Building
- Bare ground

Common name	Code	Scientific name
Alder	Ag	<i>Alnus glutinosa</i>
Ash	Fe	<i>Fraxinus excelsior</i>
Blackthorn	Ps	<i>Prunus spinosa</i>
Bramble	Rf	<i>Rubus fruticosus</i>
Butterfly bush	Bd	<i>Buddleja davidii</i>
Common nettle	Ud	<i>Urtica dioica</i>
Common reed	Pc	<i>Phragmites australis</i>
Hawthorn	Cm	<i>Crataegus monogyna</i>
Ivy	Hh	<i>Hedera helix</i>
Lime	Til	<i>Tilia</i> sp.
Oak	Qr	<i>Quercus robur</i>
Poplar	Pop	<i>Populus</i> sp.
Silver birch	Bp	<i>Betula pendula</i>
Sycamore	Ap	<i>Acer pseudoplatanus</i>
Wild cherry	Pa	<i>Prunus avium</i>
Willow	Sx	<i>Salix</i> sp.

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Project : **Portishead Railway**

Drawing : **Phase 1 Habitat Map Sheet 5**

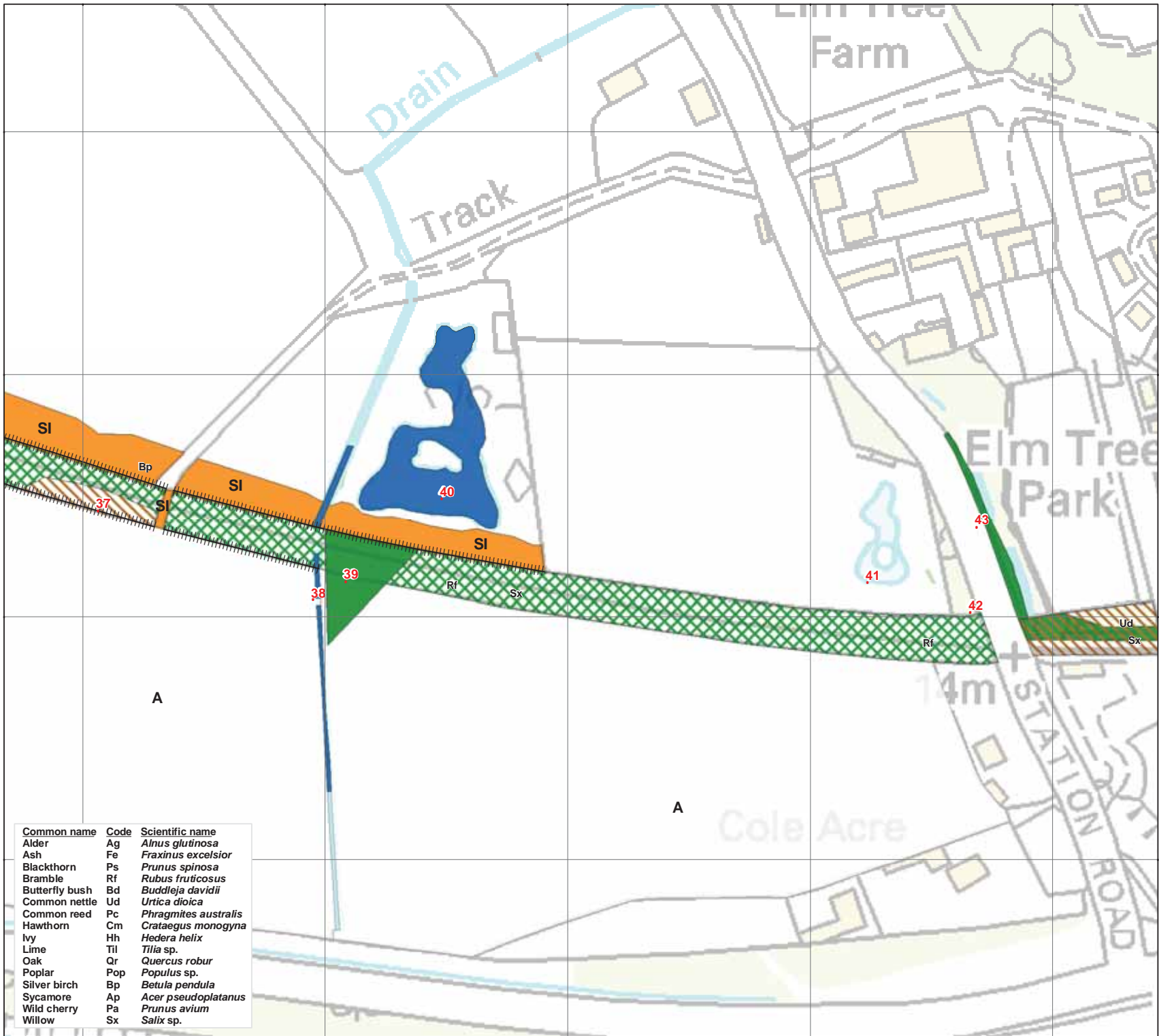
Drawn By : RA	Date : April 2011
Checked By : SET	Date : April 2011
Approved By : DGW	Date : April 2011

Drawing Number: **Figure 2**

Drawing Scale: 1:1,500 Plot Scale: 1:1 @ A3

Metres

0 25 50 100



Legend

- Target note
- Individual broadleaved tree
- Ps Dominant species
- Scattered scrub
- Scattered introduced shrub
- Running water
- Intact hedge - species-poor
- Fence
- Dry ditch
- Mammal trail
- Broadleaved woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- SI Neutral grassland - semi-improved
- Other tall herb and fern - ruderal
- Swamp
- Standing water
- Running water
- A Cultivated/disturbed land - arable
- A Cultivated/disturbed land - amenity grassland
- Introduced shrub
- Building
- Bare ground

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Drawing : Phase 1 Habitat Map Sheet 6

Drawn By : RA Date : April 2011
Checked By : SET Date : April 2011
Approved By : DGW Date : April 2011

Drawing Number: Figure 2

Drawing Scale: 1:1,500 Plot Scale: 1:1 @ A3



Common name	Code	Scientific name
Alder	Ag	<i>Alnus glutinosa</i>
Ash	Fe	<i>Fraxinus excelsior</i>
Blackthorn	Ps	<i>Prunus spinosa</i>
Bramble	Rf	<i>Rubus fruticosus</i>
Butterfly bush	Bd	<i>Buddleja davidii</i>
Common nettle	Ud	<i>Urtica dioica</i>
Common reed	Pc	<i>Phragmites australis</i>
Hawthorn	Cm	<i>Crataegus monogyna</i>
Ivy	Hh	<i>Hedera helix</i>
Lime	Til	<i>Tilia sp.</i>
Oak	Qr	<i>Quercus robur</i>
Poplar	Pop	<i>Populus sp.</i>
Silver birch	Bp	<i>Betula pendula</i>
Sycamore	Ap	<i>Acer pseudoplatanus</i>
Wild cherry	Pa	<i>Prunus avium</i>
Willow	Sx	<i>Salix sp.</i>



Legend

- | | |
|------------------|-----------------------------------------------|
| . | Target note |
| ! | Individual broadleaved tree |
| Ps | Dominant species |
| X | Scattered scrub |
| X | Scattered introduced shrub |
| Blue arrows | Running water |
| Green line | Intact hedge - species-poor |
| | Fence |
| - - - | Dry ditch |
| - - - | Mammal trail |
| Green box | Broadleaved woodland - semi-natural |
| Green X box | Scrub - dense/continuous |
| Green dotted box | Scrub - scattered |
| Orange box SI | Neutral grassland - semi-improved |
| Orange box | Other tall herb and fern - ruderal |
| Light blue box | Swamp |
| Dark blue box | Standing water |
| Dark blue box | Running water |
| White box A | Cultivated/disturbed land - arable |
| Yellow box A | Cultivated/disturbed land - amenity grassland |
| Orange X box | Introduced shrub |
| Black box | Building |
| White box | Bare ground |

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Project :	Portishead Railway
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Drawing : Phase 1 Habitat Map
Sheet 7

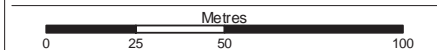
Drawn By :	RA	Date :	April 2011
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Checked By : SET	Date : April 2011
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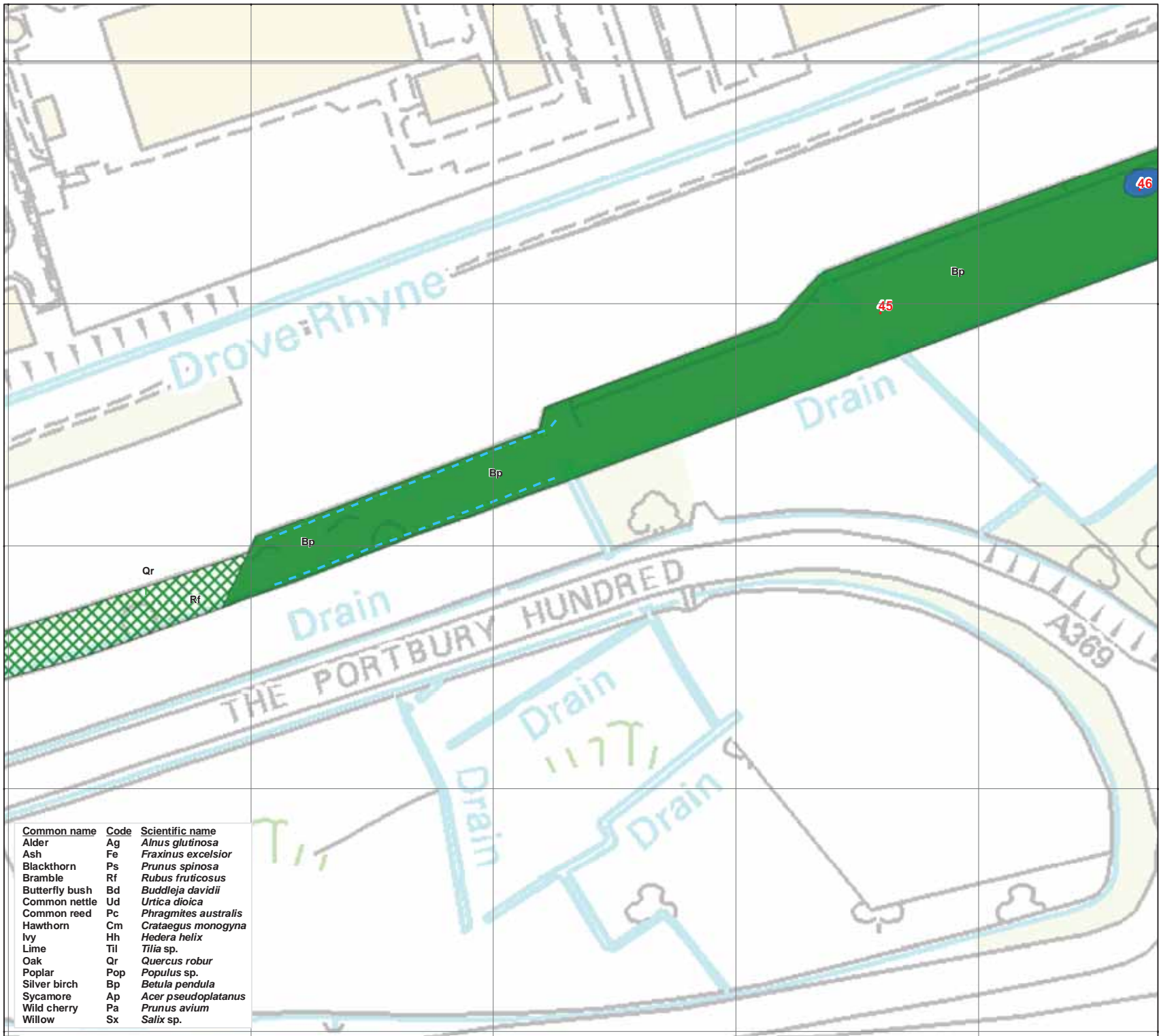
Approved By : DGW	Date : April 2011
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Drawing Number: **Figure 2**

Drawing Scale: 1:1,500 Plot Scale : 1:1 @ A3



Common name	Code	Scientific name
Alder	Ag	<i>Alnus glutinosa</i>
Ash	Fe	<i>Fraxinus excelsior</i>
Blackthorn	Ps	<i>Prunus spinosa</i>
Bramble	Rf	<i>Rubus fruticosus</i>
Butterfly bush	Bd	<i>Buddleja davidii</i>
Common nettle	Ud	<i>Urtica dioica</i>
Common reed	Pc	<i>Phragmites australis</i>
Hawthorn	Cm	<i>Crataegus monogyna</i>
Ivy	Hh	<i>Hedera helix</i>
Lime	Til	<i>Tilia</i> sp.
Oak	Qr	<i>Quercus robur</i>
Poplar	Pop	<i>Populus</i> sp.
Silver birch	Bp	<i>Betula pendula</i>
Sycamore	Ap	<i>Acer pseudoplatanus</i>
Wild cherry	Pa	<i>Prunus avium</i>
Willow	Sx	<i>Salix</i> sp.



Legend

- Target note
- Individual broadleaved tree
- Dominant species
- Scattered scrub
- Scattered introduced shrub
- Running water
- Intact hedge - species-poor
- Fence
- Dry ditch
- Mammal trail
- Broadleaved woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Neutral grassland - semi-improved
- Other tall herb and fern - ruderal
- Swamp
- Standing water
- Running water
- Cultivated/disturbed land - arable
- Cultivated/disturbed land - amenity grassland
- Introduced shrub
- Building
- Bare ground

Common name	Code	Scientific name
Alder	Ag	<i>Alnus glutinosa</i>
Ash	Fe	<i>Fraxinus excelsior</i>
Blackthorn	Ps	<i>Prunus spinosa</i>
Bramble	Rf	<i>Rubus fruticosus</i>
Butterfly bush	Bd	<i>Buddleja davidii</i>
Common nettle	Ud	<i>Urtica dioica</i>
Common reed	Pc	<i>Phragmites australis</i>
Hawthorn	Cm	<i>Crataegus monogyna</i>
Ivy	Hh	<i>Hedera helix</i>
Lime	Til	<i>Tilia sp.</i>
Oak	Qr	<i>Quercus robur</i>
Poplar	Pop	<i>Populus sp.</i>
Silver birch	Bp	<i>Betula pendula</i>
Sycamore	Ap	<i>Acer pseudoplatanus</i>
Wild cherry	Pa	<i>Prunus avium</i>
Willow	Sx	<i>Salix sp.</i>

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Project : **Portishead Railway**

Drawing : **Phase 1 Habitat Map Sheet 8**

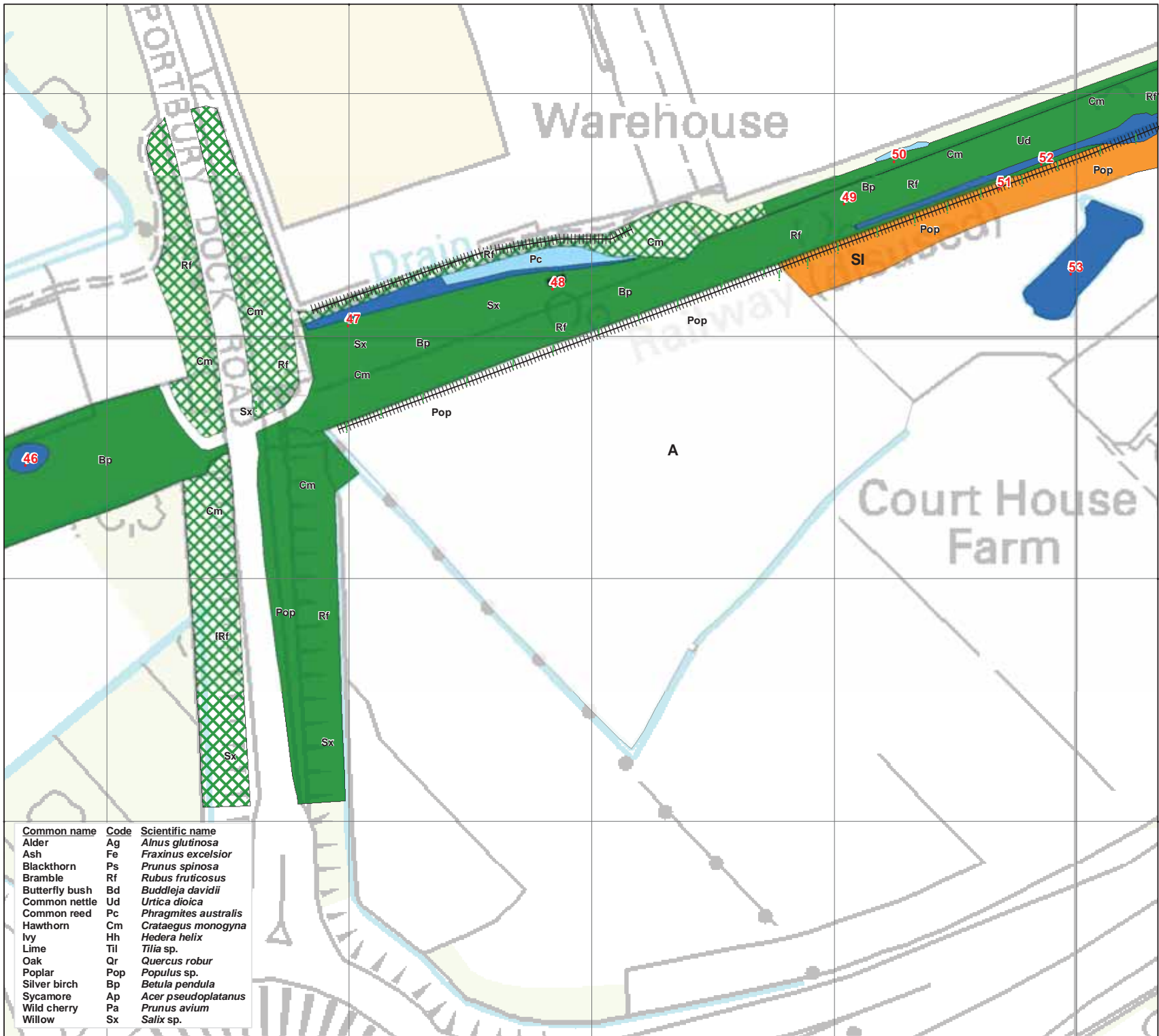
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Checked By : SET	Date : April 2011
Approved By : DGW	Date : April 2011

Drawing Number: **Figure 2**

Drawing Scale: 1:1,500 Plot Scale: 1:1 @ A3

Metres

0 25 50 100



Legend

- Target note
- Individual broadleaved tree
- Dominant species
- Scattered scrub
- Scattered introduced shrub
- Running water
- Intact hedge - species-poor
- Fence
- Dry ditch
- Mammal trail
- Broadleaved woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- SI Neutral grassland - semi-improved
- Other tall herb and fern - ruderal
- Swamp
- Standing water
- Running water
- A Cultivated/disturbed land - arable
- A Cultivated/disturbed land - amenity grassland
- Introduced shrub
- Building
- Bare ground

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Project : Portishead Railway

Drawing : Phase 1 Habitat Map Sheet 9

Drawn By : RA	Date : April 2011
Checked By : SET	Date : April 2011
Approved By : DGW	Date : April 2011

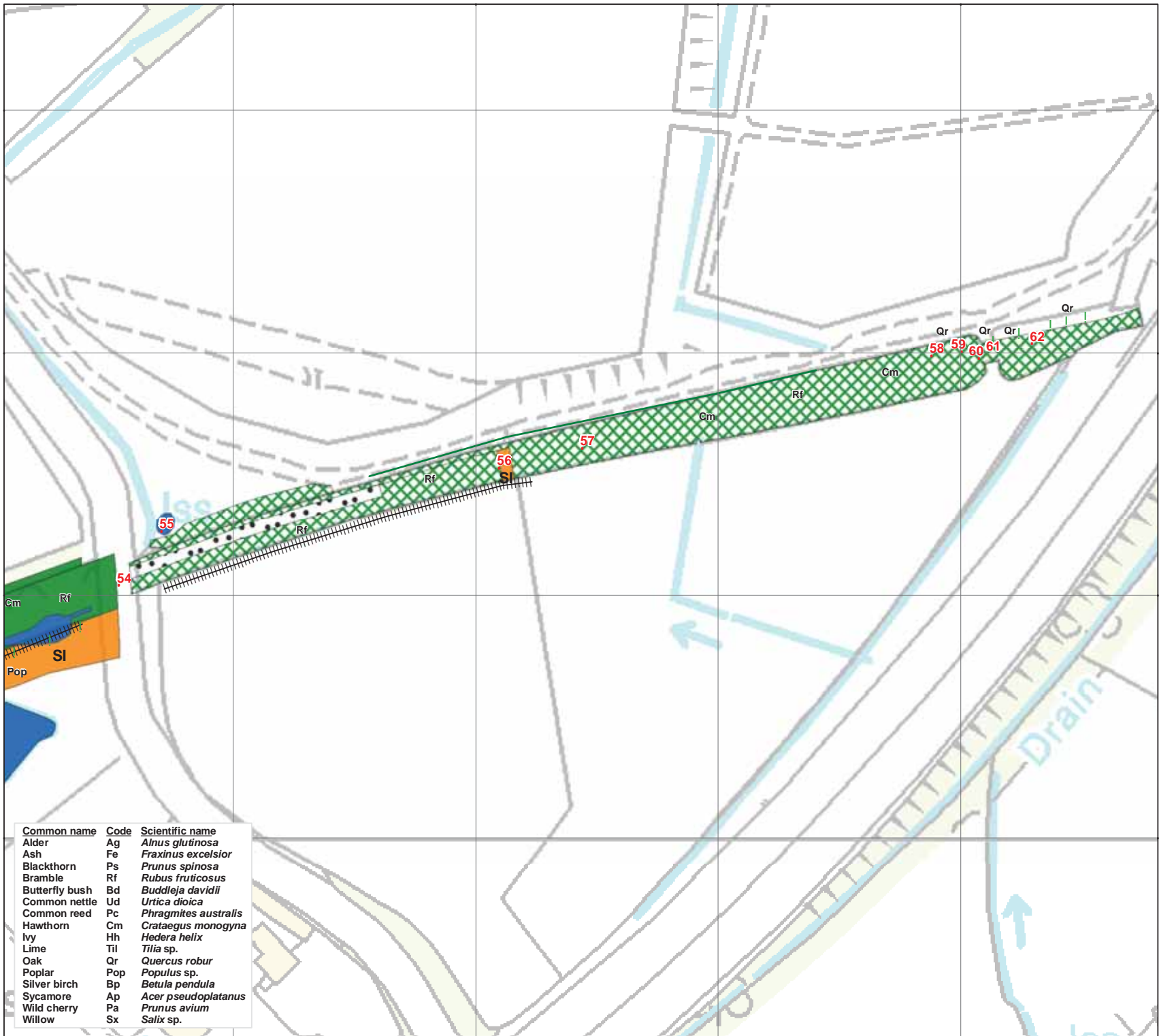
Drawing Number: Figure 2

Drawing Scale: 1:1,500 Plot Scale: 1:1 @ A3

Metres

0 25 50 100

Common name	Code	Scientific name
Alder	Ag	<i>Alnus glutinosa</i>
Ash	Fe	<i>Fraxinus excelsior</i>
Blackthorn	Ps	<i>Prunus spinosa</i>
Bramble	Rf	<i>Rubus fruticosus</i>
Butterfly bush	Bd	<i>Buddleja davidii</i>
Common nettle	Ud	<i>Urtica dioica</i>
Common reed	Pc	<i>Phragmites australis</i>
Hawthorn	Cm	<i>Crataegus monogyna</i>
Ivy	Hh	<i>Hedera helix</i>
Lime	Til	<i>Tilia sp.</i>
Oak	Qr	<i>Quercus robur</i>
Poplar	Pop	<i>Populus sp.</i>
Silver birch	Bp	<i>Betula pendula</i>
Sycamore	Ap	<i>Acer pseudoplatanus</i>
Wild cherry	Pa	<i>Prunus avium</i>
Willow	Sx	<i>Salix sp.</i>



Legend

- Target note
- Individual broadleaved tree
- Ps Dominant species
- Scattered scrub
- Scattered introduced shrub
- Running water
- Intact hedge - species-poor
- Fence
- Dry ditch
- Mammal trail
- Broadleaved woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- SI Neutral grassland - semi-improved
- Other tall herb and fern - ruderal
- Swamp
- Standing water
- Running water
- A Cultivated/disturbed land - arable
- A Cultivated/disturbed land - amenity grassland
- Introduced shrub
- Building
- Bare ground

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Project : **Portishead Railway**

Drawing : **Phase 1 Habitat Map Sheet 10**

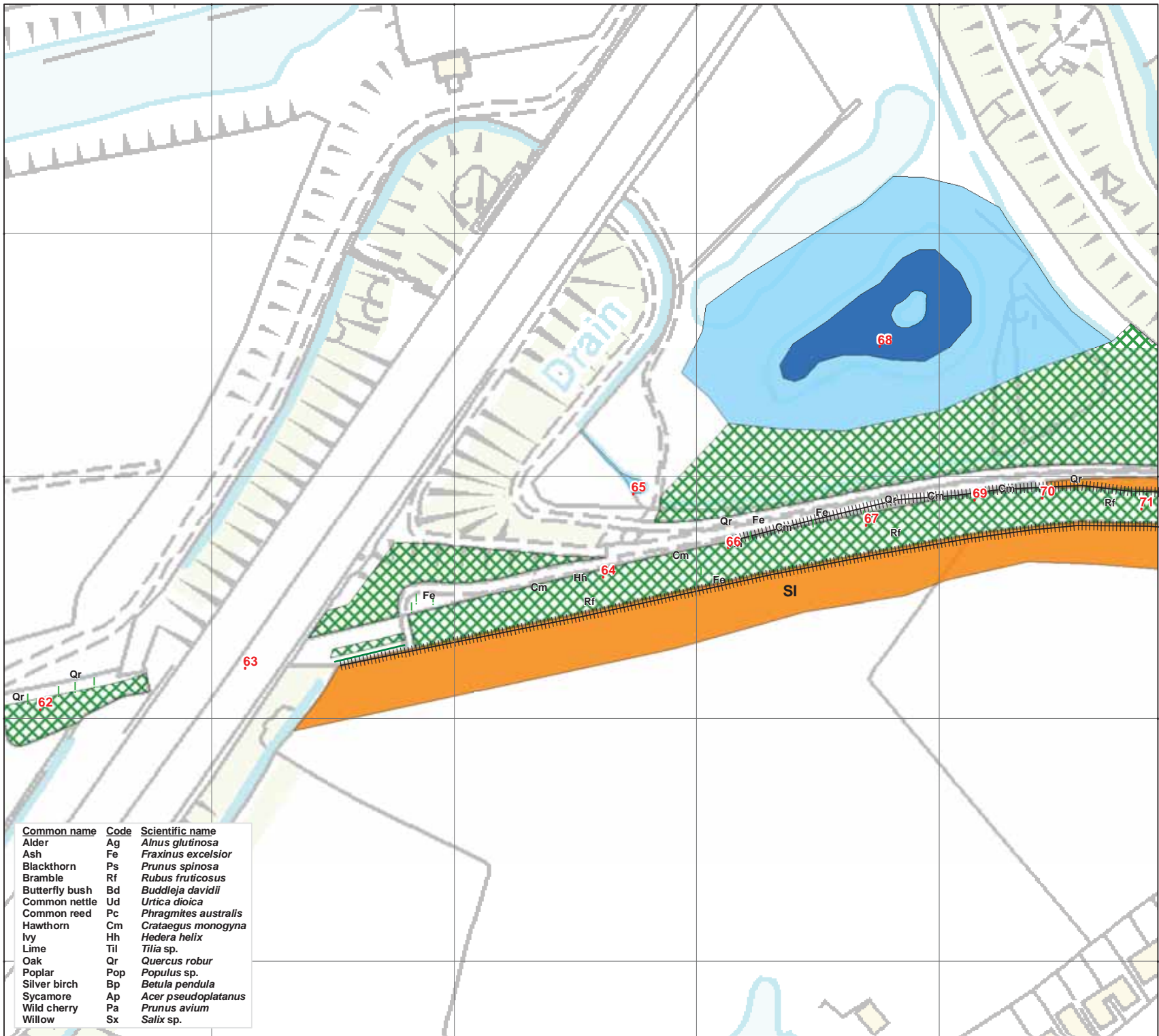
Drawn By : RA	Date : April 2011
Checked By : SET	Date : April 2011
Approved By : DGW	Date : April 2011

Drawing Number: **Figure 2**

Drawing Scale: 1:1,500 Plot Scale: 1:1 @ A3

0 25 50 100 Metres

Common name	Code	Scientific name
Alder	Ag	<i>Alnus glutinosa</i>
Ash	Fe	<i>Fraxinus excelsior</i>
Blackthorn	Ps	<i>Prunus spinosa</i>
Bramble	Rf	<i>Rubus fruticosus</i>
Butterfly bush	Bd	<i>Buddleja davidii</i>
Common nettle	Ud	<i>Urtica dioica</i>
Common reed	Pc	<i>Phragmites australis</i>
Hawthorn	Cm	<i>Crataegus monogyna</i>
Ivy	Hh	<i>Hedera helix</i>
Lime	Til	<i>Tilia</i> sp.
Oak	Qr	<i>Quercus robur</i>
Poplar	Pop	<i>Populus</i> sp.
Silver birch	Bp	<i>Betula pendula</i>
Sycamore	Ap	<i>Acer pseudoplatanus</i>
Wild cherry	Pa	<i>Prunus avium</i>
Willow	Sx	<i>Salix</i> sp.



Common name	Code	Scientific name
Alder	Ag	<i>Alnus glutinosa</i>
Ash	Fe	<i>Fraxinus excelsior</i>
Blackthorn	Ps	<i>Prunus spinosa</i>
Bramble	Rf	<i>Rubus fruticosus</i>
Butterfly bush	Bd	<i>Buddleja davidii</i>
Common nettle	Ud	<i>Urtica dioica</i>
Common reed	Pc	<i>Phragmites australis</i>
Hawthorn	Cm	<i>Crataegus monogyna</i>
Ivy	Hh	<i>Hedera helix</i>
Lime	Til	<i>Tilia</i> sp.
Oak	Qr	<i>Quercus robur</i>
Poplar	Pop	<i>Populus</i> sp.
Silver birch	Bp	<i>Betula pendula</i>
Sycamore	Ap	<i>Acer pseudoplatanus</i>
Wild cherry	Pa	<i>Prunus avium</i>
Willow	Sx	<i>Salix</i> sp.



Legend

- Target note
- Individual broadleaved tree
- Ps Dominant species
- X Scattered scrub
- X Scattered introduced shrub
- Running water
- Intact hedge - species-poor
- Fence
- Dry ditch
- Mammal trail
- Broadleaved woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- SI Neutral grassland - semi-improved
- Other tall herb and fern - ruderal
- Swamp
- Standing water
- Running water
- A Cultivated/disturbed land - arable
- A Cultivated/disturbed land - amenity grassland
- Introduced shrub
- Building
- Bare ground

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Project : **Portishead Railway**

Drawing : **Phase 1 Habitat Map Sheet 11**

Drawn By : RA	Date : April 2011
Checked By : SET	Date : April 2011
Approved By : DGW	Date : April 2011

Drawing Number: **Figure 2**

Drawing Scale: 1:1,500 Plot Scale: 1:1 @ A3

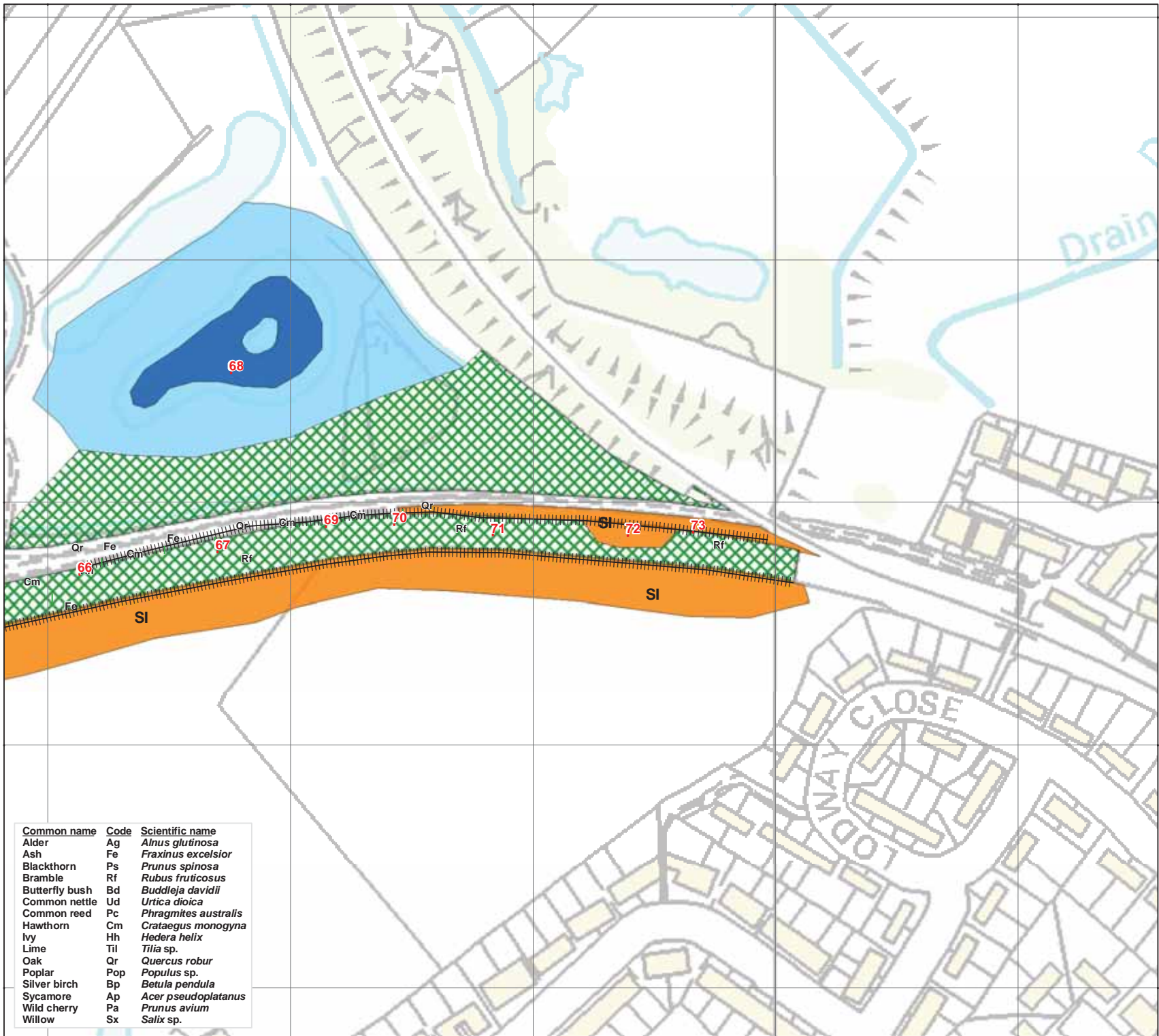
Metres

0

25

50

100



Common name	Code	Scientific name
Alder	Ag	<i>Alnus glutinosa</i>
Ash	Fe	<i>Fraxinus excelsior</i>
Blackthorn	Ps	<i>Prunus spinosa</i>
Bramble	Rf	<i>Rubus fruticosus</i>
Butterfly bush	Bd	<i>Buddleja davidii</i>
Common nettle	Ud	<i>Urtica dioica</i>
Common reed	Pc	<i>Phragmites australis</i>
Hawthorn	Cm	<i>Crataegus monogyna</i>
Ivy	Hh	<i>Hedera helix</i>
Lime	Til	<i>Tilia</i> sp.
Oak	Qr	<i>Quercus robur</i>
Poplar	Pop	<i>Populus</i> sp.
Silver birch	Bp	<i>Betula pendula</i>
Sycamore	Ap	<i>Acer pseudoplatanus</i>
Wild cherry	Pa	<i>Prunus avium</i>
Willow	Sx	<i>Salix</i> sp.



Legend

- Target note
- Individual broadleaved tree
- Ps Dominant species
- X Scattered scrub
- X Scattered introduced shrub
- Running water
- Intact hedge - species-poor
- Fence
- Dry ditch
- Mammal trail
- Broadleaved woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- SI Neutral grassland - semi-improved
- Other tall herb and fern - ruderal
- Swamp
- Standing water
- Running water
- A Cultivated/disturbed land - arable
- A Cultivated/disturbed land - amenity grassland
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- Building
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Project : **Portishead Railway**

Drawing : **Phase 1 Habitat Map Sheet 12**

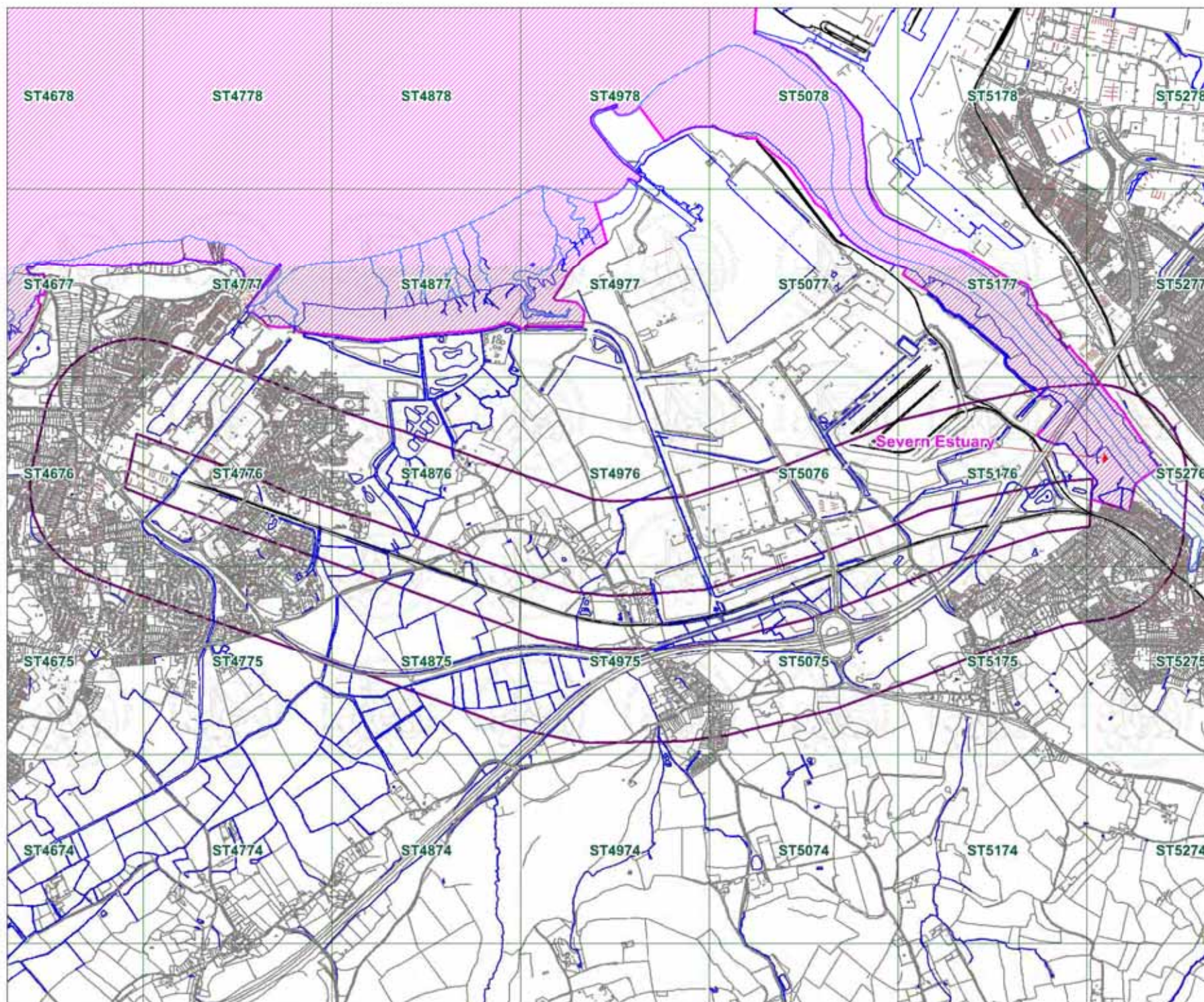
Drawn By : RA	Date : April 2011
Checked By : SET	Date : April 2011
Approved By : DGW	Date : April 2011

Drawing Number: **Figure 2**

Drawing Scale: 1:1,500 Plot Scale: 1:1 @ A3

Metres
0 25 50 100

Appendix C BRERC Maps



Enq1779

Portishead
Railway

SAC

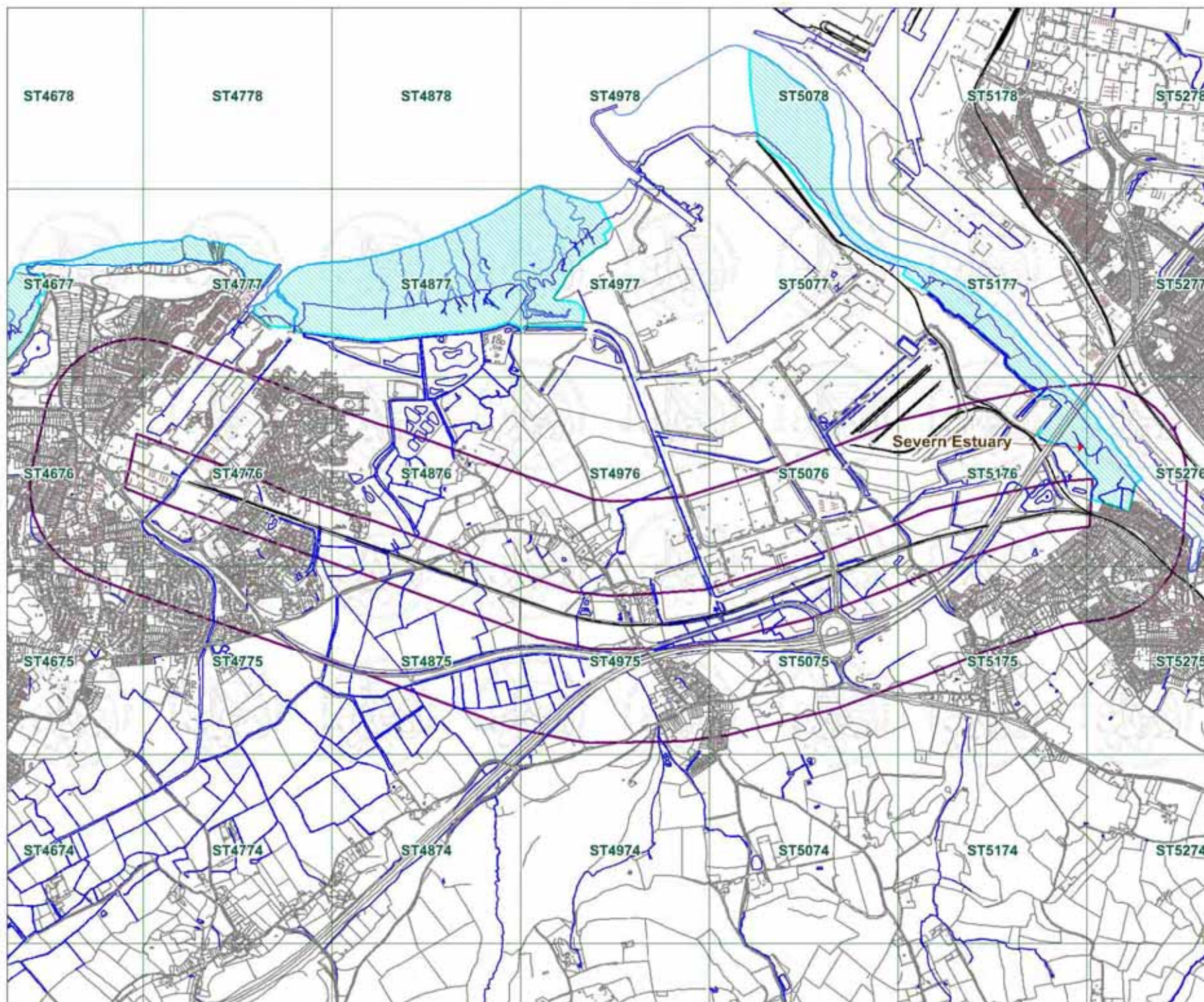
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Enq1779

**Portishead
Railway**

SPA

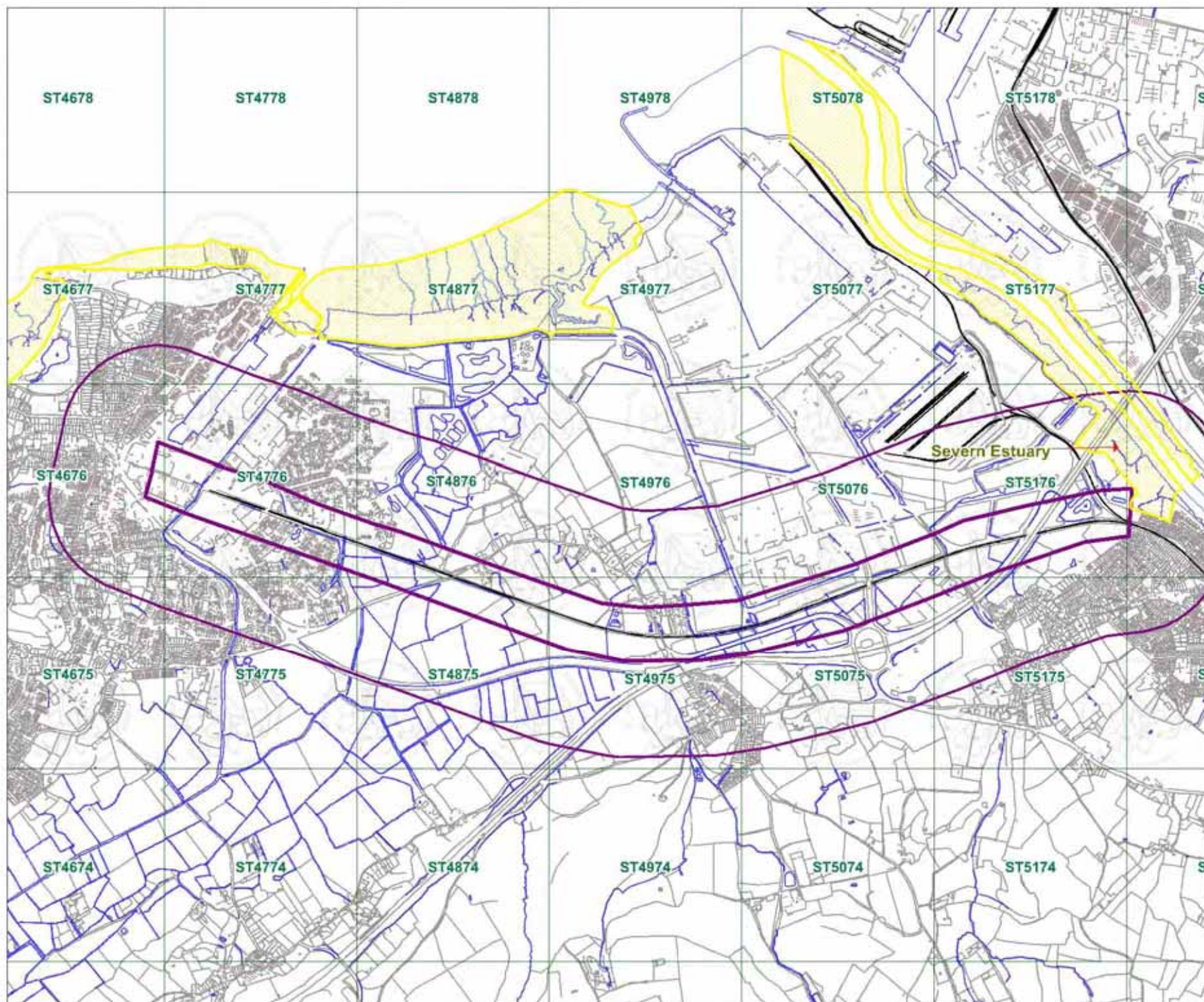
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**Portishead
Railway**

RAMSAR

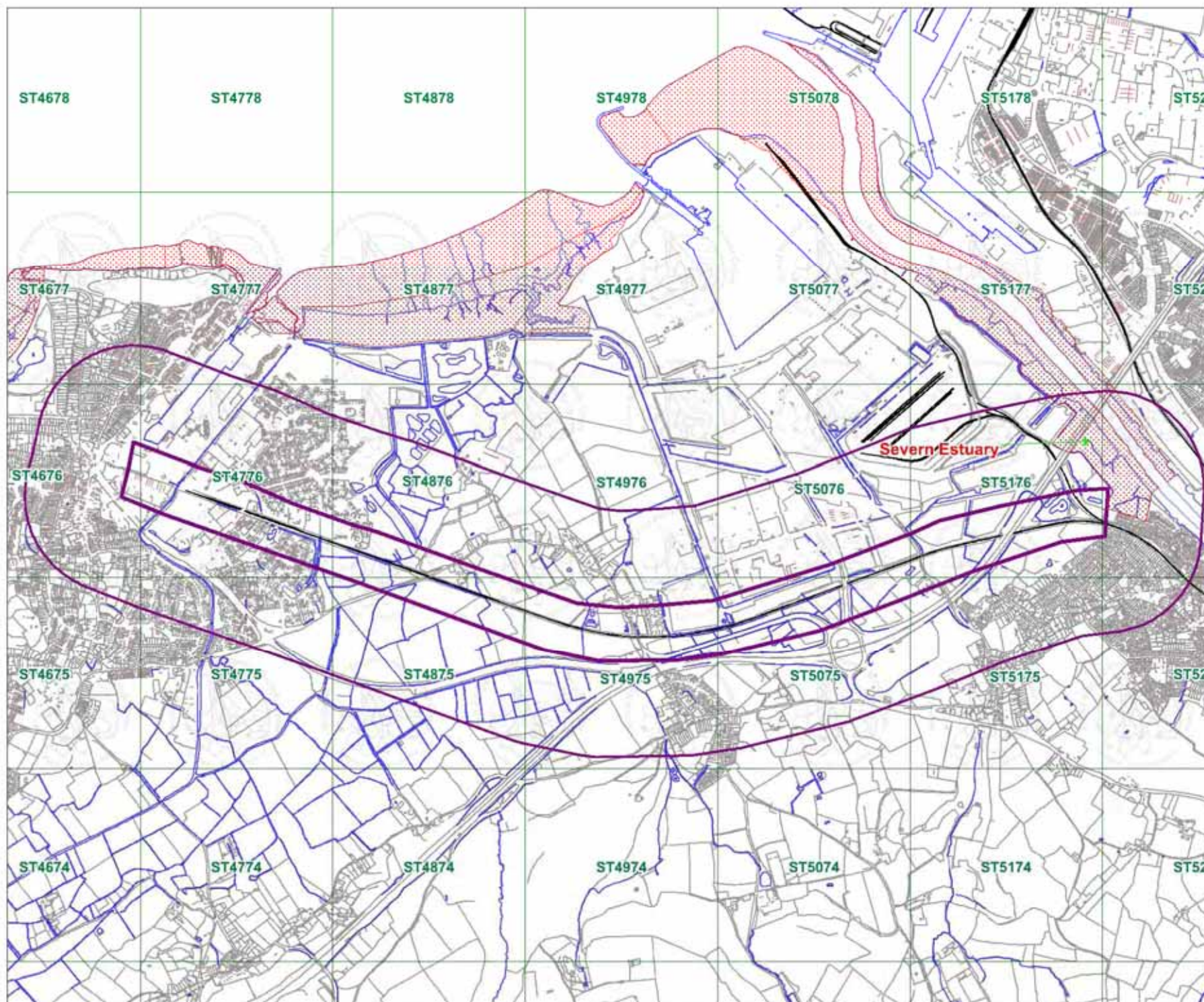
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Railway

SSSI

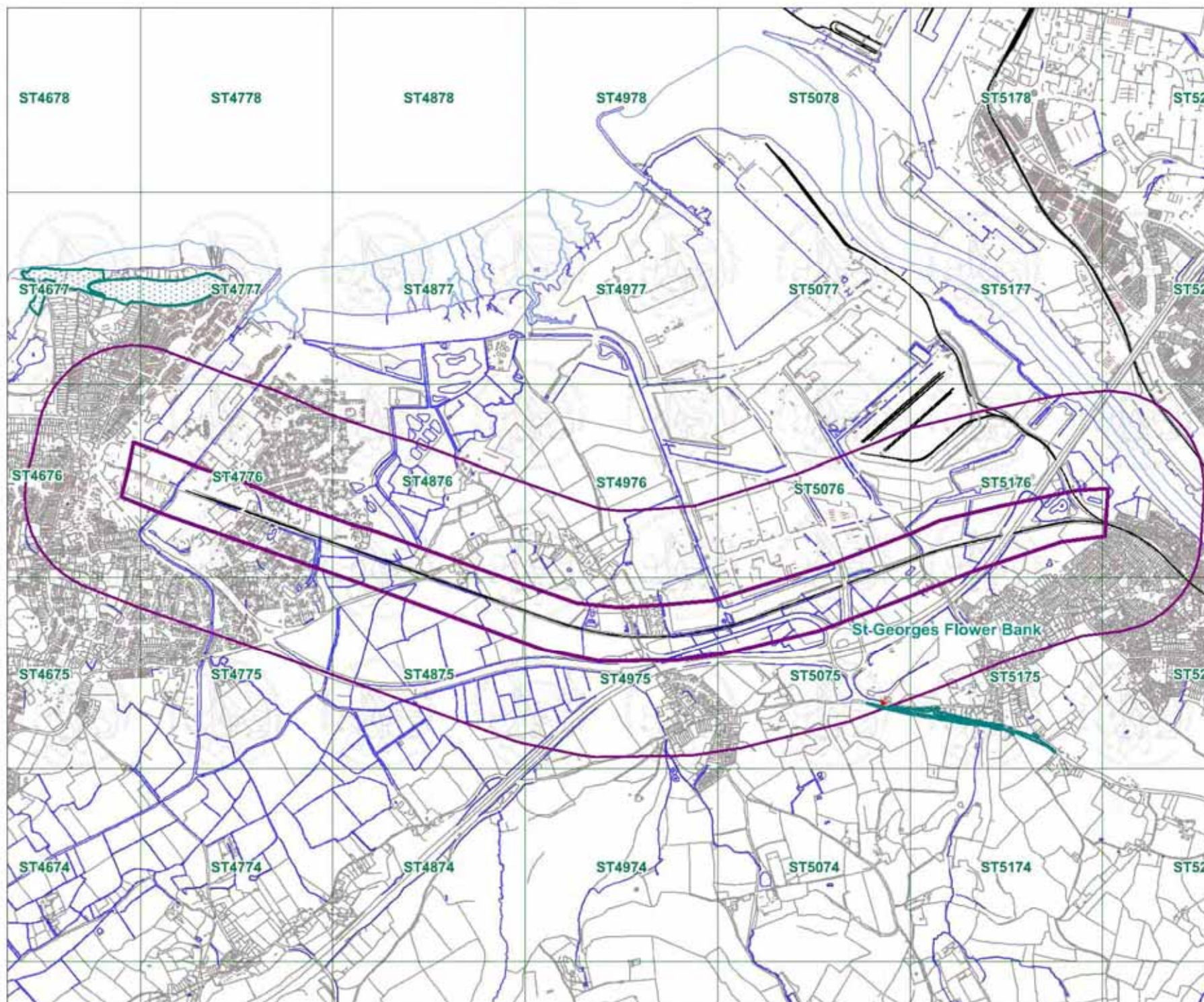
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Portishead Railway

Local Nature Reserves

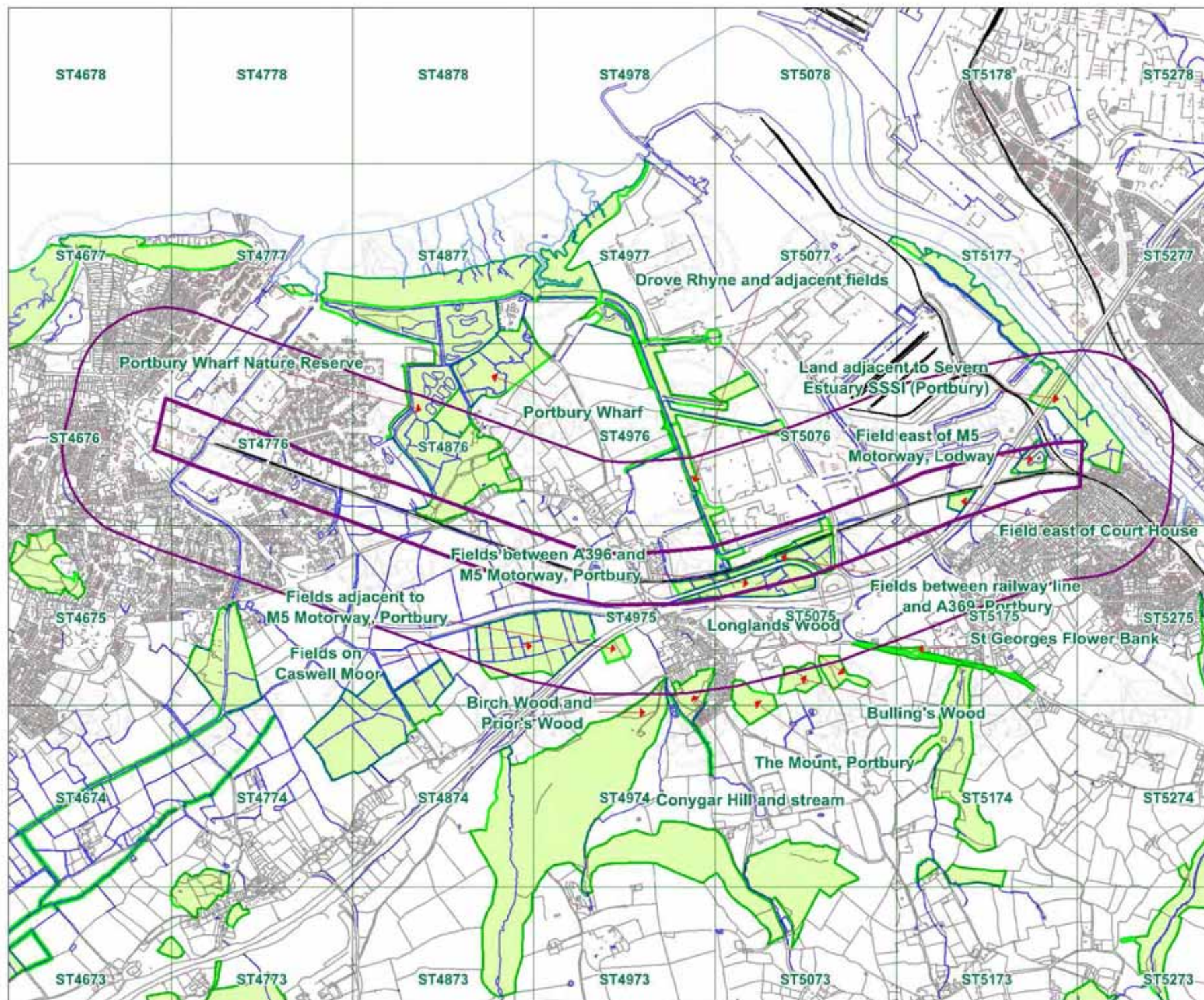
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Portishead Railway

Wildlife sites

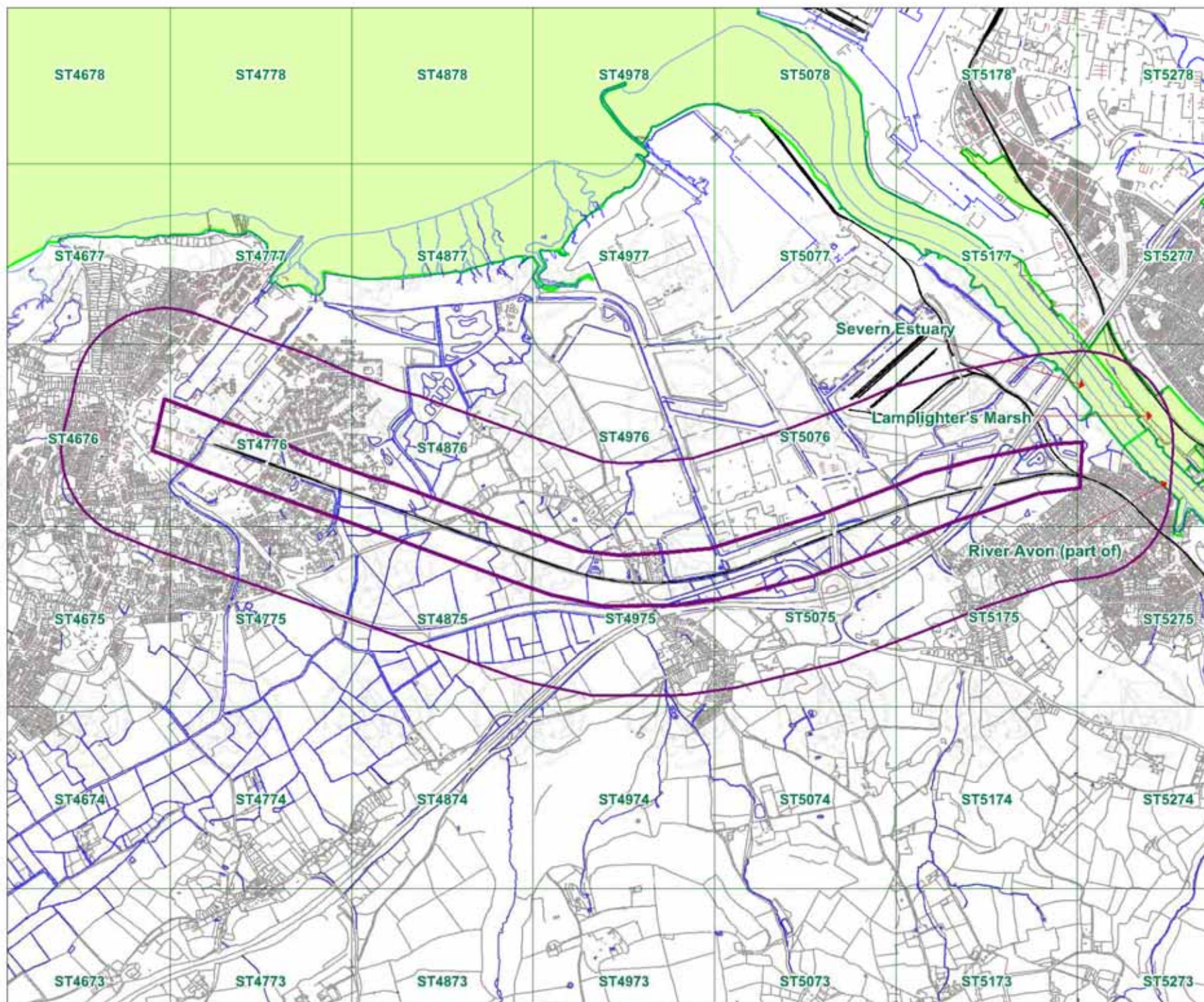
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Railway

SNCI

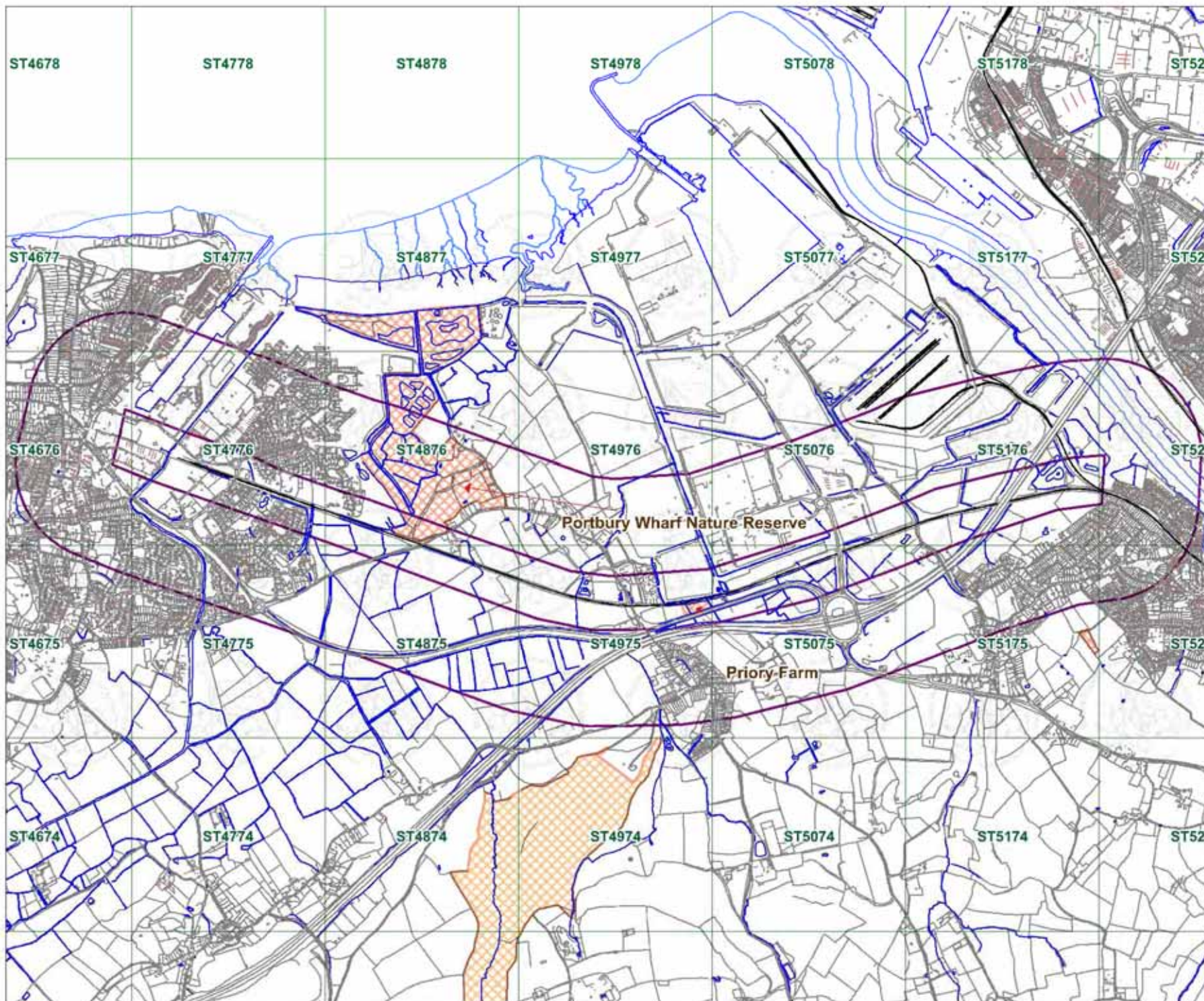
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**Portishead
Railway**

**AWT
Reserves**

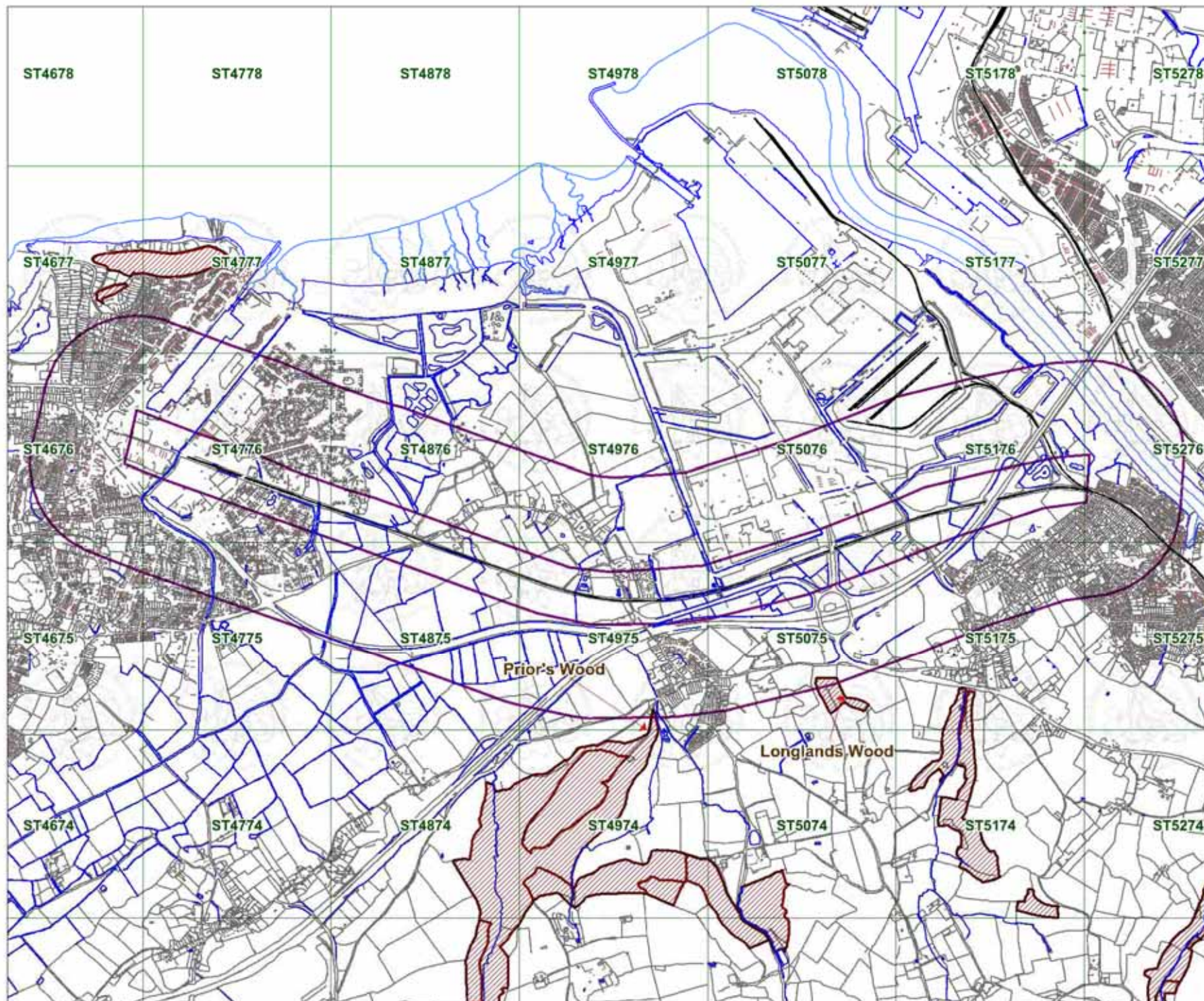
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**Portishead
Railway**

**Ancient
Woodland
Sites**

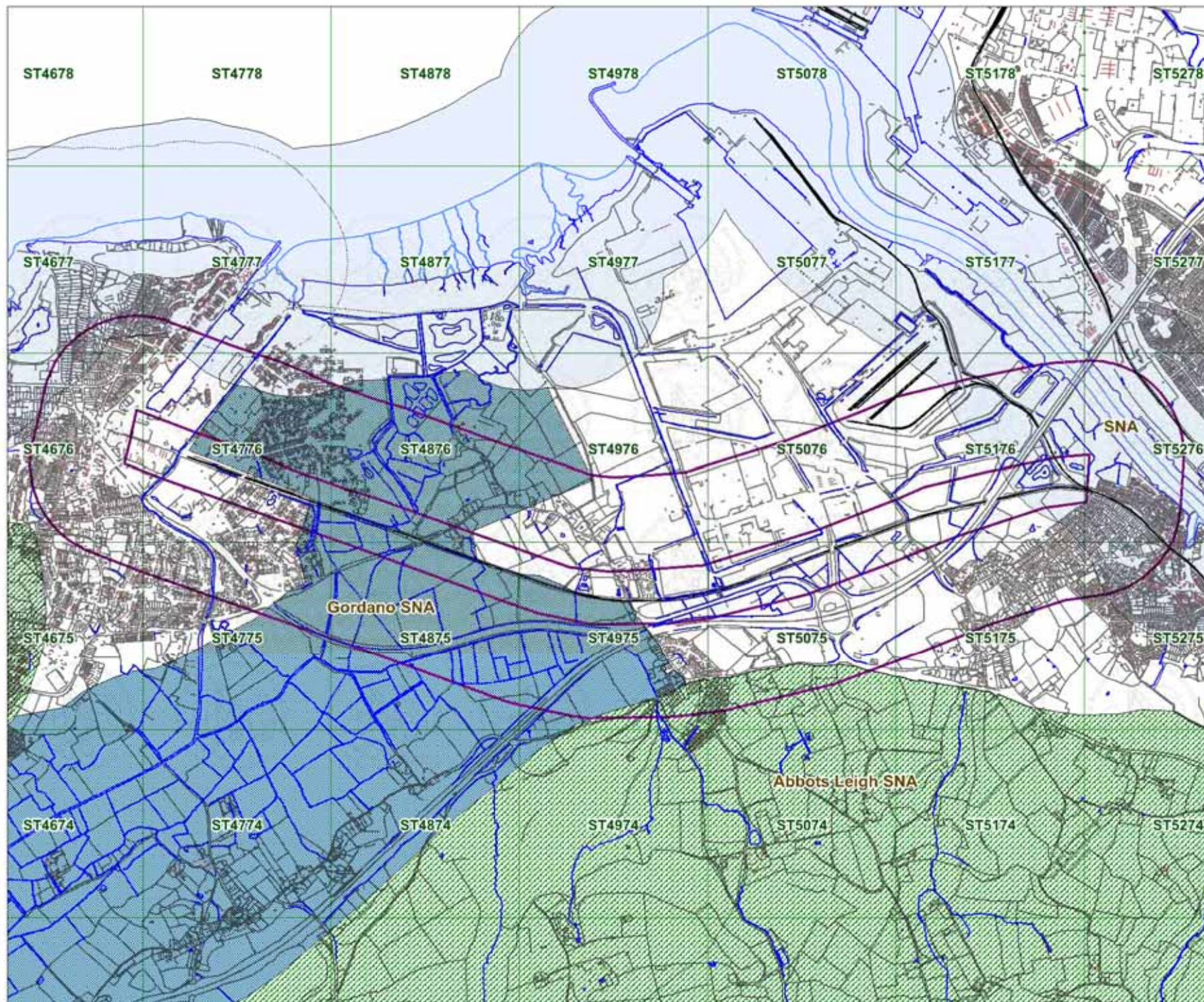
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**Portishead
Railway**

**Strategic
Nature
Areas**

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