Local Development Plan 2021 > 2036

Cardiff Council - January 2025

Deposit Plan

Habitat Regulations Assessment

www.cardiffldp.co.uk
02920 872087
LDP@cardiff.gov.uk

Mae'r ddogfen hon ar gael yn Gymraeg/
This document is available in Welsh

STRONGER FAIRER GREENER

CARDIFF
CAERDYDD

Cardiff Deposit Local Plan

Habitat Regulations Assessment

Cardiff Council

October 2024

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
Stephen Kenny Ecologist	Amelia Kent Principal Ecologist	Dr James Riley Technical Director	Dr James Riley Technical Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
0	01/11/24	Draft	JR	James Riley	Technical Director
1	12/12/24	Final	JR	James Riley	Technical Director

Distribution List

# Hard Copies	PDF Required	Association / Company Name

Prepared for:

Cardiff Council

Prepared by:

AECOM Limited
Midpoint, Alencon Link
Basingstoke
Hampshire RG21 7PP
United Kingdom

T: +44(0)1256 310200
aecom.com

Table of Contents

Figures

Tables

1. Introduction

Background to the project

1.1 AECOM was appointed by Cardiff City Council to assist in undertaking a Habitats Regulations Assessment (HRA) of the Draft version of the new Local Plan for Cardiff (hereafter referred to as the 'Local Plan' or the 'Plan'). The objectives of the assessment are to:

- Identify any aspects of the Local Plan that would cause a likely significant effect on any Habitat Sites, which include Special Areas of Conservation (SACs), candidate SACs (cSACs), Special Protection Areas (SPAs) and potential SPAs (pSPAs) and as a matter of Government policy, Ramsar sites, both in isolation and in combination with other plans and projects;
- Determine whether appropriate assessment would be required; and
- Undertake an analysis to inform the appropriate assessment, with a view to whether any aspects of the plan would have an adverse effect on the integrity of any Habitat sites.

Legislation

1.2 The UK left the European Union (EU) on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 ("the Withdrawal Act"). While the UK is no longer a member of the EU, a requirement for Habitats Regulations Assessment continues as set out in the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019[1]. The ultimate aim of the Directive is to "*maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest*" (Habitats Directive, Article 2(2)).

1.3 The Habitats Directive applies the precautionary principle to Habitat sites. Plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the site(s) in question. Plans and projects with predicted adverse impacts on Habitat sites may still be permitted if there are no reasonable alternatives to them and there are Imperative Reasons of Overriding Public Interest. (IROPI) as to why they should go ahead. In such cases, compensation would be necessary to ensure the overall integrity of the site network.

1.4 In order to ascertain whether or not site integrity will be affected, a Habitats Regulations Assessment should be undertaken of the plan or project in question:

[1] These don't replace the 2017 Regulations but are just another set of amendments.

Box 1. The legislative basis for Appropriate Assessment

Conservation of Habitats and Species Regulations 2017 (as amended)

The Regulations state that:

"*A competent authority, before deciding to … give any consent for a plan or project which is likely to have a significant effect on a European site … shall make an appropriate assessment of the implications for the site in view of that sites conservation objectives… The authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site*".

1.5 Over the years the phrase 'Habitats Regulations Assessment' has come into wide currency to describe the overall process set out in the Conservation of Habitats and Species Regulations from screening through to IROPI. This has arisen in order to distinguish the process from the individual stage described in the law as an 'appropriate assessment'. Throughout this report we use the term Habitats Regulations Assessment for the overall process.

1.6 In spring 2018 the 'Sweetman' European Court of Justice ruling[2] clarified that 'mitigation' (i.e. measures that are specifically introduced to avoid or reduce a harmful effect on a Habitats Site that would otherwise arise) should **not** be taken into account when forming a view on Likely Significant Effects. Mitigation should instead only be considered at the Appropriate Assessment stage. Appropriate assessment is not a technical term: it simply means 'an assessment that is appropriate' for the plan or project in question. As such, the law purposely does not prescribe what it should consist of or how it should be presented; these are decisions to be made on a case by case basis by the competent authority. As this report consists of a test of likely significant effect, mitigation measures are therefore not taken into consideration at this stage.

Report structure

1.7 Section 2 of this report summarises the methodology for the assessment. Section 3 details background information on the Habitat Sites discussed in this report. Section 4 identifies the possible pathway by which adverse effects on protected Habitat sites could arise. Section 5 discusses the results from the test of likely significant effects and Section 5 covers the Appropriate Assessment. The full initial policy screening table is present in Appendix B.

2. Methodology

Introduction

2.1 This section sets out our approach and methodology for undertaking the HRA. Habitats Regulations Assessment itself operates independently from the Planning Policy system, being a legal requirement of a discrete Statutory Instrument.

A proportionate assessment

2.2 Project-related HRA often requires bespoke survey work and novel data generation in order to accurately determine the significance of adverse effects. In other words, to look beyond the risk of an effect to a justified prediction of the actual likely effect and to the development of avoidance or mitigation measures.

2.3 However, the draft CLG guidance[3] makes it clear that when implementing HRA of land-use plans, the AA should be undertaken at a level of detail that is appropriate and proportional to the level of detail provided within the plan itself:

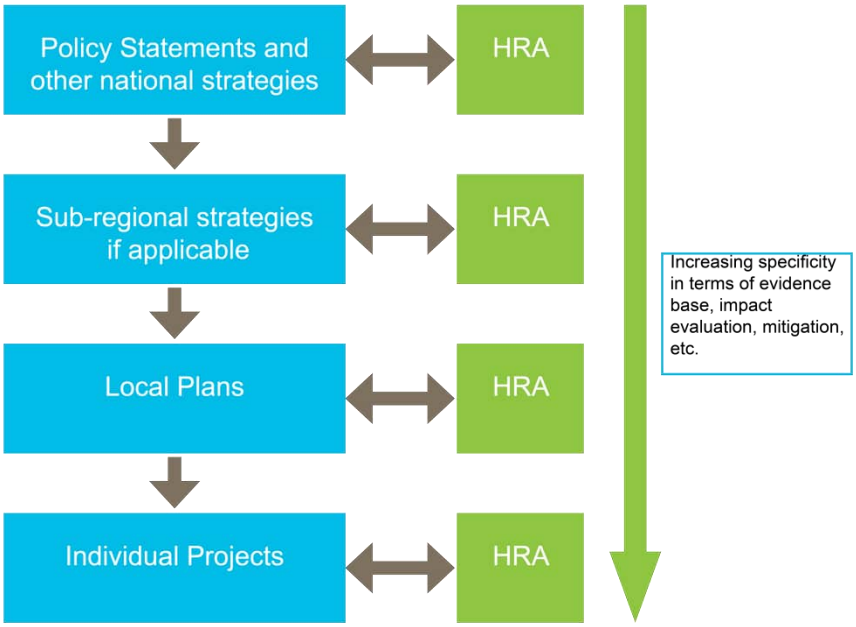
[2] People Over Wind and Sweetman v Coillte Teoranta (C-323/17)
[3] CLG (2006) Planning for the Protection of European Sites, Consultation Paper

2.4 'The comprehensiveness of the [Appropriate] assessment work undertaken should be proportionate to the geographical scope of the option and the nature and extent of any effects identified. An AA need not be done in any more detail, or using more resources, than is useful for its purpose. It would be inappropriate and impracticable to assess the effects [of a strategic land use plan] in the degree of detail that would normally be required for the Environmental Impact Assessment (EIA) of a project.'

2.5 In other words, there is a tacit acceptance that appropriate assessment can be tiered and that all impacts are not necessarily appropriate for consideration to the same degree of detail at all tiers (**Box 2**).

2.6 For a Local Plan the level of detail concerning the developments that will be delivered is usually insufficient to make a highly detailed assessment of significance of effects. For example, precise and full determination of the impacts and significant effects of a new settlement will require extensive details concerning the design of the town, including layout of greenspace and type of development to be delivered in particular locations, yet these data will not be decided until subsequent stages.

2.7 The most robust and defensible approach to the absence of fine grain detail at this level is to make use of the precautionary principle. In other words, the plan is never given the benefit of the doubt; it must be assumed that a policy/measure is likely to have an impact leading to a significant adverse effect upon a Habitat site unless it can be clearly established otherwise.



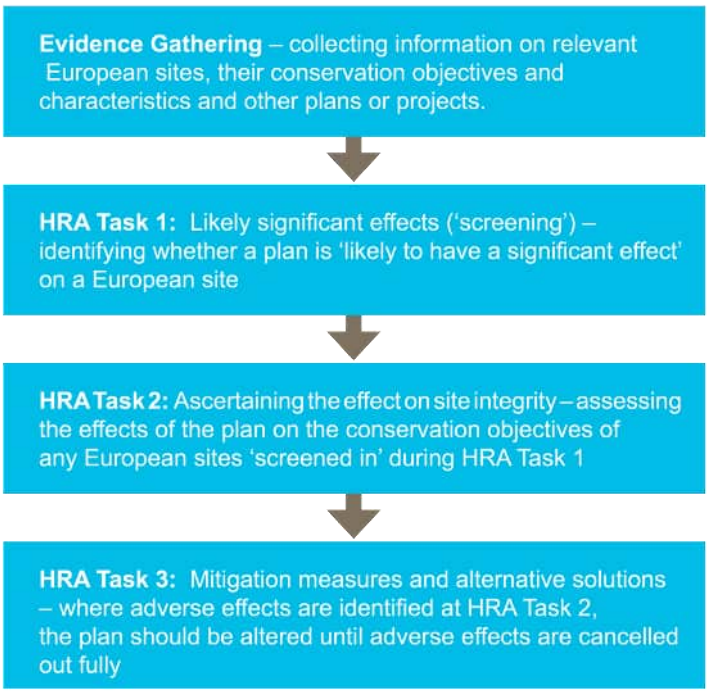
Box 2. Tiering in HRA of Land Use Plans

The process of HRA

2.8 The HRA has been carried out in the continuing absence of formal Government guidance. CLG released a consultation paper on AA of Plans in 2006[4]. As yet, no further formal guidance has emerged.

2.9 Box 3 below outlines the stages of HRA according to current draft CLG guidance. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendation and any relevant changes to the plan until no significant adverse effects remain.

[4] Ibid



Box 3. Four-Stage Approach to Habitats Regulations Assessment

2.10 In practice, this broad outline requires some amendment in order to feed into a developing land use plan such as a Local Plan. The following process has been adopted for carrying out the HRA.

Physical scope

2.11 The physical scope of the assessment i.e. the range of Habitat sites to be considered will be based upon a combination of tracing impact pathways and using distances derived from various studies.

2.12 The Habitat sites of relevance to this HRA are as follows:

- Severn Estuary SPA (Wales) – Within Local Plan Area
- Cardiff Beech Woods SAC – Within Local Plan Area
- Severn Estuary SAC (Wales) – Within Local Plan Area
- Severn Estuary Ramsar (Wales) Within Local Plan Area
- Severn Estuary SAC (England) – ~7.3km southeast of Local Plan Area
- River Usk/Afon Wysg SAC - ~6.6km northeast of Local Plan Area

2.13 These internationally important wildlife sites are identified in Appendix A, Figure 1. These sites like wholly or partly within the Local Plan Area or within the surrounding sphere of influence.

The 'in-combination' scope – other plans and projects

2.14 It is a requirement of the Regulations that the impact and effects of any plan being assessed are not considered in isolation but in combination with other plans and projects that may also be affecting the Habitat sites(s) in question.

2.15 In practice, 'in-combination assessment' is of greatest importance when the Local Plan would otherwise be screened out because the individual contribution is inconsequential. It is neither practical nor necessary to assess the 'in-combination' effects of the Local Plan in the context of all other plans and projects within the region. The principal other plans and projects that have been considered for in-combination effects are:

  - Newport Local Plan

- Vale of Glamorgan Local Plan
- Monmouthshire Local Plan
- Torfaen Local Plan
- Caerphilly Local Plan
- Rhondda Cynon Taf Local Plan

Stage One: Likely Significant Effect test (screening)

2.16 The first stage of any Habitats Regulations Assessment is a Likely Significant Effect (LSE) test - essentially a high level assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

> 'Is the Plan, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon Habitat sites?'

2.17 The objective is to 'screen out' those plans and projects (or site allocations/policies) that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon Habitat sites, usually because there is no mechanism or pathway for an adverse interaction with Habitat sites. This stage is undertaken in Section 4 of this report.

2.18 In evaluating significance, AECOM have relied on our professional judgement as well as the results of previous stakeholder consultation regarding development impacts on the Habitat sites considered within this assessment.

Stage Two: Appropriate Assessment

2.19 Habitat Site(s) which have been 'screened in' during the previous Task will have a detailed assessment undertaken on the effect of the policies on the Habitat Site(s) site integrity. Avoidance and mitigation measures to avoid adverse significant effects will be incorporated where necessary.

2.20 As established by case law, 'appropriate assessment' is not a technical term; it simply means whatever further assessment is necessary to confirm whether there would be adverse effects on the integrity of any Habitat sites that have not been dismissed at Likely Significant Effects. Since it is not a technical term it has no firmly established methodology except that it essentially involves repeating the analysis for the likely significant effects stage, but to a greater level of detail on a smaller number of policies and sites, this time with a view to determining if there would be adverse effects on integrity. For the air quality pathway the appropriate assessment is where detailed traffic and air quality modelling is reported.

2.21 One of the key considerations during appropriate assessment is whether there is available mitigation that would entirely address the potential effect. In practice, the appropriate assessment takes any policies or allocations that could not be dismissed following the high-level Likely Significant Effects analysis and analyse the potential for an effect in more detail, with a view to concluding whether there would actually be an adverse effect on integrity (in other words, disruption of the coherent structure and function of the Habitat site(s)).

2.22 The analysis first subjects each policy or site allocation to screening based upon potential pathways of impact. That is documented in Table 4 in Appendix B. The results of that screening are summarised in Section 4. Policies that cannot be screened out are then taken forward to appropriate assessment in Section 5. Therefore, it should be noted that Appendix B does not present a summary of the whole assessment process.

3. Relevant Habitat Sites

Severn Estuary SPA / Ramsar

Introduction

3.1 The Severn Estuary SPA / Ramsar is located between the borders of Wales and England in south-western Britain. It is a 24,700.91ha large estuary with extensive intertidal mudflats, sandflats, rocky platforms and small islands. The coastline is fringed by saltmarsh, grazing marsh, freshwater and brackish ditches. Its seabed is mainly rocky, gravelly and sub-tidal sandbanks. Due to the estuary's funnel shape, the Severn experiences the second highest tidal range in the world.

3.2 Because of this extreme tidal condition, the SPA / Ramsar is inhabited by plant and animal assemblages that tolerate the physical conditions in the tidal-swept liquid mud, sand and rock. The invertebrate community is species-poor and harbours high densities of ragworms and lugworms. These form important food sources for migrant and wintering waders. The SPA / Ramsar has particular importance as a stopover point for spring and autumn migrant waders, and overwintering swans, ducks and waders. The site also has an extensive intertidal zone, as a consequence of its tidal range. The closest part of the Severn Estuary SPA / Ramsar lies within the administrative boundary of Cardiff.

SPA Qualifying Features[5]

3.3 This site qualifies under **Article 4.1** of the Directive (79/409/EEC) by supporting populations (counts are all at time of designation and could have changed since) of European importance of the following species listed on Annex I of the Directive:

Over winter

- Bewick's swan *Cygnus columbianus bewickii*, 280 individuals representing at least 4.0% of the wintering population in Great Britain (5 year peak mean 1991/2 - 1995/6)

3.4 This site also qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

3.5 On passage

- Ringed plover *Charadrius hiaticula*, 655 individuals representing at least 1.3% of the Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6)

3.6 Over winter

- Curlew *Numenius arquata*, 3,903 individuals representing at least 1.1% of the wintering Europe - breeding population (5 year peak mean 1991/2 - 1995/6)
- Dunlin *Calidris alpina alpina*, 44,624 individuals representing at least 3.2% of the wintering Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/2 - 1995/6)
- Pintail *Anas acuta*, 599 individuals representing at least 1.0% of the wintering Northwestern Europe population (5 year peak mean 1991/2 - 1995/6)
- Redshank *Tringa totanus*, 2,330 individuals representing at least 1.6% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)
- Shelduck *Tadorna tadorna*, 3,330 individuals representing at least 1.1% of the wintering Northwestern Europe population (5 year peak mean 1991/2 - 1995/6)

Assemblage qualification: A wetland of international importance

3.7 The area qualifies under **Article 4.2** of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl.

[5] http://archive.jncc.gov.uk/default.aspx?page=2066 [Accessed on the 25/04/2023]

3.8 Over winter, the area regularly supports 93,986 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: Gadwall *Anas strepera*, shelduck *Tadorna tadorna*, pintail *Anas acuta*, dunlin *Calidris alpina alpina*, curlew *Numenius arquata*, redshank *Tringa totanus*, Bewick's swan *Cygnus columbianus bewickii*, wigeon *Anas penelope*, lapwing *Vanellus vanellus*, teal *Anas crecca*, mallard *Anas platyrhynchos*, shoveler *Anas clypeata*, pochard *Aythya ferina*, tufted duck *Aythya fuligula*, grey plover *Pluvialis squatarola*, white-fronted goose *Anser albifrons albifrons*, whimbrel *Numenius phaeopus*.

3.9 According to NRW's most recent site condition assessment[6], three of the qualifying species in the Severn Estuary SPA are in unfavourable condition, including Bewick's swan, European white-fronted goose and dunlin. For all species this is due to long-term population declines, potentially fuelled by shifts in winter distribution and reflecting population declines at the national scale. However, access and recreation are also identified as a potential source for population-level effects.

Ramsar Qualifying Features[7]

3.10 The Severn Estuary is designated as a Ramsar site under the following criteria:

Criterion 1

Due to the immense tidal range (second-largest in world), which affects both the physical environment and biological communities

Habitats Directive Annex I features present include sandbanks which are slightly covered by sea water all the time, estuaries, mudflats and sandflats not covered by sweater at low tide and Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

Criterion 3

Due to unusual estuarine communities, reduced diversity and high productivity

Criterion 4

This site is important for the run of migratory fish between sea and river via estuary. Species include salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla anguilla*. It is also of particular importance for migratory birds during spring and autumn.

Criterion 5: Assemblages of international importance

Species with peak counts in winter

70,919 waterfowl (5 year peak mean 1998/99-2002/2003).

Criterion 6: Species / populations occurring at levels of international importance

Species with peak counts in winter

- Tundra swan *Cygnus columbianus bewickii*; 229 individuals representing an average of 2.8% of the GB population (5 year peak mean 1998/99-2002/03)
- Greater white-fronted goose *Anser albifrons*; 2,076 individuals representing an average of 35.8% of the GB population (5 year peak mean 1996/97-2000/01)
- Common shelduck *Tadorna tadorna*; 3,223 individuals representing an average of 1% of the NW Europe population (5 year peak mean 1998/99-2002/03)
- Gadwall *Anas strepera strepera*; 241 individuals representing an average of 1.4% of the GB population (5 year peak mean 1998/99-2002/03)

[6] NRW. (January 2018). Special Protection Areas in Welsh waters – Indicative site level feature condition assessments 2018. NRW Evidence Report No. 236. 44pp. Available at: https://cdn.cyfoethnaturiol.cymru/media/683655/special-protection-areas-in-welsh-waters.pdf [Accessed on the 29/05/2023]
[7] https://jncc.gov.uk/jncc-assets/RIS/UK11081.pdf [Accessed on the 25/04/2023]

- Dunlin *Calidris alpina alpina*; 25,082 individuals representing an average of 1.8% of the W Siberia and W Europe population (5 year peak mean 1998/99-2002/03)
- Common redshank *tringa totanus tetanus*; 2,616 individuals representing an average of 1% of the population (5 year peak mean 1998/99-2002/03)

Species / populations identified subsequent to designation for possible future consideration under criterion 6

Species regularly supported during the breeding season

- Lesser black-backed gull *Larus fuscus graellsii*; 4,167 apparently occupied nests, representing an average of 2.8% of the breeding population (Seabird 2000 Census)

3.11 Species with peak counts in spring / autumn

- Ringed plover *Charadrius hiaticula*; 740 individuals representing an average of 1% of the Europe and NW Africa population (5 year peak mean 1998/99-2002/03)

3.12 Species with peak counts in winter

- Eurasian teal *Anas crecca*; 4,456 individuals representing an average of 1.1% of the NW Europe population (5 year peak mean 1998/99-2002/03)
- Northern pintail *Anas acuta*; 756 individuals representing an average of 1.2% of the NW Europe population (5 year peak mean 1998/99-2002/03)

Criterion 8

The fish of the whole estuarine and river system is one of the most diverse in Britain, with over 110 species recorded. Salmon *Salmo salar*, sea trout *S. trutta*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, allis shad *Alosa alosa*, twaite shad *A. fallax*, and eel *Anguilla anguilla* use the Severn Estuary as a key migration route to their spawning grounds in the many tributaries that flow into the estuary. The site is important as a feeding and nursery ground for many fish species particularly allis shad *Alosa alosa* and twaite shad *A. fallax* which feed on mysid shrimps in the salt wedge.

SPA Conservation Objectives

3.13 The Conservation Objectives for the Severn Estuary designated sites are lengthy and are therefore not reproduced in this document. They are provided here: The Severn Estuary / Môr Hafren

3.14 In broad terms the objectives are detailed and specific variations on the following generic requirement. To ensure the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- The extent and distribution of the habitats of the qualifying features
- The structure and function of the habitats of the qualifying features
- The supporting processes on which the habitats of the qualifying features rely
- The population of each of the qualifying features, and,
- The distribution of the qualifying features within the site.

Threats and Pressures to Site Integrity[8]

3.15 CCW (now NRW) and Natural England have published an advice note on the Severn Estuary EMS[9], which discusses the types of operations that may cause deterioration or disturbance to the qualifying features of the SPA. Furthermore, the following threats and pressures to the site integrity of the Severn Estuary SPA have been identified in Natural England's Site Improvement Plan:

[8] http://publications.naturalengland.org.uk/publication/4590676519944192 [Accessed on the 25/04/2023]
[9] Available at: https://publications.naturalengland.org.uk/publication/3184206?category=3212324 [Accessed on the 02/05/2023]

- Public access / disturbance
- Physical modification
- Impacts of development
- Coastal squeeze
- Change in land management
- Changes in species distributions
- Water pollution
- Air pollution: Impact of atmospheric nitrogen deposition
- Marine consents and permits: Minerals and waste
- Fisheries: Recreational marine and estuarine
- Fisheries: Commercial marine and estuarine
- Invasive species
- Marine litter
- Marine pollution incidents

Severn Estuary SAC

Introduction

3.16 The Severn Estuary SAC was designated as a SAC in 2009, because it supports a significant number of habitats and species. It covers an area of 74,000ha and is designated partly for its estuary feature. Within this feature, subtidal sandbanks, intertidal mudflats and sandflats, Atlantic salt meadows and biogenic reefs are included. The SAC also harbours three migratory fish species, including river lamprey, sea lamprey and twaite shad. The Severn Estuary also comprises hard substrate habitats, an assemblage of 114 estuarine and marine fish species and various waterfowl species. The Severn Estuary SAC overlaps with the Severn Estuary SPA / Ramsar, and also lies within the boundary of Cardiff local authority.

Qualifying Features[10]

3.17 Annex I habitats that are a primary reason for selection of this site:

- Estuaries
- Mudflats and sandflats not covered by seawater at low tide
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae)

3.18 Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

- Sandbanks which are slightly covered by sea water all the time
- Reefs

3.19 Annex II species that are a primary reason for selection of this site:

- Sea lamprey Petromyzon marinus
- River lamprey Lampetra fluviatilis
- Twaite shad *Alosa fallax*

[10] https://sac.jncc.gov.uk/site/UK0013030 [Accessed on the 25/04/2023]

3.20 According to NRW's most recent site condition assessment[11], the majority of qualifying features in the Severn Estuary SAC are in unfavourable condition. For example, the distribution / extent, structure / function and typical species of Atlantic saltmarsh are all in unfavourable condition. This is due to a range of impact pathways, including coastal squeeze (predicted to result in the loss of 38ha of intertidal sand- and mudflats) and water quality (e.g. moderate overall status and fail for water chemistry in one waterbody overlapping with this habitat type).

Conservation Objectives

3.1 The Conservation Objectives for the Severn Estuary designated sites are lengthy and are therefore not reproduced in this document. They are provided here: The Severn Estuary / Môr Hafren

3.2 In broad terms the objectives are detailed and specific variations on the following generic requirement. To ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.

Threats and Pressures to Site Integrity[12]

3.3 CCW (now NRW) and Natural England have published an advice note on the Severn Estuary EMS[13], which discusses the types of operations that may cause deterioration or disturbance to the qualifying features of the SAC. Furthermore, the following threats and pressures to the site integrity of the Severn Estuary SAC have been identified in Natural England's Site Improvement Plan:

- Public access / disturbance
- Physical modification
- Impacts of development
- Coastal squeeze
- Change in land management
- Changes in species distributions
- Water pollution
- Air pollution: Impact of atmospheric nitrogen deposition
- Marine consents and permits: Minerals and waste
- Fisheries: Recreational marine and estuarine
- Fisheries: Commercial marine and estuarine

[11] NRW. (January 2018). Severn Estuary Special Area of Conservation: Indicative site level feature condition assessments 2018. NRW Evidence Report No. 235. 41pp. Available at: https://cdn.cyfoethnaturiol.cymru/media/684391/severn-sac-ica-2018.pdf [Accessed on the 29/05/2023]
[12] http://publications.naturalengland.org.uk/publication/4590676519944192 [Accessed on the 25/04/2023]
[13] Available at: https://publications.naturalengland.org.uk/publication/3184206?category=3212324 [Accessed on the 02/05/2023]

- Invasive species
- Marine litter
- Marine pollution incidents

Cardiff Beech Woods SAC

Introduction

3.4 The Cardiff Beech Woods SAC is a 114.45ha large site comprising broad-leaved deciduous woodland (99.5%) and some developed tracts (0.5%). It represents an area of semi-natural broadleaved woodland dominated by beech. The SAC is considered one of the best examples of beech forest in the UK, representing this habitat close to its western limit of distribution. Mosaics and transitions to other woodland types are found throughout the SAC, such as acidic beech woodland and oak *Quercus* and ash *Fraxinus excelsior* woods. Characteristic and notable species in the ground flora include ramsons *Allium ursinum*, sanicle *Sanicula europea*, bird's-nest orchid *Neottia nidus-avis* and yellow bird's-nest orchid *Monotropa hypopitis*.

3.5 The SAC also supports significant stretches of *Tilio-Acerion* forests of slopes, screes and ravines, comprising ash *Fraxinus excelsior*, wych elm *Ulmus glabra* and small-leaved lime *Tilia cordata*. Introduced sycamore *Acer pseudoplatanus* is frequently present throughout.

Qualifying Features[14]

3.6 Annex I habitats that are a primary reason for selection of this site:

- Asperulo-Fagetum beech forests

3.7 Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

- *Tilio-Acerion* forests of slopes, screes and ravines (* priority feature)

3.8 NRW's 2020 Baseline Evaluation project[15] assessed the condition of qualifying features across Wales' protected sites. The data indicate that both qualifying woodland types are currently in unfavourable condition as indicated through various performance indicators.

Conservation Objectives[16]

3.9 The conservation status of a natural habitat is the sum of the influences acting on it and its typical species that may affect its long-term natural distribution, structure and functions as well as the long term survival of its typical species. The conservation status of a natural habitat will be taken as favourable when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable.

3.10 The conservation status of a species is the sum of the influences acting on the species that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' when:

- Population dynamics data on the species indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and

[14] https://sac.jncc.gov.uk/site/UK0030109 [Accessed on the 25/04/2023]
[15] Available at: https://naturalresources.wales/evidence-and-data/research-and-reports/protected-sites-baseline-assessment-2020/?lang=en [Accessed on the 30/05/2023]
[16] https://naturalresources.wales/media/672066/FINAL%20Cdf%20Beech%20Woods%20SAC%20Man%20Plan.pdf [Accessed on the 25/04/2023]

- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Threats / Pressures to Site Integrity[17]

3.11 The following performance indicators for factors affecting the Cardiff Beech Woods SAC are specified in NRW's Core Management Plan:

- Recreational use
- Atmospheric pollution
- Development pressure
- Commercial forestry
- Mineral extraction

River Usk/Afon Wysg SAC

SAC Qualifying Features[18]

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

- Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

Annex II species that are a primary reason for selection of this site:

- Sea lamprey *Petromyzon marinus*
- Brook lamprey *Lampetra planeri*
- River lamprey *Lampetra fluviatilis*
- Twaite shad *Alosa fallax*
- Atlantic salmon *Salmo salar*
- Bullhead *Cottus gobio*
- European otter *Lutra lutra*

Annex II species present as a qualifying feature, but not a primary reason for site selection:

- Allis shad *Alosa alosa*

SAC Conservation Objectives

- The Conservation Objective for the watercourse must be met
- The population of the feature in the SAC is stable or increasing over the long term
- The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future.
- There is, and will probably continue to be, a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis.
- The population of otters in the SAC is stable or increasing over the long term and reflects the natural carrying capacity of the habitat within the SAC, as determined by natural levels of prey abundance and associated territorial behaviour.

[17] Ibid.
[18] https://afonyddcymru.org/wp-content/uploads/2022/11/river_usk-sac-core-plan.pdf [Accessed 12/07/2024]

- The natural range of otters in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future. The natural range is taken to mean those reaches that are potentially suitable to form part of a breeding territory and/or provide routes between breeding territories. The whole area of the Usk SAC is considered to form potentially suitable breeding habitat for otters. The size of breeding territories may vary depending on prey abundance. The population size should not be limited by the availability of suitable undisturbed breeding sites. Where these are insufficient, they should be created through habitat enhancement and where necessary the provision of artificial holts. No otter breeding site should be subject to a level of disturbance that could have an adverse effect on breeding success. Where necessary, potentially harmful levels of disturbance must be managed.

- The safe movement and dispersal of individuals around the SAC is facilitated by the provision, where necessary, of suitable riparian habitat, and underpasses, ledges, fencing etc at road bridges and other artificial barriers.

- The natural range of the plant communities represented within this feature should be stable or increasing in the SAC. The natural range is taken to mean those reaches where predominantly suitable habitat exists over the long term. Suitable habitat and associated plant communities may vary from reach to reach. Suitable habitat is defined in terms of nearnatural hydrological and geomorphological processes and forms e.g. depth and stability of flow, stability of bed substrate, and ecosystem structure and functions e.g. nutrient levels, shade (as described in the Site description section). Suitable habitat for the feature need not be present throughout the SAC but where present must be secured for the foreseeable future, except where natural processes cause it to decline in extent.

- The area covered by the feature within its natural range in the SAC should be stable or increasing.

- More information on the typical species expected to be found with each management unit in the SAC is required.

Threats / Pressures to Site Integrity[19]

3.12 The following performance indicators for factors affecting the Cardiff Beech Woods SAC are specified in NRW's Core Management Plan:

- Hydrological processes, in particular river flow (level and variability) and water chemistry, determine a range of habitat factors of critical importance to the SAC features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature.

- Geomorphological processes of erosion by water and subsequent deposition of eroded sediments downstream, create the physical structure of the river habitats. Whilst some sections of the river are naturally stable, especially where they flow over bedrock, others undergo constant and at times rapid change through the erosion and deposition of bed and bank sediments as is typical of meandering sections within floodplains (called 'alluvial' rivers). These processes help to sustain the river ecosystem by allowing a continued supply of clean gravels and other important substrates to be transported downstream.

- Riparian habitats - Diverse and high-quality riparian habitats have a vital role in maintaining the SAC features in a favourable condition. The type and condition of riparian vegetation influences shade and water temperature, nutrient run-off from adjacent land, the availability of woody debris to the channel and inputs of leaf litter and invertebrates to support in-steam consumers. Light, temperature and nutrient levels influence in-stream plant production and habitat suitability for the SAC features.

- Habitat connectivity - is an important property of river ecosystem structure and function. Many of the fish that spawn in the river are migratory, depending on the maintenance of suitable conditions on their migration routes to allow the adults to reach available spawning habitat and juvenile fish to migrate downstream. The dispersal of semi-terrestrial species, such as the otter, can be adversely affected by structures such as bridges under certain flow conditions.

[19] Ibid.

4. Pathways of Impact

4.1 No pathways of impact connecting development in Cardiff to the River Usk SAC have been identified. That SAC is therefore not discussed further in this report.

4.2 Given that we foresee a changing climate, despite the uncertainty of the nature, degree and timing of those changes, environmental stakeholders must address the need to ensure the resilience of each SAC or SPA to that changing environment. However, the purpose of the Local Plan HRA is to assess whether the Local Plan will result in direct effects on specific SACs or SPAs. Climate change is a broader issue that does not relate to specific individual European sites but to the environment generally. As such this is an issue more appropriately captured in the broader environmental and biodiversity consideration given to the Local Plan by the Sustainability Appraisal. Similarly, where the Local Plan will have positive effects of SACs and SPAs, these are not discussed in the HRA as the HRA process focusses on the potential for negative effects.

Direct loss of habitat

4.3 In some instances there could be direct habitat loss from Habitats sites, which could easily result in an adverse effect on those sites.

Recreational Pressure and Disturbance

Introduction

4.4 Recreational use of a Habitat site has the potential to:

- Prevent appropriate management or exacerbate existing management difficulties;
- Cause damage through erosion and fragmentation;
- Cause eutrophication as a result of dog fouling; and,
- Cause disturbance to sensitive species, particularly ground-nesting birds and wintering wildfowl.

4.5 Different types of Habitat sites are subject to different types of recreational pressures and have different vulnerabilities. Studies across a range of species have shown that the effects from recreation can be complex.

4.6 It should be emphasised that recreational use is not inevitably a problem. Many Habitat sites also contain nature reserves managed for conservation and public appreciation of nature. At these sites, access is encouraged and resources are available to ensure that recreational use is managed appropriately. However, recreation often requires management to avoid harm in more sensitive locations.

Mechanical/Abrasive Damage and Nutrient Enrichment

4.7 Most types of terrestrial Habitat site can be affected by soil compaction and erosion, which can arise as a result of visits by walkers, cyclists, horse-riders and users of off-road vehicles. Walkers with dogs contribute to pressure on sites through nutrient enrichment via dog fouling and also have potential to cause greater disturbance to fauna as dogs are less likely to keep to marked footpaths and move more erratically. Motorcycle scrambling and off-road vehicle use can cause serious erosion, as well as disturbance to sensitive species.

4.8 designated for habitats and species that could be adversely affected by excessive trampling and erosion to their supporting habitats.

Disturbance

4.9 Concern regarding the effects of disturbance on birds stems from the fact that they are expending energy unnecessarily and the time they spend responding to disturbance is time that is not spent feeding[20]. Disturbance therefore risks increasing energetic output while reducing energetic input, which can

[20] Riddington, R. *et al*. 1996. The impact of disturbance on the behaviour and energy budgets of Brent geese. *Bird Study* 43:269-279

adversely affect the 'condition' and ultimately survival of the birds. In addition, displacement of birds from one feeding site to others can increase the pressure on the resources available within the remaining sites, as they have to sustain a greater number of birds[21].

4.10 Human activity can affect birds either directly (e.g. through causing them to flee) or indirectly (e.g. through damaging their habitat). The most obvious direct effect is that of immediate mortality such as death by shooting, but human activity can also lead to behavioural changes (e.g. alterations in feeding behaviour, nest abandonment, avoidance of certain areas etc.) and physiological changes (e.g. an increase in heart rate) that, although less noticeable, may ultimately result in major population-level effects by altering the balance between immigration/birth and emigration/death.[22]

4.11 The following Habitat designated sites are vulnerable to recreational pressure and/or disturbance resulting from the Plan either alone or 'in-combination' with other plans and projects:

- Severn Estuary SAC/SPA/Ramsar (stretching along the south-east boundary of the authority);
- Cardiff Beech Woods SAC (situated in the north of the authority).

Loss of Functionally Linked Land

4.12 While most Habitat sites have been geographically defined to encompass the key features that are necessary for coherence of their structure and function, and the support of their qualifying features, this is not necessarily the case. A diverse array of qualifying species including birds and fish are not always confined to the boundary of designated sites.

4.13 For example, the highly mobile nature of both wader and waterfowl species implies that areas of habitat of crucial importance to the integrity of qualifying populations lie outside the physical limits of Habitat sites. Despite not being part of the formal designation, these habitats are integral to the maintenance of the structure and function of the designated site, for example by encompassing important foraging grounds. Therefore, land use plans that may affect such functionally linked habitat require further assessment.

4.14 There is now an abundance of authoritative examples of HRA cases on plans affecting bird populations, where Natural England recognised the potential importance of functionally linked land[23]. For example, bird surveys in relation to a previous HRA established that approximately 25% of the golden plover population in the Somerset Levels and Moors SPA were affected while on functionally linked land, and this required the inclusion of mitigation measures in the relevant plan policy wording. Another important case study originates from the Mersey Estuary SPA / Ramsar, where adjacently located functionally linked land had a peak survey count of 108% of the 5 year mean peak population of golden plover. This finding led to considerable amendments in the planning proposal to ensure that the site integrity was not adversely affected.

4.15 Generally, the identification of an area as functionally linked habitat is not always a straightforward process. The importance of non-designated land parcels may not be apparent and thus might require the analysis of existing data sources (e.g. Bird Atlases or data from record centres) to be firmly established. In some instances, data may not be available at all, requiring further survey work.

4.16 The following Habitat designated sites are vulnerable to loss of functionally linked land resulting from the Plan either alone or 'in-combination' with other plans and projects:

- Severn Estuary SAC/SPA/Ramsar (stretching along the south-east boundary of the authority);

Water Quantity, Level and Flow

4.17 The water level, its flow rates and the mixing conditions are important determinants of the condition of Habitat sites and their qualifying features. Hydrological processes are critical in influencing habitat characteristics in coastal waters, including current velocity, water depth, dissolved oxygen levels, salinity and water temperature. In turn these parameters determine the short- and long-term viability of plant and

[21] Gill, J.A., Sutherland, W.J. & Norris, K. 1998. The consequences of human disturbance for estuarine birds. *RSPB Conservation Review* 12: 67-72
[22] Riley, J. 2003. Review of Recreational Disturbance Research on Selected Wildlife in Scotland. Scottish Natural Heritage.
[23] Chapman C & Tyldesley D. 2016. Functional linkage: How areas that are functionally linked to European sites have been considered when they may be affected by plans and projects – A review of authoritative decisions. *Natural England Commissioned Reports* **207**. 73pp

animal species, as well as overall ecosystem composition. Changes to the water flow rate within an estuary can be associated with a multitude of further impact pathways, including substratum loss, smothering and changes in wave exposure.

4.18 Coastal environments rely on hydrological connections with freshwater bodies, such as rivers, streams and lakes. However, while the natural fluctuation of water levels within narrow limits is desirable, excess or too little water supply might cause water levels to be outside of the required range of qualifying birds and fish, or the invertebrate or plant assemblages they depend upon. There are two mechanisms through which urban development might negatively affect the water level in Habitat sites:

- The supply of new housing with potable water will require increased abstraction of water from surface water and groundwater bodies. Depending on the level of water stress in the geographic region, this may impact the aquatic conditions in Habitat sites sharing the same catchment.
- The proliferation of impermeable surfaces in urban areas increases the volume and speed of surface runoff, particularly during intense rainfall events. Traditional drainage systems often cannot cope with the volume of stormwater and sewer overflows are designed to discharge untreated water directly into watercourses. Often this pluvial flooding results in downstream inundation of watercourses and larger volumes of water reaching designated sites.

4.19 Increases to the quantity and rate of water delivery can result in summer flooding and prolonged / deeper winter flooding. This in turn results in the reduction of feeding and roosting sites for birds. For example, in areas where water is too deep, most waders will be unable to reach their food sources close to the ground.

4.20 Cardiff adjoins the Severn Estuary SAC / SPA / Ramsar, which is sensitive to changes in the prevailing hydrological regime. The allocation of residential and employment development in the Cardiff Local Plan means that the following Habitat site is at risk regarding changes in water quantity, level and flow:

- Severn Estuary SAC / SPA / Ramsar (stretching along the south-east boundary of the authority).

Water Quality

4.21 The quality of the water that feeds Habitat sites is an important determinant of the condition of the habitats and species they support. Poor water quality can have a range of environmental impacts:

- At high levels, toxic chemicals and metals can result in immediate death of aquatic life, and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour.
- Eutrophication, the enrichment of water with nutrients, increases plant growth and consequently results in oxygen depletion. Algal blooms, which commonly result from eutrophication, increase turbidity and decrease light penetration. The decomposition of organic wastes that often accompanies eutrophication deoxygenates water further, augmenting the oxygen-depleting effects of eutrophication. In the marine environment, nitrogen is the limiting plant nutrient and so eutrophication is associated with discharges containing bioavailable nitrogen.
- Some pesticides, industrial chemicals and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life.

4.22 The most notable issue in relation to the Cardiff LP is the discharge of treated sewage effluent into the Severn Estuary SAC / SPA / Ramsar, which is likely to increase nutrient concentrations in estuarine waters. In local watercourses feeding into the Severn Estuary phosphorus is the main limiting nutrient, whereas nitrogen will be the primary limiting factor in the estuary itself. Since the authority boundary encompasses the SAC / SPA / Ramsar, there is also a risk that surface runoff from impermeable surfaces containing non-toxic and toxic pollutants could directly reach the estuary.

4.23 The LP assessed in this HRA provides for development in the geographic area covered by Welsh Water, responsible for wastewater treatment in Cardiff. The potential ecological implications of LP development are outlined in Table 1.

Table 1: Wastewater Treatment Works (WwTWs) serving residential and employment development in Cardiff that are in potential hydrological continuity with the Severn Estuary SAC / SPA / Ramsar.

WwTW Catchment	Residential and employment development quantum allocated in the Cardiff Local Plan	Potential HRA implications
Cardiff WwTW (operated by Welsh Water)	At least 9,744 net new residential dwellings over the LP period	Discharge of treated sewage effluent into local watercourses that are in hydrological continuity with the estuary Discharge of treated sewage effluent directly into the Severn Estuary SAC / SPA / Ramsar

4.24 The increase in residential and employment development allocated in the LP will lead to an increase in the volume of treated sewage effluent discharged into local waterbodies, including the Severn Estuary. Overall, the following Habitat site within 10km of the Cardiff authority boundary requires further consideration in relation to negative water quality impacts:

- Severn Estuary SAC / SPA / Ramsar (stretching along the south-east boundary of the authority).

Atmospheric Pollution

4.25 The main pollutants of concern for Habitat sites are oxides of nitrogen (NOx), ammonia (NH_3) and sulphur dioxide (SO_2), and are summarised in Table 2. NH_3 can have a directly toxic effect upon vegetation, particularly at close distances to the source such as near road verges[24]. NOx can also be toxic at very high concentrations (far above the annual average Critical Level). However, NOx and NH_3 exert their main impacts on ecosystems via determining the total nitrogen (N) deposition to soils, potentially leading to deleterious knock-on effects. Increases in N deposition from the atmosphere is widely known to enhance soil fertility and leading to eutrophication. This often has adverse effects on community composition and the quality of semi-natural, nitrogen-limited terrestrial and aquatic habitats[25] [26].

Table 2: Main sources and effects of air pollutants on habitats and species[27].

Pollutant	Source	Effects on habitats and species
Sulphur Dioxide (SO_2)	The main sources of SO_2 are electricity generation, and industrial and domestic fuel combustion. However, total SO_2 emissions in the UK have decreased substantially since the 1980's. Another origin of sulphur dioxide is the shipping industry and high atmospheric concentrations of SO_2 have been documented in busy ports. In future years shipping is likely to become one of the most important contributors to SO_2 emissions in the UK.	Wet and dry deposition of SO_2 acidifies soils and freshwater and may alter the composition of plant and animal communities. The magnitude of effects depends on levels of deposition, the buffering capacity of soils and the sensitivity of impacted species. However, SO_2 background levels have fallen considerably since the 1970's and are now not regarded a threat to plant communities. For example, decreases in Sulphur dioxide concentrations have been linked to returning lichen species and improved tree health in London.

[24] http://www.apis.ac.uk/overview/pollutants/overview_NOx.htm.
[25] Wolseley, P. A.; James, P. W.; Theobald, M. R.; Sutton, M. A. **2006.** Detecting changes in epiphytic lichen communities at sites affected by atmospheric ammonia from agricultural sources. *Lichenologist* **38**: 161-176
[26] Dijk, N. **2011.** Dry deposition of ammonia gas drives species change faster than wet deposition of ammonium ions: Evidence from a long-term field manipulation. *Global Change Biology* **17**: 3589-3607
[27] Information summarised from the Air Pollution Information System (http://www.apis.ac.uk/)

Pollutant	Source	Effects on habitats and species
Acid deposition	Leads to acidification of soils and freshwater via atmospheric deposition of SO_2, NOx, ammonia and hydrochloric acid. Acid deposition from rain has declined by 85% in the last 20 years, which most of this contributed by lower sulphate levels. Although future trends in S emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, increased N emissions may cancel out any gains produced by reduced S levels.	Gaseous precursors (e.g. SO_2) can cause direct damage to sensitive vegetation, such as lichen, upon deposition. Can affect habitats and species through both wet (acid rain) and dry deposition. The effects of acidification include lowering of soil pH, leaf chlorosis, reduced decomposition rates, and compromised reproduction in birds / plants. Not all sites are equally susceptible to acidification. This varies depending on soil type, bed rock geology, weathering rate and buffering capacity. For example, sites with an underlying geology of granite, gneiss and quartz rich rocks tend to be more susceptible.
Ammonia (NH_3)	Ammonia is a reactive, soluble alkaline gas that is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but ammonia concentrations are directly related to the distribution of livestock. Ammonia reacts with acid pollutants such as the products of SO_2 and NO_X emissions to produce fine ammonium (NH_4+) - containing aerosol. Due to its significantly longer lifetime, NH_4+ may be transferred much longer distances (and can therefore be a significant trans-boundary issue). While ammonia deposition may be estimated from its atmospheric concentration, the deposition rates are strongly influenced by meteorology and ecosystem type.	The negative effect of NH_4+ may occur via direct toxicity, when uptake exceeds detoxification capacity and via N accumulation. Its main adverse effect is eutrophication, leading to species assemblages that are dominated by fast-growing and tall species. For example, a shift in dominance from heath species (lichens, mosses) to grasses is often seen. As emissions mostly occur at ground level in the rural environment and NH_3 is rapidly deposited, some of the most acute problems of NH_3 deposition are for small relict nature reserves located in intensive agricultural landscapes.
Nitrogen oxides (NO_x)	Nitrogen oxides are mostly produced in combustion processes. Half of NO_X emissions in the UK derive from motor vehicles, one quarter from power stations and the rest from other industrial and domestic combustion processes. Nitrogen oxides have been consistently falling for decades due to a combination of coal fired power station closures, abatement of other combustion point sources and improved vehicle emissions technology. They are expected to continue to fall over the plan period.	Direct toxicity effects of gaseous nitrates are likely to be important in areas close to the source (e.g. roadside verges). A critical level of NOx for all vegetation types has been set to 30 ug/m3. Deposition of nitrogen compounds (nitrates (NO_3), nitrogen dioxide (NO_2) and nitric acid (HNO_3)) contributes to the total nitrogen deposition and may lead to both soil and freshwater acidification. In addition, NO_x contributes to the eutrophication of soils and water, altering the species composition of plant communities at the expense of sensitive species.
Nitrogen deposition	The pollutants that contribute to the total nitrogen deposition derive mainly from oxidized (e.g. NO_X) or reduced (e.g. NH_3) nitrogen emissions (described separately above). While oxidized nitrogen mainly originates from major conurbations or highways, reduced nitrogen mostly derives from farming practices. The N pollutants together are a large contributor to acidification (see above).	All plants require nitrogen compounds to grow, but too much overall N is regarded as the major driver of biodiversity change globally. Species-rich plant communities with high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication. This is because many semi-natural plants cannot assimilate the surplus N as well as many graminoid (grass) species.

Pollutant	Source	Effects on habitats and species
		N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.
Ozone (O_3)	A secondary pollutant generated by photochemical reactions involving NOx, volatile organic compounds (VOCs) and sunlight. These precursors are mainly released by the combustion of fossil fuels (as discussed above). Increasing anthropogenic emissions of ozone precursors in the UK have led to an increased number of days when ozone levels rise above 40ppb ('episodes' or 'smog'). Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.	Concentrations of O_3 above 40 ppb can be toxic to both humans and wildlife, and can affect buildings. High O_3 concentrations are widely documented to cause damage to vegetation, including visible leaf damage, reduction in floral biomass, reduction in crop yield (e.g. cereal grains, tomato, potato), reduction in the number of flowers, decrease in forest production and altered species composition in semi-natural plant communities.

4.26 SO_2 emissions overwhelmingly derive from power stations and industrial processes that require the combustion of coal and oil, as well as shipping (particularly on a local scale)[28]. NH_3 emissions primarily originate from agricultural practices[29], with some chemical processes and some vehicles (notably petrol cars) also making notable contributions.

4.27 In contrast, NOx emissions are dominated by the output of vehicle exhausts (more than half of all emissions). A 'typical' housing development will contribute by far the largest portion to its overall NOx footprint (92%) through its associated road traffic. Other sources, although relevant, are of minor importance (8%) in comparison[30]. Therefore, the emerging LP, which will increase the population of Cardiff, can be reasonably expected to increase emissions of NOx and NH_3, and thus total N deposition through an increase in vehicular traffic.

4.28 According to the World Health Organisation, the critical NOx concentration (Critical Level) for the protection of vegetation is 30 μgm^{-3}; the threshold for sulphur dioxide is 20 μgm^{-3}. In addition, ecological studies have determined Critical Loads (CLs) [31] for atmospheric nitrogen deposition (that is, NOx combined with NH_3).

4.29 According to the Department of Transport's Transport Analysis Guidance, beyond 200m, the contribution of vehicle emissions from the roadside to local pollution levels is insignificant (Figure 1 and see reference [32]). Therefore, this is the distance that is used in this HRA to identify major commuter routes along Habitat Sites, which are likely to be significantly affected by development outlined in the LP.

[28] http://www.apis.ac.uk/overview/pollutants/overview_SO2.htm.
[29] Pain, B.F.; Weerden, T.J.; Chambers, B.J.; Phillips, V.R.; Jarvis, S.C. 1998. A new inventory for ammonia emissions from U.K. agriculture. *Atmospheric Environment* **32**: 309-313
[30] Proportions calculated based upon data presented in Dore CJ et al. 2005. UK Emissions of Air Pollutants 1970 – 2003. UK National Atmospheric Emissions Inventory. http://www.airquality.co.uk/archive/index.php
[31] The critical load is the rate of deposition beyond which research indicates that adverse effects can reasonably be expected to occur
[32] http://www.dft.gov.uk/webtag/documents/expert/unit3.3.3.php#013; accessed 12/05/2016

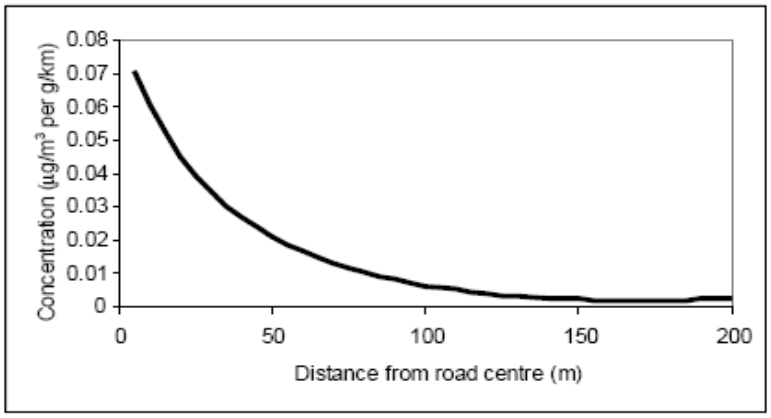


Figure 1: Traffic contribution to concentrations of pollutants at different distances from a road (Source: DfT[33]).

4.30 The following Habitat designated sites are vulnerable to atmospheric pollution arising from urban growth resulting from the Plan either alone or 'in-combination' with other plans and projects:

- Severn Estuary SAC/SPA/Ramsar (stretching along the south-east boundary of the authority);
- Cardiff Beech Woods SAC (situated in the north of the authority).

Coastal Squeeze

4.31 Coastal squeeze is a well-established process that results in the net contraction and eventual disappearance of intertidal habitats, which may be designated features themselves and / or critical supporting habitats for SPA / Ramsar waders and waterfowl. Specifically, this impact pathway is facilitated by brownfield development immediately inland from the coastline, which results in intertidal habitat loss by preventing the landward migration of these habitats in response to sea level rise. The published literature[34] provides the following definition of coastal squeeze: '*the loss of natural habitats or deterioration of their quality arising from anthropogenic structures or actions, preventing the landward transgression of those habitats that would otherwise naturally occur in response to sea level rise in conjunction with other coastal processes. Coastal squeeze affects habitat on the seaward side of existing structures.*' Several modelling studies on the implications of coastal squeeze have been undertaken. For example, provided that no additional space for accommodating sea level rise is provided (e.g. through nature-based coastal management approaches and Managed Realignment), a global loss of coastal wetland up to 30% is forecast to 2100[35]. A study comparing armoured and unarmoured coastal segments determined that defended coasts lacked dry upper beach zones and comprised narrower mid-beach zones. Furthermore, areas with frontline defences were also characterised by lower abundance, biomass and size of upper intertidal macroinvertebrates, and lower abundance and species richness of shorebirds[36].

4.32 Given the increasing density of urban development along coastlines, which interferes with natural adaptive processes of coastal habitats, coastal squeeze is becoming an increasingly important consideration in the HRA process. The approaches for coastal management are typically set at the strategic level in Shoreline Management Plans (SMPs) and Coastal Management Strategies (CMS). While being bound under the Habitats and Species Regulations 2017 (as amended), Local Planning Authorities are also legally required to protect important human receptors, including homes, businesses and critical infrastructure (e.g. roads and railway lines). These objectives may be conflicting, which means that in many instances protection of coastal assets cannot be achieved without adverse effects on site integrity. Clearly, the development allocated in the Cardiff LP would constitute important human assets in close proximity to the coastline and its protection would be identified in the overarching SMP / CMS.

[33] http://www.dft.gov.uk/ha/standards/dmrb/vol11/section3/ha20707.pdf; accessed 13/07/2018
[34] Environment Agency. (February 2021). Flood and Coastal Erosion Risk Management Research and Development Programme. Available at: https://www.gov.uk/flood-and-coastal-erosion-risk-management-research-reports/what-is-coastal-squeeze#:~:text=Coastal%20squeeze%20is%20now%20defined,conjunction%20with%20other%20coastal%20processes [Accessed on the 01/08/2022]
[35] Schuerch M, Spencer T, Temmerman S, Kirwan ML, Wolff C, Lincke D, McOwen CJ, Pickering MD, Reef R, Vafeidis AT, Hinkel J, Nicholls RJ & Brown S. (2018). Future response of global coastal wetlands to sea-level rise. *Nature* **561**: 231-234.
[36] Dugan JE, Hubbard DM, Rodil IF, Revell DL & Schroeter S. (2008). Ecological effects of coastal armoring on sandy beaches. *Marine Ecology* **29**: 160-170.

4.33 The following Habitat designated sites are vulnerable to coastal squeeze resulting from the Plan either alone or 'in-combination' with other plans and projects:

- Severn Estuary SAC/SPA/Ramsar (stretching along the south-east boundary of the authority);

5. Test of Likely Significant Effects

Direct loss of habitat

Cardiff Beech Woods SAC

5.1 In their comments on the previous iteration of the Local Plan Natural Resources Wales noted that there are multiple active quarries around Cardiff Beechwoods SAC and that an extension to the current quarrying operations has been granted under the Review of Mineral Permissions. Policy MW1: Mineral Limestone Reserves and Resources safeguards several quarries that are already consented.

5.2 However, there are no further planning applications to extend the lateral extent of the four quarries around the Cardiff Beechwoods SAC and no proposals for such in the Local Plan. There are current planning applications to deepen Taffs Wells Quarry by a further 2 benches to 30m AOD and extend the life of the current permission for the smaller Ton Mawr quarry to end of 2042 but these are both within the current quarry extraction area. Therefore, there should be no habitat loss or associated impacts from Cardiff Beech Woods SAC due to proposals in the Local Plan. Therefore, no likely significant effects will result.

Recreational Pressure

Severn Estuary SAC / SPA / Ramsar

5.3 Due to the growing population and a trend towards spending an increased amount of time outdoors, recreational pressure is one of the most widely documented impacts in Habitat sites. The Severn Estuary SAC / SPA / Ramsar is sensitive to recreational pressure as identified in Natural England's Site Improvement Plan (SIP): '*Public access and recreation may have an impact on bird species sensitive to disturbance, causing displacement from feeding, roosting and moulting areas, and if severe could affect long term survival and population numbers and distributions within the Estuary.*' This is affirmed in the joint CCW (now NRW) and Natural England advice note on the Severn Estuary EMS, which states that '*there is intermittent disturbance to the internationally important migratory species and the waterfowl assemblage from both the landward and seaward side of the site which has increased in recent years, due to the estuary becoming more populated and the development of all weather recreational pursuits. All supporting habitats are currently* ***highly vulnerable*** *to noise and visual disturbance.*' Pressure in the estuary arises from a diverse number of recreational activities, including dog walking, walking, horse-riding, cycling, beach activities, angling, wildfowling and water-based sports. The SIP already specifies an action of developing a strategic approach to visitor management, including appropriate zonation to protect currently undisturbed areas and management plans for major recreational beaches.

5.4 The authority of Cardiff adjoins the Severn Estuary SAC / SPA / Ramsar, such that future residents of housing to be allocated in the LP will have short travel times to the site. It should be noted that most parts of south and south-west Cardiff are highly developed and unlikely to be significant recreation destinations. However, direct access to the estuarine foreshore (Cardiff Flats) is possible in the south-east of the authority in an area surrounding Pengam. **Overall, LSEs of the Cardiff LP on the Severn Estuary SAC / SPA / Ramsar regarding recreational pressure cannot be excluded and the site is screened in for AA.**

Cardiff Beech Woods SAC

5.5 The Cardiff Beech Woods SAC is designated for two woodland types, including *Asperulo-Fagetum* beech forest and *Tilio-Acerion* forest of slopes, screes and ravines. Both woodlands are sensitive to impacts from recreational access, albeit from different types of activities. The beech forest lies on moderately sloping ground that attracts a wide range of activities, including dog walking, walking, cycling and horse riding. In

contrast, *Tilio-Acerion* forest is characterised by much steeper gradients and attracts more specialist niche activities such as rock climbing, scrambling and mountain-biking.

5.6 Trees in woodland are primarily sensitive to trampling-related impacts, including continued abrasion of exposed roots and soil compacting. For example, increased footfall around sensitive root zones reduces the number and extent of pore spaces for water and nutrient storage. This can reduce the ability of trees to absorb essential nutrients from the soil. Furthermore, the high proportion of dog walkers in many Habitat sites represents an issue in relation to nutrient deposition in dog faeces and urine, an impact that is comparable to the application of agricultural fertilisers. Excessive inputs of nutrients to Habitat sites can lead to long-term changes in community composition, such as woodland ground flora. Generally, habitats of conservation importance are characterised by diverse plant assemblages that tend to be replaced by graminoids under high nutrient regimes. The management plan for the SAC specifically identifies recreational pressure as being a concern. **Overall, given that the Cardiff Beech Woods SAC lies close to many residential areas in the north of the authority, LSEs of the Cardiff LP on the SAC regarding recreational pressure cannot be excluded and the site is screened in for AA.**

Loss of Functionally Linked Land

Severn Estuary SPA / Ramsar

5.7 The qualifying waterfowl and wader species in the Severn Estuary SPA / Ramsar are mobile and routinely travel beyond the designated site boundary. Natural England's SIP for the Severn Estuary highlights the importance of modifications to offsite environments for SPA bird distributions. The dependence on functionally linked habitats varies considerably between species, but the Severn Estuary SPA / Ramsar is designated for several species that are known to regularly forage / roost outside designated sites (e.g. Bewick's swan, white-fronted goose, redshank and several species in the qualifying waterbird assemblage).

5.8 A review of satellite imagery indicates that a large portion of south Cardiff is developed and industrialised, thus having limited potential for constituting functionally linked habitat. Only very few locations (e.g. Pengam Green) adjoining the Severn Estuary SPA / Ramsar comprise suitable supporting habitats for qualifying birds. With its focus on urban regeneration and 'brownfield-first' development, it is unlikely that the Cardiff LP will be allocating the few remaining greenfield sites. Notwithstanding this, without examining allocations it cannot be excluded that (a) SPA / Ramsar birds are using suitable land parcels in the southern part of the authority and (b) some such sites might be allocated in the LP. **Therefore, LSEs of the Cardiff LP on the Severn Estuary SPA / Ramsar regarding the loss of functionally linked habitat cannot be excluded and this impact pathway is screened in for AA.**

Water Quality

Severn Estuary SAC / SPA / Ramsar

5.9 All qualifying habitats and species in the Severn Estuary SAC / SPA / Ramsar have specific water quality requirements and could be negatively impacted by a reduction in water quality. The theme of water quality encompasses a wide range of physico-chemical parameters, including temperature, salinity, oxygen, nutrient concentrations, pH and turbidity. NRW and Natural England advice on the 'estuaries' feature in the Severn Estuary EMS stipulates that '*changes in any of the physico-chemical parameters in the water column can impact on the quality of the estuary habitat and hence could lead to changes in the presence and distribution of species…*' Negative changes in water quality may alter the typical assemblages of freshwater and vascular plant species that is found within the water column and / or saltmarsh habitat. For example, high nutrient concentrations are a well-established consequence of urbanisation, which fuel phytoplankton biomass and diversity, as well as macroalgal cover / density. Eutrophication, the unchecked growth of algae, is associated with a series of knock-on impacts, including high turbidity, low DO concentration and, ultimately, death of invertebrates and fish.

5.10 Changes in water quality, and particularly in nutrient loading, can result in indirect impacts on qualifying SPA / Ramsar birds. As highlighted above, nutrient enrichment can change plant community composition in saltmarsh, which in turn may reduce the ability of certain bird species to forage on the sward. Excessive nutrient loadings on mudflats can lead to excessive algal growth, making it more difficult for waders to access preferred food items and changing invertebrate species composition in the sediment. According to

the EMS advice note, the intertidal sand- and mudflats in the estuary are considered to be 'moderately vulnerable' to eutrophication processes. **The available evidence suggests that LSEs of the Cardiff LP on the Severn Estuary SAC / SPA / Ramsar regarding water quality cannot be excluded and the site is screened in for AA.**

Water Quantity, Level and Flow

Severn Estuary SAC / SPA / Ramsar

5.11 Being an estuarine ecosystem, the Severn Estuary SAC / SPA / Ramsar is sensitive to changes in water flow rates. For example, the condition and quality of many SAC habitats depends on the intricate flux of freshwater and seawater inputs. The characteristic zonation patterns in Atlantic salt meadows depend on adequate water flow rates to maintain optimum sediment supply. While a degree of sediment deposition is needed for healthy saltmarsh communities, a high reduction in water flow rates may lead to heavy sedimentation and subsequent smothering of qualifying communities. Changes in water flow rates can also lead to salinity being outside the optimum requirements for saltmarsh. For example, reduced freshwater inflow is typically associated with increased salinity, which can result in shifts in the characteristic zonation pattern of sward assemblages.

5.12 It is unlikely that alterations in water flow will be impacting SPA / Ramsar species directly. However, changes in the supply of freshwater to the estuary may have marked indirect effects on qualifying birds through impacts on supporting habitats. Excessive shifts in water flow rates affect essential abiotic parameters in foraging / roosting habitats (e.g. DO, turbidity, temperature, salinity, etc.) that in turn shape plant and invertebrate communities. Effects on the suitability of supporting habitats may affect the long-term survival of individuals and distributions of birds. CCW and Natural England advice on the Severn Estuary EMS identifies that all supporting habitats for SPA / Ramsar birds have 'high vulnerability' to changes in water flows.

5.13 The Cardiff LP allocates 9,744 net new dwellings and an unspecified quantum of employment development, all of which will need to be supplied with potable water. Furthermore, the LP will also lead to a proliferation of impermeable surfaces in proximity to the Severn Estuary SAC / SPA / Ramsar. **The available evidence suggests that LSEs of the Cardiff LP on the Severn Estuary SAC / SPA / Ramsar regarding water quantity, level and flow impacts cannot be excluded and the site is screened in for AA.**

Atmospheric Pollution

Severn Estuary SAC / SPA / Ramsar

5.14 By delivering net new dwellings and employment development, the Cardiff LP will likely lead to increased mobility patterns within and outwards from the authority. While electric vehicle usage is growing, it is likely that a large proportion of the increase in commuter journeys will be undertaken in fossil-fuelled vehicles. Atlantic saltmarsh is the only qualifying habitat within the Severn Estuary SAC that is sensitive to atmospheric nitrogen deposition. APIS identifies a CL of 20-30 kg N/ha/yr for saltmarsh, exceedance of which is likely to result in shifts in sward community composition. While estuarine habitats are naturally tolerant to fluctuations in nutrient loadings, excessive nitrogen deposition may lead to the replacement of characteristic saltmarsh species by graminoids. The Severn Estuary SAC extends along industrial development and various roads in the south-east of Cardiff, many of which lie within 200m of the site. **Overall, given the sensitivity of the site to nitrogen deposition and its situation in extensively developed south Wales, LSEs of the Cardiff LP on the Severn Estuary SAC regarding atmospheric pollution cannot be excluded. The SAC is screened in for AA in relation to this impact pathway.**

5.15 The Severn Estuary SPA / Ramsar is designated for several species of waders and waterfowl, which all depend on SAC supporting habitats within the site boundary. Birds are not directly sensitive to nitrogen deposition, but potential indirect atmospheric pollution effects could occur through impacts on supporting habitats. While greylag goose, redshank and shelduck all utilise various zones in saltmarsh (the only supporting habitat that is sensitive to atmospheric nitrogen deposition), APIS identifies these species as not being sensitive to atmospheric nitrogen impacts. This is because some species (e.g. redshank) may actually benefit from increased prey abundance under elevated nutrient regimes (notwithstanding a likely

reduction in species diversity). Therefore, in line with the available evidence on APIS, potential atmospheric pollution impacts on the Severn Estuary SPA / Ramsar are screened out from AA.

Cardiff Beech Woods SAC

5.16 Housing and employment growth allocated in the Cardiff LP will result in higher commuter traffic flows within the city, as well as increased traffic exchanges with adjoining authorities. The Cardiff Beech Woods SAC, situated in the north of the authority near the Morganstown and Coryton suburbs, is designated for two woodland habitats (*Asperulo-Fagetum* beech forests and *Tilio-Acerion* forests of slopes, screes and ravines. Like many habitats of conservation importance, woodlands are sensitive to atmospheric nitrogen deposition particularly due to impacts on their associated ground flora and bryophyte / lichen assemblages. APIS specifies nitrogen CLs for beech forest and *Tilio-Acerion* forest of 10-20 kg N/ha/yr and 15-20 kg N/ha/yr respectively. Furthermore, since bryophytes and lichens are integral to beech forest ecosystems, a Critical Level for NH_3 of 1 µg/m^3 is established for *Asperulo-Fagetum* beech forest.

5.17 The Cardiff Beech Woods SAC lies in the north of the authority near dense housing development and the A470, a strategic transport corridor connecting Cardiff to the adjoining authority of Rhondda Cynon Taf and Caerphilly. Furthermore, the A470 also provides access for local residents to the M4, a strategic transport corridor providing connectivity on an east-west axis towards south England. **Given the sensitivity of the site to atmospheric pollution and its location in relation to the road network, LSEs of the Cardiff LP on the Cardiff Beech Woods SAC regarding atmospheric pollution cannot be excluded. The site is screened in for AA in relation to this impact pathway.**

Coastal Squeeze

Severn Estuary SAC / SPA / Ramsar

5.18 The Severn Estuary SAC is designated for intertidal sand- and mudflats, and Atlantic salt meadows. The ecological integrity of these habitats depends on regular inundation by seawater followed by temporary exposure to air. Due to the impacts of climate change, sea levels are predicted to rise considerably in the future, resulting in the prolonged submergence of Atlantic salt meadows. Along undefended and undeveloped stretches of coastline, intertidal habitats would typically 'respond' by retreating inland in line with sea level rise. However, in heavily engineered environments like southern Cardiff, coastal defences and brownfield sites prevent landward migration, resulting in the gradual loss of intertidal habitats. Furthermore, qualifying birds in the overlapping SPA / Ramsar that rely on intertidal mudflats or saltmarsh for foraging are under considerable risk of losing essential supporting habitat.

5.19 Natural England's SIP for the English section of the Severn Estuary specifies coastal squeeze as an important pressure / threat to the integrity of the SAC / SPA / Ramsar: '*As sea levels rise, man-made defences are constraining the natural roll back of estuarine habitats, causing squeeze and loss of habitat and having impacts on species dependant upon those habits (birds: feeding / roosting, and fish: feeding / nursery and shelter areas)*.' The CCW and Natural England advice note on the Severn Estuary EMS also indirectly refers to the process of coastal squeeze by stating that '*the intertidal mudflats and sandflats and the saltmarsh are highly sensitive to removal by land reclamation and major construction activities.*' **Overall, it is considered that LSEs of the Cardiff LP on the Severn Estuary SAC / SPA / Ramsar regarding coastal squeeze cannot be excluded. A more detailed assessment of the existing coastal management approaches along the Cardiff shoreline is required in the AA.**

Screening of Local Plan Policies

5.20 A screening assessment of the LP policies is undertaken in Appendix B. It was concluded that LSEs cannot be excluded in relation to the following policies that are taken forward to the AA:

- Policy SP1 (Providing for Sustainable Growth) – the policy provides for sustainable growth across the authority, including 26,400 new dwellings and 32,300 new jobs over the LP period;
- Policy SP2 (Sustaining Economic Growth and Resilience) – the policy provides for an unspecified range and quantum of employment types in different geographic locations across Cardiff;

- Policy SP9 (Supporting the Role of Cardiff Port) – the policy supports the role of Cardiff Port in the overall economy of the authority by specifying the employment types (port-specific, industrial, logistical and leisure uses) that will be allowed in the policy area;
- Policy SP10 (Tourism) – the policy supports sustainable tourism developments across Cardiff City, including several specific proposals such as a new 17,000 seater indoor arena in Cardiff Bay, redevelopment of the Quay area and Canal Quarter, and a new velodrome in the Sports Village; and
- Policy SP18 (Securing New Transport Infrastructure) – the policy secures new transportation infrastructure projects across Cardiff, via transportation improvements in various travel Corridors (e.g. North West, North and South East, South West and North).
- Policy H1A (Strategic Housing Sites) – the policy allocates land for the provision of 1,675 new dwellings
- Policy H1B (Non-Strategic Housing Sites) – the policy allocates land for the provision of 240 new dwellings
- Policy H2 (Housing Led Regeneration Sites) – the policy designates certain areas as housing led regeneration areas which are either vacant, under used or the subject of redevelopment proposals, or have future potential to provide an opportunity for high density, sustainable, mixed - use development
- Policy H11 (Gypsy and Traveller Site) – The policy allocates land for a new Gypsy and Traveller site which is anticipated to provide approximately 80 pitches.
- Policy EC2 (Land South of St Mellons Business Park) - The policy allocates land for a strategic employment site comprising up to 90,000 square metres of B1, B2 and B8 uses, ancillary uses and infrastructure associated with; biodiversity; landscape; drainage; walking, cycling and other transport modes. together with the construction of a new transport hub facility, and associated infrastructure works.

5.21 A screening assessment of the LP allocations is also undertaken in Appendix B It was concluded that LSEs cannot be excluded in relation to the following allocations that are taken forward to the AA:

- SH1.1 – Land at Church Farm (Part of adopted LDP Strategic Site F)
- SH1.2 – Land south of the M4 Motorway, West of Rudry Road, Lisvane (Part of the adopted LDP Strategic Site F)
- SH1.3 – Land to the north of Ty-Draw Road (Part of adopted LDP Strategic Site F)
- SH1.4 – Land south of Llantrisant Road (Part of adopted LDP Strategic Site D)
- SH1.5 – Land at Llantrisant Road (A4119) (Part of adopted LDP Strategic Site D)
- SH1.6 – Land at Llwynioli Farm (Part of adopted LDP Strategic Site D)
- SH1.7 – Former Gas Works, Ferry Road
- H1.1 – Land at areas 9-12, St Mellons
- H1.2 – Rookwood Hospital Canton

6. Appropriate Assessment

Recreational Pressure

Severn Estuary SPA / Ramsar / SAC

6.1 As highlighted in the LSEs screening chapter, the Severn Estuary SPA / Ramsar / SAC is sensitive to impacts from recreational pressure. Policy SP1 (Providing for Sustainable Growth) identifies a need for 26,400 dwellings over the RLDP period, which will result in an increase of Cardiff's population of approx. 18,336 additional residents. This will result in an increased demand for recreational greenspaces. It should also be noted, however, that although Cardiff has a requirement of 26,400 dwellings, 20,377 of these can be met by existing commitments (i.e. dwellings with planning permission) and completions. The remainder consists of a net windfall (development on unallocated sites) allowance of 3,078 and 6,666 net new dwellings spread across 7 allocated strategic sites, 2 allocated non-strategic sites, and 7 housing led regeneration areas. This is a total of 9,744 net new dwellings that do not already have planning consent.

6.2 Advice for the Severn Estuary European Marine Site (EMS) issued by Natural England and the Countryside Council for Wales (CCW, now Natural Resources Wales) specifies that there should be no significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline. Furthermore, the EMS advice states that '*significant disturbance attributable to human activities can result in reduced food intake and / or increased energy expenditure. Five year peak mean information on populations will be used as the basis for assessing whether disturbance is damaging.*' The five-year peak mean data on the BTO Wetland Bird Survey (WeBS) website indicates that overwintering bird populations have increased from 76,496 between 2010/11 and 2014/15 to 85,643 between 2015/16 and 2019/20. Therefore, on the basis of currently available bird data, there is no evidence that recreational pressure was having a deleterious effect on the qualifying SPA / Ramsar population up to 2020. However, this is not to guarantee that a further spike in recreational visits would not lead to a population-level impact on overwintering bird species. Moreover, the WeBS overall count data details with bird numbers in total and may mask variations in individual species abundance.

6.3 The Severn Estuary SPA / Ramsar / SAC adjoins the authority along its south-east boundary, providing ample opportunities for access along the shoreline and, potentially, to intertidal sand- and mudflats. Furthermore, the Wales Coast Path, a long-distance hiking trail, runs alongside the edge of the Habitat site boundary for large stretches within the authority. Well-established regional trails may have additional draws on people due to their scenic nature, varied habitats and good signposting. There are several small settlements (e.g. Pengam, Trowbridge, Newton, Cardiff Bay) in walking distance to the Severn Estuary and it is to be expected that additional dwellings in these locations would lead to additional frequent and repeat visits to the Habitat site, particularly by dog walkers. Regarding the Severn Estuary SPA / Ramsar / SAC, delivery of additional housing in the south-east part of the authority will be more impactful than focussing growth in the central, western and northern part of Cardiff. Travel distance is the main parameter in determining the likelihood of future residents to visit a site which, in combination with the attractiveness of the estuary for recreation, would make it unlikely for future residents to visit elsewhere.

Existing Evidence Base

6.4 The Severn Estuary SPA / Ramsar is a destination with a unique funnel shape, meaning that it runs diagonally along several authorities, including Forest of Dean, Stroud, Monmouthshire and Cardiff. Due to its scenery and geography, the site is likely to have a unique recreational draw on residents in the adjoining authorities and, given that the likelihood of visiting a site decreases with distance from home, residents are likely to visit stretches of the estuary with suitable access points that are closest to home. No visitor data on access points within Cardiff is available. However, Footprint Ecology undertook a visitor survey in Lydney (Forest of Dean) in 2017 to inform a recreation strategy for that part of the estuary[37]. A visitor survey was also undertaken by EPR in 2016 for the part of the SPA / Ramsar within Stroud District[38]. Furthermore, the Association of Severn Estuary Relevant Authorities (ASERA) published a

[37] Liley D., Panter C. & Hoskin R. 2017. Lydney Severn Estuary Visitor Survey and Recreation Strategy. Unpublished report by Footprint Ecology for the Forest of Dean District Council. 55pp. Available at: https://www.footprint-ecology.co.uk/reports/Liley%20et%20al%202017%20Lydney%20Severn%20Estuary%20Visitor%20Survey%20and%20Recreation%20Strategy.pdf [Accessed on the 31/10/2019]

[38] Southgate J. & Colebourn K. 2016. Severn Estuary (Stroud District) Visitor Survey Report. Report for Stroud District Council. Ecological Planning & Research, Winchester. 68pp. Available at: https://www.stroud.gov.uk/media/2902/severnestuaryvs_report_15581c_final_060616.pdf [Accessed on the 31/10/2019]

comprehensive overview of recreational boating in the estuary[39]. Surveys have also been undertaken on the Welsh side of the estuary for Monmouthshire and Torfaen Councils. These surveys were conducted to establish a baseline of existing recreational pressure in the relevant parts of the SPA / Ramsar, and to assess the potential impacts of residential growth in the respective authorities. Due to the unique shape of the estuary, the data from these surveys are not directly relevant to Cardiff, illustrated by the fact that the surveys did not capture visitors from Cardiff (likely due to the presence of stretches of the SPA / Ramsar much closer to home). Nevertheless, they do show that Cardiff lies well within the core recreational catchment of the SAC / SPA / Ramsar and some of the patterns of visitor use highlighted in these surveys are likely to be similar in Cardiff (for example, the high proportion dog walkers constitute of the total recreational burden) and are therefore discussed in the following. Furthermore, the visitor management interventions discussed in Footprint Ecology's recreation strategy provide useful context and potential guidance on mitigation measures that may be needed in relation to the Cardiff RLDP.

Recreational boating

6.5 Water-based activities are likely to be particularly disturbing to overwintering birds because they may bring visitors closer to sensitive areas, such as roosts or foraging sites. Furthermore, the infrastructure associated with boating activities (e.g. moorings) is known to be particularly damaging to benthic habitats, leading to erosion, abrasion and sediment displacement (although the latter is more relevant to the Severn Estuary SAC). The Association of Severn Estuary Relevant Authorities (ASERA) published a study of water-based recreation in the Severn Estuary EMS (which covers parts of the SPA / Ramsar / SAC designation) in 2016. It summarises the key environmental impacts of boating, gives an overview of current boat usage trends and suggests steps for managing water-based activities. Boats generally access the estuary using 35 launching and access points (31 slipways and four sets of locks). Of these, eight slipways and one lock system are located in Cardiff Bay. The Cardiff Barrage comprises three sets of locks, which can handle up to 400 boat movements per day during busy periods. Most slipways are owned or managed by recreational boat clubs and usage of slipways is restricted to club members or requires prior permission for non-members. Very popular slipways, such as those in Cardiff Bay, are managed through a permit system. These broad management systems are important because they inherently limit the peak number of boat users in the estuary at any one time.

6.6 The RYA identified indicative boating routes of varying levels of intensity in their UK Coastal Atlas of recreational Boating (2008). Cardiff Bay is a key focal area for routes with heavy recreational use, with at least six or more boats at all times on summer days. In particular, the cruising route between Cardiff Bay and Portishead Marina is one of the most popular routes in the estuary with an average of around 30 boats a day passing through the Cardiff Bay Barrage. Interestingly, and perhaps counterintuitively, the peak month for boats in Cardiff Bay is April (1,234) and the peak boat number per day occurs in November (195).

6.7 Most disturbance impacts from water-based recreation are likely to be temporary (with birds ceasing foraging and moving to less disturbed areas, but then returning to their roosting / feeding ground). However, if prolonged disturbance impacts are present, this may result in permanent displacement, often to sub-optimal foraging habitats. Disturbance is likely to be biggest where the rapid movement of boats across the water is accompanied by loud noises (e.g. powerboating, water-skiing, jet-skiing). Generally, recreational boating is unlikely to be of concern in the open water, but rather in proximity to intertidal zones and important bird roost sites. Another main risk is associated with disturbance from intermittent activity at landing and launching points in close proximity to intertidal habitats.

6.8 However, overall the RYA report concluded that recreational boating is unlikely to be causing significant disturbance to foraging and roosting overwintering birds for the following reasons:

- Seasonal separation between peak recreational boating use and peak bird use between October and March;
- Tidal separation between boat usage (frequently restricted to high tides when intertidal mudflats are unavailable for birds) and foraging periods;
- Infrequent and temporary exposure to boating on the winter days where this does occur (likely to a maximum of four hours in any 24 hour period); and

[39] Association of Severn Estuary Relevant Authorities. (November 2016). Recreational boating in the Severn Estuary. 85pp. Available at: https://asera.org.uk/wp-content/uploads/sites/3/2016/11/ASERA-Water-Based-Recreation-Report-Nov-2016-Low-Res2.pdf [Accessed on the 04/04/2023]

- High levels of disturbance from other sources (e.g. dog walkers, people wildfowling, port and shipping operations) particularly near busy cities will mean that many birds will have already habituated to human activity.

6.9 To minimise the negative impacts of water-based activities, education management tools are in place in the estuary. The RYA's approach relies on the principle that education is often more effective than regulation. It runs courses that provide resources and practical advice on a range of environmental topics, which are completed by more than 155,000 people per year. The Green Blue, a partnership between the RYA and British Marine, has published a series of guides and factsheets with the aim to raise awareness among the industry and recreationists. For example, Fact Sheet 1 discusses the effects of boating and watersports on wildlife, with the aim to generate awareness of overwintering birds. As part of the UK Marine SACs Project, good practice guidelines were developed for recreation activities in European Marine Sites to promote good behaviour towards the environment.

Lydney visitor survey

6.10 The Lydney visitor survey covered the four main access points to the part of the Severn Estuary SPA / Ramsar / SAC closest to Lydney, the proposed location of new development. Across all survey points the total number of people entering the wider area was 153, equating to an hourly rate of 9.6 people entering the area around the estuary. Of 83 interviewees, 36 visitors (43%) undertook dog walking and 14 visitors (17%) were walking. Boating was undertaken by 5 interviewees (6%). While visit duration was similarly short (mostly between 30 minutes and 1 hour) for all activities (except boating), dog walking was the recreational activity that involved the highest proportion of frequent visits, with a total of 41% of dog walkers visiting daily or most days (180+ visits per year). Most importantly, the visit patterns of dog walkers, walkers and joggers, highlight that visitors tend to live very close to the SAC. For example, dog walkers travel a median distance of 2.3km to their access points (typically on foot), highlighting the potential significance of new nearby residential development. Overall, the Lydney survey highlights that the Severn Estuary SPA / Ramsar / SAC is subject to regular disturbance by particular user groups, especially dog walkers, which are generally considered to have the biggest disturbance impact on SPA / Ramsar features.

Stroud visitor survey

6.11 EPR's Stroud visitor survey focussed on the upper section of the Severn Estuary SPA / Ramsar / SAC, closer to where the River Severn transitions into the Severn Estuary. It surveyed nine access points to the estuary, which were either parking locations or Public Right of Ways (PRoWs) providing direct access on to the estuary. Overall, 461 people accessed the area over two days at all access points, resulting in an access rate of 30.7 people per hour. 185 dogs were recorded across all access points over the two-day survey period, resulting in an average of 12.3 dogs per hour. 51.6% of the groups interviewed had at least one dog with them, which is slightly less than observed at other marine sites such as the Solent (53%) and North Kent (65%). The average (mean) distance travelled by visitors to reach their access point was 14.5km. Visitors arriving on foot, i.e. the local residents, had travelled an average of 5.4km. Importantly, the study also provided a visitor catchment for the Severn Estuary SPA / Ramsar / SAC, which uses the standard 75th percentile of distances travelled by visitors to define a core recreational catchment. Interestingly, and in contrast to Lydney, where visitors travel very short distances to access points, the estuary in Stroud has an indicative recreational catchment of 17.7km (all visitors) and 7.7km (Stroud residents only). The main reason for this disproportionately large catchment is most likely due to the low housing density in this part of the authority, which is significantly lower than in other areas of the UK (e.g. the Solent).

Monmouthshire and Torfaen visitor survey

6.12 The Monmouthshire RLDP makes provision for 8,366 new dwellings over the plan period, including the Strategic Growth Areas of Chepstow and Severnside. A considerable portion of this housing will be delivered within a 1km walking distance from the estuary, such that the RLDP is likely to increase the recreational burden within the SPA / Ramsar / SAC considerably. Based on a recommendation by AECOM, Monmouthshire Council and Torfaen Council (the latter authority also progressing their RLDP inclusive of housing growth) jointly commissioned a visitor survey at four access points (covering both parking and foot access locations) to provide the first in-combination visitor data along the Welsh part of the estuary. This has been published as part of the HRA of the Deposit Monmouthshire Local Plan.

6.13 The visitor count at surveyed locations ranged between 127 (Caldicot Coast Path, foot access only) and 613 (RSPB Newport Wetlands, large car park available at the RSPB site) people over two survey days, indicating that the estuary in Wales is busier than some of its parts surveyed in England (e.g. in Lydney

the busiest location only had 98 visitors entering over 16 hours). Clearly, the data highlight that the estuary in south Wales is already a key recreation destination irrespective of future housing growth. As is documented for many other Habitat sites, dog walking was by far the most common activity (48.9% of interviewees), followed by walking (29.8%) and family outings (5.9%). The proportion of dog walkers was considerably higher at Caldicot Coast Path and Black Rock Car Park, most likely because both survey points lie in easy walking distance to nearby residential development.

6.14 Another characteristic that was evident from the data relates to the loyalty of visitors to the site, with 51.6% of interviewees visiting either daily, most days (180+ visits per annum) or 1 to 3 times per week (40 to 180 visits per annum). No strong seasonal pattern in the recreational trends were discernible, indicating that the recreation disturbance potential does not reduce over the overwintering period of SPA / Ramsar birds. Home postcodes from interviewees were also collected to establish a core recreational catchment for the Welsh part of the Severn Estuary SPA / Ramsar / SAC. Using postcode data of interviewees visiting from home, a core catchment of 6.5km was established for the site. This is broadly similar to the core catchment established for Stroud District (7.7km) and by the West of England authorities (7.4km).

6.15 Stroud Council (in England) have recently increased the recreational catchment in their area for Severn Estuary from 7km to 12.6km, based on more recent visitor survey from 2022[40]. It is to be expected that different parts of the Severn Estuary have different recreational catchments, and the survey data for Monmouthshire clearly indicates a smaller core catchment. However, there is also value in authorities around the Severn Estuary adopting a consistent core catchment. For Cardiff, whether the zone was 7km or 12.6km would make no practice difference since Cardiff lies entirely within the former zone.

6.16 Potential for recreational impacts from new housing growth associated with the Severn Estuary SPA/Ramsar site exists not purely in Cardiff but across local authorities that lie within up to 12.6km of the SPA/Ramsar site. This includes Vale of Glamorgan, Rhondda Cynon Taf, Caerphilly, Torfaen (although visitor survey for that authority suggests relatively few Torfaen residents visit the SPA/Ramsar site), Newport and Monmouthshire in Wales. Therefore, loss of functionally-linked habitat in Cardiff could occur in combination with losses in those other authorities.

Implications for the Cardiff RLDP

6.17 No bespoke visitor survey at access points to the estuary in Cardiff has been undertaken and, therefore, no data on recreational patterns for the authority is available. However, given that Cardiff borders on the estuary and the contextual information from other visitor surveys of Severn Estuary in England and Wales, it is reasonable to assume that it lies within the core recreational catchment of the SPA / Ramsar / SAC. Postcode data from the Monmouthshire visitor survey indicate that Cardiff is the third most important contributor to footfall along the surveyed parts of the estuary after Monmouthshire and Newport (12 interviewees, 6.7%). Given that Cardiff residents travel to access points in other authorities, it is very probable that they will also utilise access points in southern Cardiff extensively. It is therefore reasonable to expect that the additional net new 9,744 dwellings expected in Cardiff will contribute to recreational pressure in the SPA/Ramsar site. **Therefore, it is considered that avoidance and mitigation measures are also required to allow housing growth in Cardiff to come forward.**

Mitigation through an Interim Impact Avoidance Strategy

6.18 It is likely that housing development to be delivered within Cardiff and adjoining authorities (the in-combination scope) will increase the visitor pressure in the Severn Estuary SPA / Ramsar / SAC, with potential adverse effects on overwintering birds and habitats. Given the high sensitivity of the SPA / Ramsar to impacts resulting from recreational pressure, adverse effects on its site integrity due to additional residential development cannot be excluded. Such pressure may also be exacerbated by initiatives under Policies SP10: Tourism and EC9: Hotel Development. It is anticipated that mitigation measures will be required to avoid adverse effects on the SPA / Ramsar. These could be delivered in the form of Strategic Access Management and Monitoring (SAMM) in the estuary itself, and / or through access enhancements and improvements to appropriately sited, existing or newly developed

[40] Agenda Item 9 - Appendix A - Severn Estuary Mitigation Strategy.pdf (moderngov.co.uk)
https://www.stroud.gov.uk/environment/planning-and-building-control/conservation-biodiversity-listed-buildings-trees-and-hedgerows/habitats-regulations-assessment-hra/
https://www.stroud.gov.uk/environment/planning-and-building-control/conservation-biodiversity-listed-buildings-trees-and-hedgerows/habitats-regulations-assessment-hra/severn-estuary-special-area-of-conservation-sac/

greenspaces. This section does not advocate or propose a full mitigation strategy, but rather scopes out the options that are available to the Council to address the issue of recreational pressure.

6.19 In England, authorities within the recreational catchment of sites that are sensitive to recreational pressure have developed SAMM strategies to avoid adverse effects on the Habitat sites; the most prominent examples being the Thames Basin Heaths SPA and the Dorset Heaths SPA. For example, to protect the Dorset Heaths, the authorities proposing residential development within the SPA catchment zones have set out the Dorset Heathlands Planning Framework Supplementary Planning Document (SPD)[41]. For example, in the case of the Dorset Heaths, the SPD proposes a series of SAMM projects, including undertaking of educational activities and employing wardens to manage visitor pressure. The funding for these measures is collected through a combination of Community Infrastructure Levy (CIL) and Section 106 agreements (planning obligations) payable by the developer. It is considered that similar measures (and funding mechanisms) could be deployed in the Severn Estuary SPA / Ramsar, to help manage recreational pressure. Such measures would have to be identified and developed in collaboration with all key stakeholders (i.e. authorities, private landowners) and in consultation with Natural Resources Wales.

6.20 The visitor survey data for Severn Estuary undertaken for Monmouthshire indicate that there are ample opportunities for SAMM projects to improve engagement with the SPA/Ramsar site. Most visitors are not aware of (125 interviewees, 66.5%) or unsure (21 interviewees, 11.2%) whether any conservation designations apply to the site. Furthermore, only one interviewee (0.5%) indicated that they knew about the site's SPA / Ramsar status and its international importance to overwintering birds. Regarding active conservation measures, a total of 87 interviewees (46.3%) had come across information boards along the estuary. Only 18 interviewees (9.6%) indicated that they were aware of any signage (e.g. dog-on-lead signs) along the estuary. Furthermore, only 3 interviewees (1.6%) had noticed a ranger presence along the estuary. These were all recorded at the RSPB Newport Wetlands, indicating that these are likely to have been RSPB employees rather than rangers specifically managing recreation in the estuary. Overall, 82 interviewees (43.6%) are not aware of any measures that are in place to deliver conservation in the SPA / Ramsar / SAC.

6.21 Therefore, various SAMM measures along the estuary could be deployed to decrease the likely impact of future housing growth delivered under the RLDP. For example, enhanced signage (e.g. dog-on-lead signs covering the overwintering period) along the estuary is likely to increase public awareness and reduce disturbance to sensitive bird species. Changes in how the estuary is managed may also be beneficial to the Severn Estuary SPA / Ramsar / SAC, provided they support the site Conservation Objectives. Improvements to footpaths along the estuary could be a key tool in discouraging off-track walking and reducing the number of major bird disturbance events.

6.22 Opening new areas of greenspace to the public or enhancing existing greenspaces is the second pillar of mitigating recreational pressure. Importantly, these alternative greenspaces should be less sensitive to disturbance, while aiming to recreate as best as possible a feeling of expanse and wilderness. It is recognised there is likely to be much less potential for this in urban areas such as Cardiff than in authorities with a more rural coastline.

6.23 In line with the broad Interim Impact Avoidance Strategy established for Stroud, it is recommended that a range of avoidance and mitigation measures are deployed within the authority and it would make sense for there to be a degree of integration between measures deployed in Cardiff and those in other Welsh coastal authorities of relevance (i.e. Newport and Monmouthshire). In summary, these would be the following

- Delivery of Suitable Alternative Greenspaces (SANGs) where possible in close proximity to emerging housing sites (although it is noted that it will be difficult to replicate the feel and attractiveness of the estuary and may not be practically feasible in Cardiff);
- On-site Strategic Access Management and Monitoring (SAMM) measures around key themes of wardening, signage, information boards, education and awareness, zoning and bylaws, and parking provision;
- Collaboration with key stakeholders (e.g. Natural Resources Wales, adjoining authorities and Parish councils) to achieve a coordinated, integrated, sustainable and long-term outcome; and

[41] The consultation draft of the Dorset Heathlands Planning Framework 2020-2025 can be found at: https://www.bournemouth.gov.uk/planningbuilding/PlanningPolicy/PlanningPolicyFiles/dorset-heathlands-planning-framework/dorset-heathlands-spd-2019-consultation.pdf [Accessed on the 30/06/2020].

- Future monitoring of recreation levels to assess changing recreation patterns and abundances / distributions of overwintering birds to assess the effectiveness of mitigation measures.

6.24 While this Interim Impact Avoidance Strategy was created using the evidence base for Stroud, similar mitigation measures could be deployed for Cardiff, if required. Visitor surveys in other Habitat sites (e.g. Solent, North Kent, Exe Estuary, Thames Basin Heaths, Dorset Heaths) have resulted in similar strategies. The typical set of tools for mitigating visitor pressure involves the provision of SANG and SAMM, which both need to be tailored to the site-specific context. An alternative solution could be a cross-authority collaboration, whereby Cardiff City Council would become a signatory to the existing Interim Impact Avoidance Strategy that was developed for Stroud District and which could be geographically expanded to cover Cardiff.

6.25 Policy BG1 of the Local Plan protects designated sites by preventing development that would lead to harm to sites of international and national nature importance. This policy also highlights that the backing of Statutory Nature Conservation Organisations will be required and Habitat Regulation Assessments may also be required where development may impact these sites.

6.26 However, it is recommended Cardiff incorporates a policy on Severn Estuary Recreational Pressure similar to that included for the same Habitats site in the Deposit Monmouthshire Local Plan, which identifies that proposals that would result in visitor pressure on the SPA/Ramsar/SAC will not be supported unless it can be demonstrated that no adverse impact on the integrity of the site will occur. It is understood that to address this Cardiff Council are proposing an additional policy BG7. This policy states that *'Development proposals that would result in an increase in visitor pressure on features of the Severn Estuary SAC, SPA, Ramsar site and Cardiff Beech Woods SAC, impact on functionally linked land with respect of the Severn Estuary Marine Site (EMS), will not be supported unless it can be demonstrated that the integrity of the European Marine Site or Cardiff Beech Woods SAC can be maintained following the HRA staged process'.* The policy then provides further explanation of how the policy will be delivered.

6.27 Since mitigation is likely to be most effective if coordinated in a SAMM or SANG strategy, Cardiff should also work towards developing a mitigation strategy funded by a tariff on net new residential development and have an outline of such a mitigation strategy available by the time of Local Plan Examination.

Cardiff Beech Woods SAC

6.28 The Cardiff Beech Woods SAC is designated for *Asperulo-Fagetum* beech forests and *Tilio-Acerion* forests of slopes, screes and ravines. Both these habitats are sensitive to recreational disturbance, particularly as a result of trampling. Policy SP1 (Providing for Sustainable Growth) identifies a need for 26,400 dwellings over the LP period (9,744 dwellings of which will be net new), which will result in an increase of Cardiff's population of approx. 21,436 additional residents. This will result in an increased demand for recreational greenspaces.

6.29 The SAC lies in the highly populated northern part of Cardiff, adjoining the urban areas of Pentyrch, Taff's Well and Tongwynlais. Residents from most dwellings allocated in north Cardiff will seek to engage in recreational activities locally, the most likely location for which will be the SAC.

6.30 Natural Resources Wales' Core Management Plan for the Cardiff Beech Woods SAC highlights that recreational use is a factor potentially affecting the *Asperulo-Fagetum* and Tilio-*Acerion* forests. The CMP states that '*the woodlands, especially Castell Coch and Fforestganol a Chwm Nofydd, experience heavy recreational pressure and certain areas are managed for this purpose.*' Development pressure from infrastructure in the vicinity is also referred to as an issue for the site, which includes housing development and associated negative impacts from recreational pressure and urbanisation. While no operational limits in terms of recreation have been set, NRW clearly highlight that a fuller understanding of a recreational baseline and habitat impacts is required. Access issues are to be kept under review. Overall, regarding the Cardiff Beech Woods SAC a balance between sustainable recreational use and protecting the nature conservation importance of the site is being sought by NRW. The Outdoor Recreation Valuation (ORVal) tool highlights that the Cwm Nofydd and Fforestganol SSSI alone is visited by 76,597 visitors per annum (which is a high number of visits for a Local Nature Reserve) and creates an annual welfare value of £225,525. Although the ORVal tool does not provide an estimate for the Castell Coch Woodlands, footfall within this part of the SAC is likely to be considerably higher due to the presence of specific features of interest (e.g. Taff trail and historic building).

6.31 Popular activities in the Cardiff Beech Woods SAC include walking, climbing and mountain biking, which are undertaken in all SSSI component parts. The Asperulo-*Fagetum* beech forests in the Castell Coch Woodlands are subject to particularly high levels of footfall, owing to the Taff train that permeates the woodland and the presence of the historic building, which attracts many visitors. The site has seen a particular increase in climbing, which has been identified as a potential threat to the trees at the top of the crag. The CMP indicates that access management is undertaken by individual site owners, with potential conflicts of interest being addressed through the Local Authority Access Forum. Given the increasing popularity of the site, there is increasing pressure to open up additional areas for access with potential negative impacts on the woodland ground flora and qualifying trees. CCW continues to work with Cardiff County Council and climbing groups to ensure that the Taff trail and climbing activities at the Castell Coch Road Section have no adverse effects on the conservation interest of the site.

6.32 Cardiff City Council have elected to go for a Sustainable Growth Strategy which aims at delivering the required housing target of 24,600 dwellings on brownfield sites within existing settlement boundaries. Allocated sites will largely comprise major regeneration and renewal areas located within or adjacent to district and local centres. A small part of the housing growth is to be delivered through an existing landbank of greenfield sites on the edge of the city. A Green Wedge in the north of the authority will be protected from inappropriate development including housing. This is positive for the Cardiff Beech Woods SAC, which lies within this green belt, as it means that housing growth in close proximity to the site will be limited.

6.33 To inform this appropriate assessment, AECOM in conjunction with a specialist survey company has undertaken visitor survey at 11 survey points (covering both parking and foot access locations) around Cardiff Beechwoods to provide visitor data for Cardiff Beechwoods SAC. This used a methodology widely used for other Habitats sites. Survey locations were chosen in discussion with Cardiff Council officers who are familiar with the Beech Woods. Eight locations were within the SAC, and/or at suitable access points for the SAC, while a further three locations were at other parts of the Beech Woods. Interviews ran from 8am to 6pm and contained a mixture of weekdays and weekends. Visitor counts were also completed. A total of four 5-hour survey shifts was completed at each survey location, with each location being surveyed on a weekday and at a weekend. A total of 44 five-hour survey shifts was therefore completed in August and September 2024. Survey locations and results are presented in Appendix C. As is documented for many other Habitat sites, dog walking was by far the most common activity (61.5% of interviewees), followed by walking (23%). Another characteristic that was evident from the data relates to the loyalty and frequency of visitors to the site, with 58.3% of interviewees visiting either daily, most days (180+ visits per annum) or 1 to 3 times per week (40 to 180 visits per annum). There was no strong seasonal pattern in the recreational trends were discernible. Home postcodes from interviewees were also collected to establish a core recreational catchment for the Cardiff Beechwoods SAC. Using postcode data of interviewees visiting from home, a core catchment of 6km (based on the zone within which 75% of visitors lived) was established for the site. While visitors were distributed across south Wales, a clear majority came from Cardiff itself.

6.34 Given the known vulnerabilities of Cardiff Beechwoods SAC and the fact that a majority of regular visitors to the SAC are Cardiff residents, it is considered that a total of 9,744 net new dwellings that do not already have planning consent will potentially increase recreational pressure in the SAC further. Such pressure may also be exacerbated by initiatives under Policies SP10: Tourism and EC9: Hotel Development. While tariffs on new development cannot be used to address existing recreational pressure issues, it is essential in order to conclude no adverse effects on SAC integrity from the Local Plan that a mechanism exists to address recreational pressure from further population growth. Although visitors come predominantly from Cardiff, the visitor survey indicates the 6km core catchment would also include Caerphilly and Rhondda Cynon Taf. Housing growth within 6km of the SAC in these two authorities (particularly Caerphilly town itself) could therefore act in combination with growth in Cardiff.

6.35 As with Severn Estuary, a common approach to addressing recreational pressure is a mixture of access management on site (SAMM) and provision of alternative recreational greenspace off-site. In this case, given the unique setting and appeal of Cardiff Beech Woods, and its close proximity to such a large source of visitors, it may be concluded that off-site new recreational greenspace has limited potential to draw people away from the SAC; nonetheless opportunities for creating alternative areas for easily accessible natural recreation in northern Cardiff should be explored for integration with the Green Wedge in the north of the authority where new development will not be permitted. This should focus on new woodland adjacent to the SAC, not just for recreation, but to allow expansion of the woodland resource to buffer impacts. If alternative natural greenspace is considered likely to be ineffective, the focus would be on recreation management within the SAC (SAMM). This is consistent with the approach taken at other

inland Habitats sites which are considered to have a particularly strong recreational draw, such as Cannock Chase SAC in the English midlands or the New Forest in southern England.

6.36 It is considered that the management of recreational use should centre on maintaining the network of public footpaths and access routes. Regular maintenance of the access network is key to prevent path widening, habitat erosion and desire lines. Furthermore, by focussing recreational footfall on a key network of paths, natural woodland processes and regeneration is safeguarded in other, more sensitive parts of the site. While recreational access to the *Tilio-Acerion* forests of slopes, screes and ravines is inherently limited by the steep and rocky terrain, similar management recommendations are provided in relation to this feature.

6.37 Policy BG1 of the Local Plan protects designated sites by preventing development that would lead to harm to sites of international and national nature importance. This policy also highlights that the backing of Statutory Nature Conservation Organisations will be required and Habitat Regulation Assessments may also be required where development may impact these sites. However, it was recommended Cardiff incorporates a policy of Cardiff Beechwoods Recreational Pressure similar to that recommended for Severn Estuary, which identifies that proposals that would result in visitor pressure on the Cardiff Beechwoods SAC will not be supported unless it can be demonstrated that no adverse impact on the integrity of the site will occur. It is understood that to address this Cardiff Council are proposing an additional policy BG7. This policy states that *'Development proposals that would result in an increase in visitor pressure on features of the Severn Estuary SAC, SPA, Ramsar site and Cardiff Beech Woods SAC, impact on functionally linked land with respect of the Severn Estuary Marine Site (EMS), will not be supported unless it can be demonstrated that the integrity of the European Marine Site or Cardiff Beech Woods SAC can be maintained following the HRA staged process'.* The policy then provides further explanation of how the policy will be delivered.

6.38 Since mitigation is likely to be most effective if coordinated in an SAMM, Cardiff should also work towards developing a mitigation strategy funded by a tariff on net new residential development and have an outline of such a mitigation strategy available by the time of Local Plan Examination.

Functionally Linked Land

Severn Estuary SPA / Ramsar

6.39 The Severn Estuary SPA / Ramsar designation covers most of the habitat that is used by its qualifying bird species, including the wet coastal grazing marsh, improved grassland and open standing water. However, some of its more mobile waterfowl and wader species, most notably the Bewick's swan and the white-fronted goose, might be expected to move the longest distance beyond the site boundary. The Natural England Advice Note[42] identifies that '*some species will also use areas of land and coastal waters outside the boundaries of both the European Marine Site, SPA and Ramsar site. Relevant authorities need to have regard to such adjacent interests, as they might be affected by activities taking place within, or adjacent to the European Marine Site.*' Effectively, this statement highlights that regarding the Severn Estuary SPA / Ramsar, due consideration must be given to the loss of functionally linked land.

6.40 Bewick's swans feed on several species of soft meadow grasses, including *Agrostis stolonifera* and *Alopecurus geniculatus* that are component species of wet meadows. Some of such habitat features might be located outside the Habitat site. The distance travelled to foraging grounds beyond the boundary of the SPA / Ramsar is likely to depend on the time of year, resource conditions within the SPA / Ramsar and interspecific competition. Due to a combination of these factors, Bewick's swans partially forage in fields at relatively great distances from their roosting locations. A study in the Netherlands determined that Bewick's swans foraged in arable fields 7.1km away from their roosts[43].

6.41 The Severn Estuary SPA/Ramsar is designated for its large population of waterfowl and waders generally, and for its specific populations of non-breeding Bewick's swan, white-fronted goose, dunlin, redshank, shelduck, gadwall, ringed plover, curlew and pintail. To aid consideration of functionally-linked land issues Natural England has produced unpublished guidance (there is no Natural Resources Wales equivalent).

[42] Published by Natural Resources Wales and Natural England. Available at: https://naturalresources.wales/media/673887/severn-estuary-sac-spa-and-ramsar-reg-33-advice-from-ne-and-ccw-june-09.pdf [Accessed on the 05/11/2019]

[43] Nolet B.A., Bevan R.M., Klaassen M., Langevoord O. & van der Heijden Y.G.J.T. 2002. Habitat switching by Bewick's swans: Maximisation of average long-term energy gain? Journal of Animal Ecology 71: 979-993.

This guidance groups birds by their maximum foraging distance. According to this guidance most waterfowl and waders remain within 2km of their core roost areas (i.e. the SPA/Ramsar site) when foraging. Of those species for which Severn Estuary SPA/Ramsar is designated the exceptions are Bewick's swan and white-fronted goose which forage up to 10km from their core roost sites. The same Natural England guidance considers that residential development could have an adverse effect on these two species if it resulted in loss of functionally-linked land up to 5km from the core roost areas (the SPA/Ramsar).

6.42 The following sites in Table 3 were identified as being of sufficient size and proximity to the SPA and Ramsar to be utilised by SPA birds.

Table 3. Local Plan sites over 2ha and within 5km of Severn Estuary SPA/Ramsar

Site Reference	Site Name	Units	Area ha
SH1.7	Former Gas Works, Ferry Road	500	3.98
H1.1	Land at areas 9-12, St Mellons	150	4
H2.7	Land at Callaghan Square	315	3.36
H2.6	Hadfield Road/ Wholesale Fruit Market, Bessemer Road	200	4.8
H2.5	Porth Teigr and Alexandra Head	2,310	27
H2.4	Roath Dock (Northside)	Port, port-related uses and mixed-use development	3.67
H2.1	International Sports Village	1,000	5.88
H11	Gypsy and traveller site – Pengam Green	~80 Gypsy and Traveller Pitches	6.8

6.43 Of these sites, only Land at areas 9-12, St Mellons was identified as a Greenfield site, although without further survey the level of suitability is difficult to assess. These are generally the parameters that are used for the identification of potential functionally linked land. In addition to specific housing or mixed use sites, Policy SP9 (Supporting the Role of Cardiff Port) identifies that further employment generating activities, including the provision of industrial and logistical uses, and green energy generation will be supported. There will also be flexibility to allow leisure, residential and mixed uses, within appropriate areas provided they are compatible with surrounding (port-related) uses. These uses are not specified in the Local Plan and are to be determined by the Port in the future, but potential for impacts on functionally-linked habitat will need to be considered as part of the planning applications for any such proposals. This will not only apply to areas of undeveloped land within port ownership but some of the docks of the port may themselves be functionally linked to the SPA/Ramsar site.

6.44 Potential for loss of functionally linked habitat associated with the Severn Estuary SPA/Ramsar site exists not purely in Cardiff but across local authorities that lie within 5km of the SPA/Ramsar site and where suitable areas of habitat to serve as high tide roosts exists. This includes Vale of Glamorgan, Newport and Monmouthshire in Wales. Therefore, loss of functionally-linked habitat in Cardiff could occur in combination with losses in those other authorities.

6.45 Given that the area north of the SPA / Ramsar contains habitat of sufficient size with several areas suitable as functionally-linked land, it is recommended that the following text (or similar) be inserted into an appropriate policy of the Local Plan: '*To meet the requirements of the Habitats Directive, the applicant should be required to provide evidence that the development will not result in adverse effects on the integrity of the Severn Estuary SPA / Ramsar regarding its qualifying bird species. To demonstrate this, a survey will be required to determine the habitats and current site use to verify if the land parcel is indeed suitable for supporting a significant population*[44] *of designated bird species. Where habitats are suitable, non-breeding bird surveys will be required to determine if the site and neighbouring land constitute a significant area of supporting habitat. Bird surveys will need to be undertaken during autumn, winter and spring. If habitat within the site or adjacent land are identified to support significant populations of designated bird species, avoidance measures and mitigation will be required, and the planning application*

[44] A significant population is classified as a site that regularly used by 1% or more of the population of qualifying bird species

will likely need to be assessed through a project specific Habitats Regulations Assessment to ensure that the development does not result in adverse effects on integrity.'

6.46 It is understood that to address this Cardiff Council are proposing an additional policy BG7. This policy states that *'Development proposals that would result in an increase in visitor pressure on features of the Severn Estuary SAC, SPA, Ramsar site and Cardiff Beech Woods SAC, impact on functionally linked land with respect of the Severn Estuary Marine Site (EMS), will not be supported unless it can be demonstrated that the integrity of the European Marine Site or Cardiff Beech Woods SAC can be maintained following the HRA staged process'.* The policy then provides further explanation of how the policy will be delivered.

Water Quality

Severn Estuary SPA / Ramsar / SAC

Sewage Effluent (Wastewater Treatment Works and Combined Sewer Overflows)

6.47 WwTWs serving new housing and employment development will discharge additional treated effluent, either directly into the Severn Estuary or into waterbodies that are in hydrological continuity with the Habitat site. This effluent will result in additional nutrient loadings in the estuarine waters. In coastal environments, nitrogen is considered to be the primary growth-limiting nutrient, although phosphorus may be co-limiting particularly in transitional waters like estuaries. Therefore, it must be ensured that the allocated growth will not result in a deterioration of the water quality in the Severn Estuary SPA / Ramsar / SAC.

6.48 Both the SPA / Ramsar and SAC designations are considered vulnerable to negative water quality impacts. For example, the 'estuaries' feature in the SAC is sensitive to excessive nutrient inputs, which can lead to changes in water temperature, dissolved oxygen (DO) concentrations and turbidity through a process known as eutrophication. Impacts caused by treated sewage effluent can reduce the overall quality of the estuarine habitat with knock-on effects on qualifying SAC and SPA / Ramsar species. Water quality changes can also affect the condition of the intertidal zone, such as the 'mudflats and sandflats' feature. The degree of oxidation / reduction, a measure of oxygen availability within the sediment, has a critical influence on infaunal communities. Negative water quality changes may impact SPA / Ramsar waterfowl and waders indirectly through cascading effects in the food web. Most qualifying species feed on invertebrates within and on the sediment (e.g. *Gammarus, Hydrobia, Arenicola, Corophium*, etc.), the abundance and distribution of which may be impacted by changing water quality.

6.49 Nitrogen pollution is responsible for causing a wide range of negative impacts to estuarine and coastal waters. While the primary anthropogenic source of nitrogen is land run-off (primarily from agriculture), a significant portion is contributed in treated effluent from Wastewater Treatment Works (WwTWs) and storm drain overflows45. It is important to note that the Severn Estuary lies within a catchment that is naturally rich in nitrogen from high-nitrate soils, often in Nitrate Vulnerable Zones (NVZs). Eutrophication in the coastal environment arises when water is enriched with nitrogen, the primary limiting nutrient in seawater, although it should be noted that other parameters such as phosphorus concentrations, silicate availability, light levels and temperature are also very influential. A study of estuaries in mainland Britain46 showed a significant correlation between the log total annual loads of Total Oxidised Nitrogen (nitrate plus nitrite) and spring maximum chlorophyll a concentrations, demonstrating a direct link between nitrogen source and ecosystem response. The main consequence of nitrogen pollution in transitional waters is the excessive growth of macroalgal mats in intertidal zones, which can affect invertebrates, smother saltmarsh vegetation and interfere with the ability of waders and waterfowl to feed adequately. Other key biological consequences of nutrient enrichment include:

- Phytoplankton and algal blooms;
- Reduced water quality (e.g. high levels of ammonia and high turbidity);
- Loss of macrobenthos communities;

[45] Mustow S. (2020). Nitrogen pollution in estuarine and coastal waters. *CIEEM InPractice* **110**: 11-14.
[46] Nedwell DB, Dong LF, Sage A & Underwood GJC. (2002). Variations of the nutrient loads to the mainland U.K. estuaries: Correlation with catchment areas, urbanization and coastal eutrophication. *Estuarine, Coastal and Shelf Science* **54**: 951-970.

- Changes to food web structure; and
- Creation of hypoxic conditions.

6.50 Welsh Water is the responsible body for the treatment of domestic and industrial sewage in Cardiff. The company has published a Drainage and Wastewater Management Plan (DWMP) 2024[47], which sets out the steps that will be taken to treat surface runoff and sewage generated as a result of the emerging RLDP, with a view to protect the integrity of the water environment. The DWMP appraises the challenge of protecting water quality in the context of key future trends, including changing climate patterns, emerging and persistent contaminants (e.g. microplastics, pharmaceutical compounds), pressures of rising phosphorus / nitrogen loadings, combined sewer overflows (CSOs) and regulatory changes. For example, CSOs were designed over 100 years ago with the objective to relieve pressure in the drainage system and protect people from flooding. CSOs discharge excess rainwater mixed with raw sewage directly into the aquatic environment, with potential long-term negative impacts on water quality and associated biodiversity.

6.51 Cardiff lies within Welsh Water's South East Valleys operational wastewater planning area[48]. The South East Valleys comprise 25 wastewater catchments and a population of approx. 1,177,064. Overall, there are 25 WwTWs, 305 Sewerage Pumping Stations (SPS) and 552 CSOs across the river basin catchment level. The main rivers draining to the coastal area around Cardiff City are the Rhymney, Taff and Ely. Overall, Welsh Water considers that the population in the South East Valleys operational wastewater planning area is predicted to decrease to 801,900 by 2050 (a reduction of 32%), although in the short-term major developments (such as housing allocated in the Cardiff RLDP) will result in additional pressures on the wastewater network.

6.52 Welsh Water employed several predictive modelling tools to inform their DWMP. The Risk Based Catchment Screening (RBCS) indicates that the main challenges for the 25 WwTWs in the region are to do with accommodating flow volumes rather than water quality compliance. For example, 24 WwTWs are susceptible to sewer flooding in extreme wet weather events and 13 WwTWs experience catchment failures under Dry Weather Flows (DWFs). A Baseline Risk and Vulnerability Assessment (BRAVA) for the year 2025 demonstrates that the highest risks to river basin catchments emanate from flooding in extreme storms, water pollution in storm events, sewere collapses and WwTWs storm flow compliance.

6.53 Cardiff City itself lies within the Rhymney R – conf Nant Cylla to Chapel Wood planning catchment, which is served by five WwTWs. This planning catchment has a population of 930,875, accounting for the bulk of urban development in the South East Valleys river basin catchment. The 2025 and 2050 BRAVA for this planning catchment highlights that the area is at risk of flooding and pollution caused by hydraulic overload. The DWMP also provides a classification of the quality of waterbodies in the planning area according to its physical, biological and chemical properties. Its water quality status for 2050 is predicted as 1 (i.e. best possible water quality and lowest priority for interventions), with targeted investment strategies for mitigation and focus to be implemented in Asset Management Period (AMP) 11.

6.54 A supply-demand assessment of the capacity of the five WwTWs in the planning area has been undertaken for future DWFs and wet weather flows up to 2050. Importantly, these assessments consider the forecast future growth, including that allocated in the Cardiff RLDP. The results for the DWF assessment indicate that there will be sufficient headroom at the WwTWs to accommodate the allocated growth up to 2050, including a 20% spare treatment capacity. Under wet conditions there is capacity to treat 70% of wet weather flows in the catchment to 2050; however local incapacity issues are predicted at individual works for treatment targets of 80% and 90% of wet weather flows respectively. Welsh Water seeks to address the shortages in treatment capacity under wet weather flows by improving headroom of the sewage network, primarily by reducing per capita water consumption (to 100l per person per day by 2050) and volume of trade effluent (by 25% in the long-term). Currently, 19 schemes are put forward in the first cycle preferred plan for Cardiff Bay WwTW to reduce the number of CSO overflows and other flooding events associated with the works.

6.55 The data presented in Welsh Water's DWMP indicates that the current headroom at WwTWs serving Cardiff is sufficient to accommodate the growth anticipated to 2050, including that allocated in the RLDP.

[47] Welsh Water. (November 2023). Drainage and Wastewater Management Plan 2024. Available at: https://www.dwrcymru.com/en/our-services/wastewater/drainage-and-wastewater-management-plan [Accessed on the 04/04/2023]
[48] Welsh Water. (November 2023). Drainage and Wastewater Management Plan 2024 – River Basin Catchment Summary for South East Valleys. 58pp. Available at: https://www.dwrcymru.com/en/our-services/wastewater/drainage-and-wastewater-management-plan [Accessed on the 04/04/2023]

None of the WwTWs are reported to be at risk of failing the required environmental water quality standards. Natural Resources Wales set Environmental Quality Standards (EQS) for all important non-toxic and toxic aquatic pollutants, which are set in the context of broad water quality targets specified in the Water Framework Directive (WFD). The water quality requirements of qualifying habitats and species are fundamental in informing these targets and, therefore, remaining within the consented discharge flows / concentrations implies that no adverse effects on Habitat sites will occur in relation to water quality changes. Since Welsh Water's DWMP is undertaken at a strategic level it inherently takes into account the impact of population growth across its service area and is therefore inherently 'in combination'.

6.56 In addition to other housing development policies, delivering Policies SP9 Supporting the role of Cardiff Port, and SP8: Supporting the Central and Bay Business Area will necessarily require the re-development of brownfield sites. A significant proportion of the Cardiff Bay and port areas are made ground and/or historic landfill sites. Therefore, re-development could lead to contamination of the Severn Estuary SAC/SPA/Ramsar site. Whilst there is mapping of historic landfill sites, ground investigations may reveal previously unknown areas of contamination which increases the risk of contamination to the Severn Estuary. However, under the Environmental Damage (Prevention and Remediation) (Wales) Regulations 2009 and the Environmental Permitting (England and Wales) Regulations 2016, it is illegal to pollute watercourses, irrespective of their designation. Therefore, investigations and mitigation/control measures would be required by law as part of any redevelopment of these areas. Moreover, Policy SP22: Minimising Impacts on Natural Resources, requires the protection and preservation of water quality. It is therefore considered the Local Plan does contain a sufficient policy framework to ensure the protection of the Severn Estuary.

Water Quantity, Level and Flow

Severn Estuary SAC / SPA / Ramsar

6.57 The quantity of freshwater supply to estuarine and coastal sites has a strong influence on prevailing habitat conditions. The Severn Estuary SAC is designated for a range of habitats that are sensitive to changes in water flow rates. For example, intertidal sand- and mudflats have a high vulnerability due to potential sediment accretion and erosion in key parts of the SAC, potentially altering the biotic communities present within the sediment. Changes in water flow rate may also impact Atlantic saltmarsh by increasing sediment deposition and altering the emergence regime (i.e. the proportion of time that vegetation is submerged in water or exposed to the air). The morphology of saltmarsh vegetation is primarily influenced by its position within the tidal frame, indicating it is sensitive to water quantity changes and desiccation effects.

6.58 It is unlikely that changes in water flow rates in the estuary will impact SPA / Ramsar birds (e.g. Bewick's swan) directly. Instead, the primary impacts would occur as indirect effects on foraging and roosting habitats. The intertidal mud- and sandflats, as well as saltmarsh have 'high vulnerability'. Reductions in the quality of supporting habitats may affect the long-term survival of individuals and could ultimately result in population-level changes. Notably, changes in water flow rates into the estuary are also linked with negative water quality impacts, such as changes in sedimentation, turbidity, thermal regime and salinity (see previous section for an AA of the water quality impact pathway).

6.59 Welsh Water is the water company that supplies large parts of Wales with potable water. The company is currently working on their Water Resources Management Plan (WRMP) 2024[49], which incorporates improved evidence around water resource resilience and a stronger obligation towards enhancing the environment in Welsh catchments. There are 23 Water Resource Zones (WRZs) across Wales and Cardiff falls within the SEWCUS WRZ. Baseline evidence laid out in the WRMP indicates that three WRZs are predicted to face deficits in the supply-demand balance to 2050 under the preferred planning scenario[50], including Tywi Gower, Lleyn Harlech-Barmouth, and SEWCUS (noting that SEWCUS was not identified as having a deficit in the WRMP19). This indicates that the current level of water provision will not be sufficient to meet the projected population in these WRZs, which includes housing development delivered under the Cardiff LP. Therefore, further options will be needed to attain the required level of water supply, which may include the development of new resources or increases in abstraction rates from existing water

[49] Welsh Water. (October 2022). Draft Water Resources Management Plan 2024. 66pp. Available at: https://www.dwrcymru.com/en/our-services/water/water-resources/draft-water-resources-management-plan-2024 [Accessed on the 28/04/2023]

[50] The preferred planning scenario for the WRMP24 considers a 1 in 200 year level of drought resilience for emergency measures and a medium emission climate scenario.

resources. If additional freshwater was abstracted from waterbodies in hydrological continuity with the Severn Estuary SAC / SPA / Ramsar, this could have an impact on the ecological integrity of the site.

6.60 Based on the projected shortfall in potable water supply, Welsh Water are developing their Preferred Plan to address any supply deficits. The main pillar of the strategy is an ambitious demand management programme. For example, it is planned to reduce leakage by 50% (compared to the 2017/18 levels) by 2050. The key delivery pathway for leakage reduction is to introduce smart metering, attaining a penetration of between 50 to 70% over the course of AMP8. Installing smart meters will enable the discovery of previously unknown leaks through active leakage control and customer reporting. The main pathways of addressing Customer Supply Pipe (CSP) leakage is via increased leak awareness as well as reduced tap run times. This will be augmented by mains renewal schemes in the later stages of the WRMP period to further build network resilience. Modelling indicates that demand management will reduce the volume of leakage from 163.80Ml/d in 2020/21 to 85.52Ml/d in 2049/50.

6.61 The company also considered a wide range of supply side options for the SEWCUS WRZ, including the reintroduction of currently unused sources and new sources of water (e.g. Grwyne Fawr, Wentwood reservoirs). However, novel catchment and system modelling indicates that the main limiting factor within this WRZ is the existing network connectivity (between 'high level' and 'low level' storage assets) rather than an actual shortfall in Deployable Output (DO). In other words, while sufficient potable water is available for distribution, the main issue is how this water can be adequately stored, transferred and be made available in particular zones (especially under drought conditions). Therefore, any options for new water sources have been rejected and the preferred options for addressing the supply-demand deficit relate to connectivity within the company's distribution system:

- Scheme for increasing the capacity of the Memorial pumping station and associated water distribution network to allow increased supplies from the Court Farm Water Treatment Works (WTWs) in the system; and
- Scheme to allow the reduction in flows in the Llwynon trunk mains to zero, thereby increasing storage capacity in the Taff reservoirs and making them more drought-resilient.

6.62 Overall, the Preferred Plan for the SEWCUS WRZ will benefit the environment (including Habitat sites), particularly in the long-term. By introducing demand management measures, the overall demand for water will decrease by an average of 18 million litres per day by 2030. This will reduce the pressure on water resources and facilitate a more sustainable management of natural resources (SMNR), a long-term goal for the Welsh Government. Furthermore, the above supply-side options that enhance network connectivity will enable the company to make better use of existing resources, rather than developing new water resources. Clearly, by avoiding the need for additional water abstractions, the risk to Habitat sites that depend on adequate flow rates is reduced.

6.63 At the time of writing, the evidence included in the WRMP24 indicates that Welsh Water's approach to future water management has no potential of negatively impacting the Severn Estuary SAC / SPA / Ramsar regarding freshwater flow rates. Therefore, adverse impacts on the integrity of the estuary can be excluded. Since Welsh Water's WRMP is undertaken at a strategic level it inherently takes into account the impact of population growth across its service area and is therefore inherently 'in combination'.

Atmospheric Pollution

6.64 All traffic growth on major roads within 200m of the relevant Habitats sites was modelled. This included both traffic growth due to Cardiff Local Plan and wider traffic growth on the road network over the plan period to 2036. All modelling results are presented in Appendix D. Oxides of nitrogen, ammonia and nitrogen deposition were modelled. Four scenarios were modelled:

- Baseline – the current situation based on traffic counts for the relevant roads.
- Future baseline – the situation in 2036 in the hypothetical situation of no traffic growth.
- Do minimum – the situation in 2036 allowing for traffic growth on the road network, including from other authorities (e.g. Newport) but excluding Cardiff Local Plan; and
- Do something – identical to the Do minimum scenario but including Cardiff Local Plan.

6.65 The difference between the Do something and Do minimum scenarios identifies the contribution of Cardiff Local Plan, while the difference between the Do something and Future baseline scenarios identifies the 'in combination' effect of all traffic growth. The air quality modelling is therefore inherently in combination with other plans or projects.

6.66 Paragraph 5.26 of Natural England guidance (the only detailed guidance on the issue)[51] states that '*An exceedance* [of a critical level or load] *alone is insufficient to determine the acceptability (or otherwise) of a project'*. Where an exceedance of the Critical Load is expected, it is also necessary to consider whether the forecast dose will be imperceptible. As per paragraph 4.25 of same guidance '*…1% of critical load/level are considered by Natural England's air quality specialists (and by industry, regulators and other statutory nature conservation bodies) to be suitably precautionary, as any emissions below this level are widely considered to be imperceptible…There can therefore be a high degree of confidence in its application to screen for risks of an effect'*.

6.67 However, the 1% threshold is not a damage threshold. Guidance goes on to state that Paragraph 5.28 of that guidance states 'In practice, where a site is already exceeding a relevant benchmark, the extent to which additional increments from plans and projects would undermine a conservation objective to 'restore' will involve further consideration of whether there is credible evidence that the emissions represent a real risk that the ability of other national or local measures and initiatives to otherwise reduce background levels will be compromised in a meaningful manner' [emphasis added].

6.68 The implications of policy SP19: Securing New Transportation Infrastructure has been considered but the schemes identified in that policy do not affect the modelled roads in this assessment.

Severn Estuary SAC/SPA/Ramsar site

6.69 One transect was modelled into the SAC/SPA/Ramsar site, at the only location where a road likely to be used by through traffic lies within 200m of the site in Cardiff. This is transect E01. The most sensitive designated habitat to atmospheric pollution is the saltmarsh habitat. Saltmarsh does not support significant lichen or bryophyte populations such that the appropriate critical level is 3 μgm^{-3}. For nitrogen deposition saltmarsh has a critical load range of 10-20 kgN/ha/yr. The lower part of the critical load range is appropriate to be used for upper saltmarsh (rarely inundated) while the upper part of the critical load range is appropriate for lower saltmarsh (frequently inundated). For the purposes of this assessment the critical load for lower saltmarsh was used as a precaution.

6.70 Oxides of nitrogen (NOx) are not identified as a concern on any modelled transect as at no point on any transect will it exceed the critical level for all vegetation of 30 μgm^{-3}. Since the critical level is not forecast to be breached no adverse effect on integrity will arise notwithstanding traffic growth. The relevant ammonia critical level of 3 μgm^{-3} is not exceeded on any transect under any scenario for ammonia. Since the critical level is not forecast to be breached no adverse effect on integrity will arise notwithstanding traffic growth.

6.71 With regard to nitrogen deposition, 'in combination' deposition at 10m from the roadside is forecast to be 0.36 kgN/ha/yr (3.6% of the lower critical load). This is a small exceedance but cannot be dismissed as inherently imperceptible. However, the aforementioned guidance identifies that 'the extent to which additional increments from plans and projects would undermine a conservation objective to 'restore' will involve further consideration of whether there is credible evidence that the emissions represent a real risk that the ability of other national or local measures and initiatives to otherwise reduce background levels will be compromised in a meaningful manner'. In this case a net improvement in nitrogen deposition of 2.49 kgN/ha/yr is forecast at 10m from the roadside by 2036 with no growth (the difference between 2036 Future Baseline (FB) and the 2024 Base in Appendix D), or an average improvement of 0.2 kgN/ha/yr per year.

6.72 It can therefore be concluded that the in combination impact of traffic growth will delay this forecast improvement by less than 2 years, which is not likely to meaningfully compromise the ability of other measures to improve nitrogen deposition rates. Moreover, examination of the area of saltmarsh in question on GoogleEarth and StreetView indicates that it is predominantly (if not entirely) upper saltmarsh to which a critical load of 20kgN/ha/yr would apply. If the upper critical load is applied the 'in combination' impacts would be lower, being 1.8% of the critical load.

[51] http://publications.naturalengland.org.uk/publication/4720542048845824

6.73 It is therefore considered that traffic growth on this road link will not result in an adverse effect on the integrity of Severn Estuary SAC/SPA/Ramsar site.

Cardiff Beechwoods SAC

6.74 Two transects were modelled off the A470 into Cardiff Beechwoods SAC. These are transects E02 and E03. The only SAC habitat present within this part of the SAC (Castell Coch Woodlands and Road Section SSSI) is the beech woodland. Oxides of nitrogen (NOx) are not identified as a concern on any modelled transect as at no point on any transect will it exceed the critical level for all vegetation of 30 μgm^{-3}. Since the critical level is not forecast to be breached no adverse effect on integrity will arise notwithstanding traffic growth.

6.75 Total ammonia concentrations are slightly above the critical level for lichens, being approximately 2.3 μgm^{-3} at the closest point on the transect (10m from the road) in all scenarios. The contribution of Cardiff Local Plan is 0.06 μgm^{-3} at the closest point. This is above 1% of the critical level and therefore cannot be dismissed as mathematically imperceptible. The contribution of Cardiff Local Plan drops below 0.01 μgm^{-3} by 70m. Therefore, 1.9ha (11% of the 17ha SSSI) or 1.7% of the 114.45ha SAC (or 3.7% of the 51.96ha of beech woodland in the SAC) is affected to some degree by Cardiff Local Plan. The worst case in combination effect is 0.15 μgm^{-3} (15% of the lower critical level or 5% of the upper critical level).

6.76 However, the upper critical level of 3 μgm^{-3} can apply to beech woodland if the woodland in question has no particular lichen interest.. Castell Coch Woodlands and Road Section SSSI is not mentioned as an important lichen SSSI in published research[52]. Moreover, the Management Plan for the SAC[53] makes no mention of lichens or lower plants in its vision or performance indicators for the SAC, and it mentions that the woodland is subject to low light levels, which would not generally be conducive to higher lichen diversity.

6.77 In combination nitrogen exceeds 1% of the critical load of 10 kgN/ha/yr, being a maximum of 1.32 kgN/ha/yr (10.32% of the critical load) at the closest point to the road. The contribution of Cardiff Local Plan alone exceeds 1% of the critical load being a maximum of 0.54 kgN/ha/yr at its closest point. However, the aforementioned guidance identifies that 'the extent to which additional increments from plans and projects would undermine a conservation objective to 'restore' will involve further consideration of whether there is credible evidence that the emissions represent a real risk that the ability of other national or local measures and initiatives to otherwise reduce background levels will be compromised in a meaningful manner'. In this case a net improvement in nitrogen deposition of 7.68 kgN/ha/yr is forecast on transect E03 at the closest point to the roadside by 2036 with no growth (the difference between 2036 Future Baseline (FB) and the 2024 Base in Appendix D), or an average improvement of 0.64 kgN/ha/yr per year.

6.78 It can therefore be concluded that the in combination impact of traffic growth will delay this forecast improvement by 2 years, which is not likely to meaningfully compromise the ability of other measures to improve nitrogen deposition rates. In addition, the management plan for the SAC states regarding air quality '*No limits set. There is no evidence to date that this has had an adverse impact on the features but this may need to be addressed in more detail in the future*'. Given traffic related air quality can also be considered an improving issue as we move to electrification of the fleet, it is therefore considered that traffic growth on the A470 will not result in an adverse effect on the integrity of the SAC.

Coastal Squeeze

Severn Estuary SPA / Ramsar / SAC

6.79 As discussed in the previous chapter, the Severn Estuary SAC / SPA / Ramsar is under increasing threat from coastal squeeze, whereby landward Hold the Line defences prevent the inland migration of intertidal habitats in response to sea level rise. This results in continuing loss of SAC habitats that are also important in sustaining overwintering SPA / Ramsar birds.

[52] https://naturalresources.wales/media/695442/nrw-evidence-report-369-a-review-of-non-vascular-plant-and-fungal-sssi-features-in-wales-lichens-accessible.pdf

[53] https://naturalresources.wales/media/672066/FINAL%20Cdf%20Beech%20Woods%20SAC%20Man%20Plan.pdf

6.80 Cardiff City, being the capital of Wales, is intensively urbanised and industrialised. The issue of coastal squeeze arises at the interface between landward development and the estuary. A review of satellite imagery indicates that entire waterfront along the estuary comprises essential human infrastructure, such as industrial development around the Cardiff Docks and housing in the vicinity of Pengam Green. To protect important human assets, strategic policies would have been implemented in the relevant overarching Shoreline Management Plan (SMP). Cardiff City is covered in the Severn Estuary SMP2 Theme area 'Cardiff', setting out three Policy Units CAR1, CAR2 and CAR3. The key policy drivers identified for this Theme area are as follows:

- Critical infrastructure – railway line, electricity substations and docks;
- Residential development – Cardiff;
- Industrial and commercial developments – Cardiff Bay and docks;
- International nature conservation sites – Severn Estuary SAC, SPA and Ramsar; and
- Wales Coast Path routes.

6.81 For example, the Preferred Policies for CAR1 (Cardiff Bay Barrage) is to Hold the Line across all three epochs of the SMP to 2105. This implies that the Cardiff Bay Barrage will remain in place over the long-term with essential maintenance to ensure its functionality. The predicted implication of the policy approach for CAR1 for nature conservation is that intertidal habitats will be lost in epochs 2 and 3 of the SMP, analogous to sea level rise modelling predictions. Similar shoreline management approaches have been adopted for Policy Units CAR2 and CAR3, for which a loss of intertidal mudflats and saltmarsh is also predicted in the latter stages of the SMP.

6.82 SMPs are strategic planning documents that must be subjected to the relevant statutory environmental assessments, including HRA. This occurred for the Severn Estuary SMP as indicated in the available government sign off forms for the SMP[54]. This will have ensured that the implementation of the management approaches does not result in adverse effects on the integrity of the Severn Estuary SPA / Ramsar / SAC regarding coastal squeeze. In particular, in order to obtain consent for adoption, the accompanying HRAs would have had to demonstrate No Reasonable Alternatives (for achieving similar objectives), IROPI and adequate habitat compensation for the projected loss over the SMP period. The same is true for any coastal defence schemes that are devised to implement the SMP policy.

6.83 The Local Plan would only result in adverse effects on integrity if it required the policy intent of the SMP to be changed (i.e. from 'Management Realignment' or 'No Active Intervention' to Hold the Line) as that would trigger an impact which had not been taken into account the design of those plans, their HRAs and any necessary derogations. Delivering the Local Plan will not require any change to SMP policy.

6.84 Therefore, there will be no adverse effects of the Cardiff LP on the Severn Estuary SAC / SPA / Ramsar regarding coastal squeeze. The required statutory tests would have been undertaken and met at the planning level of the relevant SMP, as this is a legal requirement for all SMPs before they are adopted.

[54] Item-1-SMP19.pdf

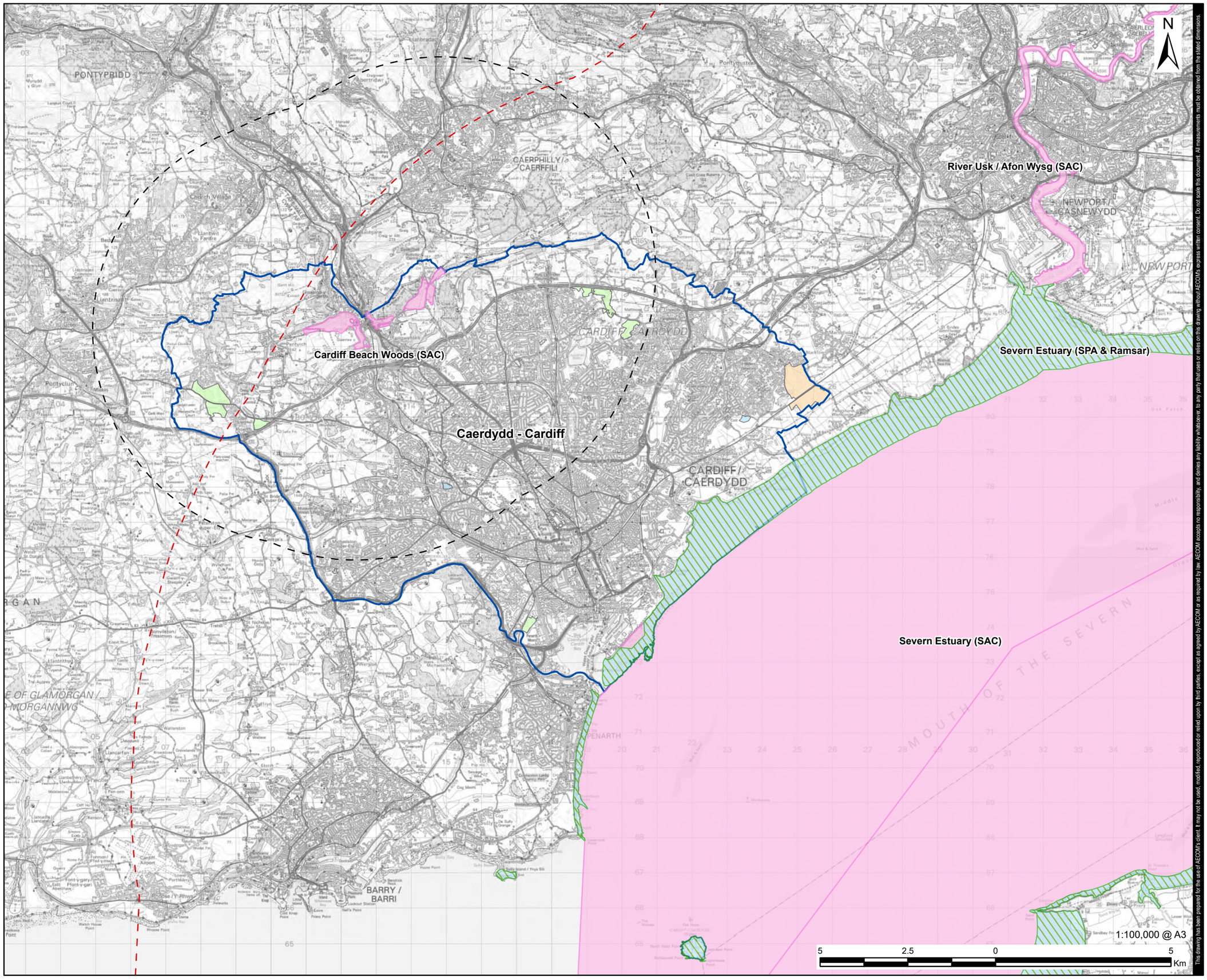
7. Conclusion

7.1 With the changes made to the Local Plan in response to recommendations, it is considered that the Cardiff Local Plan contains a sufficient policy framework that no adverse effect would arise on Habitats sites either alone or in combination with other plans or projects.

Appendix A Map of Habitat Sites

Revision: 1 Drawn: JA Checked: AG Approved: XX Date: 2024-12-09

Filename: C:\Users\Airlie.J\OneDrive - AECOM\Documents\Projects\60703750 - Cardiff Beech Woods\02_Maps\Cardiff_HRA_Figure1\Cardiff_HRA_Figure1.aprx



AECOM

PROJECT

Cardiff Replacement Local Development Plan

CLIENT

Cardiff Council

CONSULTANT

AECOM Limited
4th Floor, One Temple Quay
Temple Back East,
Bristol, BS1 6DZ
www.aecom.com

LEGEND

- 6km Cardiff Beach Woods Study Area
- 12.6km Severn Estuary Study Area

Allocations

- Non-Strategic Housing Sites
- Strategic Employment Sites
- Strategic Housing Sites
- Cardiff District Boundary

Designations

- Special Protection Areas (SPA)
- Special Areas of Conservation (SAC)
- Ramsar

NOTES

ISSUE PURPOSE

FOR INFORMATION

PROJECT NUMBER

60703750

FIGURE TITLE

Location of the Cardiff Replacement Local Development Plan Allocations in Relation to Designated Habitat Sites

FIGURE NUMBER

Figure 1

Appendix B Screening Table

Table 4. Policy Screening Table

Policy	Description	Likely Significant Effects
Policy SP1: Providing for Sustainable Growth	This policy sets out a strategy to make provision for 26,400 (including a 10% flexibility allowance above anticipated need) dwellings and 32,300 new jobs over the plan period.	Likely Significant Effects (LSEs) of this policy on Habitat sites cannot be excluded. Policy SP1 provides for sustainable growth across Cardiff County, including the provision of 26,000 new additional dwellings (this includes a 10% flexibility allowance) and 32,300 new jobs over the plan period. A range of potential impact pathways is associated with the policy: • Recreational pressure • Loss of functionally linked habitat • Atmospheric pollution • Water quality • Water quantity, level and flow Due to these linking impact pathways Policy SP1 is screened in for Appropriate Assessment (AA).
Policy SP2: Sustaining Economic Growth and Resilience	This policy makes provision for a range and choice of employment sites for different types of employment and in different geographical locations to contribute towards the delivery of the level of growth set out in the plan. This will be supported by a strong framework to protect the future role of the city's employment land, through the designation of strategically and locally important employment land and premises. These areas will be identified on the proposals map and will continue to be required for employment purposes. Such areas will need to be safeguarded from alternative forms of development, in order to effectively meet future supply in relation to both office/research and development floorspace, as well as industrial and warehousing land, over the plan period.	LSEs of this policy on Habitat sites cannot be excluded. Policy SP2 provides for a range of employment types in different geographic locations across Cardiff County, including the designation of strategically and locally important employment land. A range of potential impact pathways is associated with the policy: • Loss of functionally linked habitat • Atmospheric pollution

Policy	Description	Likely Significant Effects
		• Water quality • Water quantity, level and flow Due to these linking impact pathways Policy SP2 is screened in for AA.
Policy SP3: Ensuring a Masterplanning Approach	This policy requires a master planning approach will be required for strategic sites and developments over 100 homes, or projects with multiple phases of development. Plans for development sites which conform to these criteria should accord with masterplanning general principles including: Encompassing the whole of a development area; Being planned in a comprehensive and integrated manner reflecting partnership working involving all relevant parties; Higher density residential and mixed-use development shall be focused along public transport corridors and in neighbourhood centres with lower densities provided elsewhere to deliver an overall range and choice of housing to meet different needs; and The submission will include a Design and Access Statement (DAS) reviewing the site context and opportunities and constraints of development and illustrating the evolution of the urban and landscape design thinking;	There are no LSEs of this policy on Habitat sites. Policy SP3 centres on development management and specifies that a masterplanning approach will be required for existing and future strategic sites of more than 100 homes. No quanta or locations of development are allocated. Overall, there are no impact pathways present and this policy can thus be screened out from AA.
Policy SP4: Securing Good Quality and Sustainable Design	This policy requires all new development to be of high quality, sustainable design and make a positive contribution to the creation of distinctive and healthy communities, places and spaces by: Character, Legibility, Mixed Use, Accessibility and Permeability, Community safety, Density, Inclusive design Development, Reuse of existing notable buildings, Multi-functional and connected green open spaces, Sympathetically integrating the existing landscape, biodiversity and historic features, Support for energy efficient and climate responsive development, and Resident Amenities Proposals will align with or exceed any minimum standards and should seek to accord with guidance set out separately in relevant SPGs.	There are no LSEs of this policy on Habitat sites. Policy SP4 secures good quality and sustainable design in developments across Cardiff County. This includes wording on accessibility / permeability, greenspaces, community safety, density and other parameters. The policy does not allocate quanta or locations of development. Overall, there are no impact pathways present and this policy can thus be screened out from AA.

Policy	Description	Likely Significant Effects
Policy SP5: Securing New Infrastructure	This policy requires new development to make appropriate provision or contribution for infrastructure in accordance with Planning Policy Guidance. Such infrastructure will be delivered in a timely manner to meet the needs of existing and planned communities and includes the following aspects which may be required having regard to the nature, scale and location of the proposed development and any current under-provision:	There are no LSEs of this policy on Habitat sites. Policy SP5 ensures that new developments will deliver or contribute to adequate levels of infrastructure, which includes essential / enabling and necessary infrastructure types. However, a general requirement for adequate infrastructure has no negative bearing on the Conservation Objectives of Habitst sites. The policy does not allocate quanta or locations of development. Overall, there are no impact pathways present and Policy SP5 can thus be screened out from AA.
Policy SP6: Securing Planning Obligations	Planning obligations will be sought to mitigate any impacts directly related to the development and will be assessed on a case-by-case basis in line with Planning Policy Guidance.	There are no LSEs of this policy on Habitat sites. Policy SP6 is a development management policy that secures planning obligations to mitigate any development-related impacts. However, this general principle has no negative bearing on the Conservation Objectives of Habitat sites. The policy does not allocate quanta or locations of development. Overall, there are no impact pathways present and Policy SP6 can thus be screened out from AA.
Policy SP7: Supporting Placemaking Plans	This policy supports the creation of non-statutory community Placemaking Plans which support and deliver the replacement LDP as supplementary planning guidance.	There are no LSEs of this policy on Habitat sites. Policy SP7 supports the creation of community place plans as supplemental planning guidance where this delivers the Local Plan. Overall, there are no impact pathways present and Policy SP7 can thus be screened out from AA.
Policy SP8: Supporting the Central and Bay Business Area	The following uses are considered appropriate within the Central and Bay Business Areas: B.1.1 New offices, Commercial leisure uses within the Central and Bay Business Areas; B.1.2 Residential uses above ground floor level and/or where it does not result in the loss of a ground floor commercial unit within the Central and Bay Business Areas. B.1.3 Enhanced retail, leisure and complementary facilities within the Central Retail and Commercial Area; and	There are no LSEs of this policy on Habitat sites. Policy SP8 supports the Central and Bay Business Areas by considering a range of appropriate uses. However, its focus is clearly on development management as it does not allocate quanta or specific locations for employment development. Therefore, the policy has no negative bearing on the Conservation Objectives of Habitat sites. Overall, there are no impact pathways present and Policy SP8 can thus be screened out from AA.

Policy	Description	Likely Significant Effects
	B.1.4 Other uses most appropriately located in city centres, including uses that support the night time economy and music scene.	
Policy SP9: Supporting the Role of Cardiff Port	Cardiff Port shall continue its primary role through the provision of traditional port specific employment activities. Further employment generating activities, including the provision of industrial and logistical uses, and green energy generation will be supported. There will also be flexibility to allow leisure, residential and mixed uses, within appropriate areas provided they are compatible with surrounding (port-related) uses.	Likely Significant Effects (LSEs) of this policy on Habitat sites cannot be excluded. Policy SP9 supports the role of Cardiff Port in the economy of the authority. It also specifies a range of employment types that will be allowed, including traditional port-specific employment, industrial and logistical uses, and leisure, residential and mixed uses. Therefore, while no specific locations within the port are identified, it is considered that this policy could impact on the Conservation Objectives of Habitat sites. A range of potential impact pathways is associated with the policy: • Recreational pressure • Loss of functionally linked habitat • Atmospheric pollution • Water quality • Water quantity, level and flow Due to these linking impact pathways Policy SP9 is screened in for Appropriate Assessment (AA).
Policy SP10: Tourism	Appropriate sustainable tourism developments to build upon Cardiff's role as a Capital City and a major tourist, arts, cultural and sporting destination will be supported and promoted where proposals meet with all other relevant LDP policies. Tourism development linked to regeneration initiatives will be promoted including: • A new 17,000-seater Indoor Arena in Cardiff Bay. • Redevelopment of Metro Central and Central Quay. • Redevelopment of the Canal Quarter, including reopening the canal and creating new public and commercial spaces on Churchill Way. • A new velodrome as part of a new phase of development in the International Sports Village.	Likely Significant Effects (LSEs) of this policy on Habitat sites cannot be excluded. Policy SP10 supports sustainable tourism developments in Cardiff City where they accord with all other relevant policies. Current specific proposals that are supported include a new 17,000 seater Indoor Arena in Cardiff Bay, redevelopment of the Quay area and Canal Quarter, and a new velodrome in the Sports Village. A range of potential impact pathways is associated with the policy:

Policy	Description	Likely Significant Effects
		• Recreational pressure • Loss of functionally linked habitat • Water quality • Water quantity, level and flow Due to these linking impact pathways Policy SP10 is screened in for Appropriate Assessment (AA).
Policy SP11: Maintaining a Supply of Minerals	Cardiff will maintain a steady and adequate supply of minerals and contribute to regional aggregate supplies by: i. Promoting and supporting the efficient use of minerals and use of alternatives to naturally occurring minerals including the re-use of secondary aggregates; ii. Protecting existing mineral reserves and safeguarding potential resources of limestone and sand and gravel from development that would preclude their future extraction; iii. Maintaining a minimum 10-year land bank of permitted crushed rock aggregate reserves in line with national guidance; iv. Supporting appropriate applications for sand and gravel extraction; and v. Safeguarding wharves from development that would prevent their use for landing marine dredged sand and gravel. vi. Ensuring the reinstatement of the site to a condition fit for an appropriate after-use supported, where relevant by adequate after-care proposals.	There are no LSEs of this policy on Habitat sites. Policy SP11 maintains a supply of minerals within Cardiff. It promotes the efficient use of minerals, protects existing mineral reserves and safeguards wharves from development that would prevent their use for landing marine dredged sand and gravel. While it expresses broad support for appropriate applications for sand and gravel extraction, no specific locations or numbers of plants are mentioned. Therefore, the policy has no negative bearing on the Conservation Objectives of Habitat sites. Overall, there are no impact pathways present and Policy SP11 can thus be screened out from AA.

Policy	Description	Likely Significant Effects
Policy SP12: Delivering Sustainable Neighbourhoods, Social Cohesion and Affordable Housing	To ensure liveable, efficient, well balanced and cohesive communities, with improved quality of life and access to employment opportunities and affordable housing, the creation of sustainable neighbourhoods will be promoted and enhanced. This will be achieved through: i. Providing a range of dwelling sizes, tenures, types and locations that meet the full range of housing needs, particularly affordable accommodation, accommodation that meets the needs of an ageing population, and family units to meet the needs of children and young people. Provision will also be made for the accommodation needs of Gypsy and Travellers; ii. Supporting the vitality, viability and attractiveness of existing District and Local Centres and their regeneration, including retail and other commercial development and housing of an appropriate scale; iii. Encouraging the provision of a full range of social, health, play, leisure and education facilities and community infrastructure for both existing and new communities that are accessible to all by walking and cycling and public transport; iv. Supporting the regeneration of deprived communities within the city and maximising the additional benefits that new communities can bring to adjoining or surrounding communities; v. Encouraging the enhancement of communities through better equality of access to services for all, including people with disabilities, providing assisted living, providing facilities that support the Welsh Language, promoting cultural and wider diversity for all groups in society, and creating places that encourage social interaction and cohesion; vi. Designing out crime and creating communities which are safer and feel safer; and vii. Establishing strict controls for the sub-division of existing homes, including flat conversions and HMOs.	There are no LSEs of this policy on Habitat sites. Policy SP12 delivers sustainable neighbourhoods, social cohesion and affordable housing. It focuses on development management by addressing such topics as dwelling sizes, dwelling types, leisure and education facilities, access to services, cultural and sporting facilities and others. However, it allocates no quanta or locations of residential and employment development. Therefore, the policy has no negative bearing on the Conservation Objectives of Habitat sites. Overall, there are no impact pathways present and Policy SP12 can thus be screened out from AA.

Policy	Description	Likely Significant Effects
Policy SP13: Securing Health and Well-Being and Resilience	The LDP will seek to promote economic, social, cultural and environmental benefits and reduce health and wellbeing inequalities through creating accessible and healthy environments. It will contribute to health by encouraging healthy lifestyles, addressing the social determinants of health, providing accessible health care facilities and supporting the post pandemic recovery. This will be achieved by supporting developments which take a placemaking approach, including providing for active travel, community spaces, a range of housing according to population need, accessible and useable green and blue spaces, and access to healthy food retail and growing environments.	There are no LSEs of this policy on Habitat sites. Policy SP13 is a development management policy that secures health, well-being and resilience. It strives to create a healthier place to live by supporting accessible / healthy environments, accessible health care facilities, active travel and community spaces. However, it allocates no quanta or locations of residential and employment development. Therefore, the policy has no negative bearing on the Conservation Objectives of Habitat sites. Overall, there are no impact pathways present and Policy SP13 can thus be screened out from AA.
Policy SP14: Protecting and Enhancing Built Heritage and Culture	Cardiff's distinctive heritage assets will be protected, managed and enhanced, in particular archaeological remains and the character and setting of its Scheduled Ancient Monuments; Listed Buildings; Registered Historic Landscapes, Parks and Gardens; Conservation Areas; Locally Listed Buildings and other features of local interest that positively contribute to the visual and cultural distinctiveness of the city.	There are no LSEs of this policy on Habitat sites. Policy SP14 is a development management policy that protects, manages and enhances Cardiff's distinctive heritage assets (e.g. archaeological remains, Scheduled Ancient Monuments, Listed Buildings and others). However, the policy allocates no quanta or locations of residential and employment development. Therefore, the policy has no negative bearing on the Conservation Objectives of Habitat sites. Overall, there are no impact pathways present and Policy SP14 can thus be screened out from AA.
Policy SP15: Securing and Enhancing Opportunities to Grow the Welsh Language	The Cardiff Local Authority area is an Area of Linguistic Importance, the LDP supports development proposals that seek to protect, enhance and promote the interests of the Welsh language to support a Bilingual Cardiff. Where appropriate, development proposals are expected to identify positive measures that enhance the interests of the Welsh language, that increase the opportunities to speak the language on a daily basis as well as identify any mitigation measures in the case of adverse effects. Land use proposals that have a significant adverse or disadvantageous effect on the viability and vitality of the Welsh language and Welsh culture will not be permitted – unless there are specific measures that strengthen the positive impacts and/or remove/mitigate the negative impacts.	There are no LSEs of this policy on Habitat Sites This policy is a development management policy which encourages development to seek opportunities to enhance the interests of the Welsh language The policy allocates no quanta or locations of residential and employment development. Therefore, the policy has no negative bearing on the Conservation Objectives of Habitat sites. Overall, there are no impact pathways present and Policy SP15 can thus be screened out from AA.

Policy	Description	Likely Significant Effects
Policy SP16: Protecting the Setting of the City Through a Green Wedge	To strategically manage the urban form of Cardiff and to protect the setting of the urban area, a Green Wedge is proposed on land North of the M4. Within this area development which prejudices the open nature of this land will not be permitted. Positive biodiversity, landscape, climate change mitigation and informal recreational management and enhancement measures will be encouraged in this area to further enhance the long-term role of the area as a key natural resource benefiting the city.	There are no LSEs of this policy on Habitat sites. Policy SP16 is a development management policy that manages the urban form of Cardiff by establishing a Green Wedge on land north of the M4. Furthermore, positive biodiversity and informal recreational management and enhancement measures are promoted in this area. However, the policy allocates no quanta or locations of residential and employment development. Therefore, the policy has no negative bearing on the Conservation Objectives of Habitat sites. Overall, there are no impact pathways present and Policy SP16 can thus be screened out from AA.
Policy SP17: Managing Spatial Growth Through Settlement Boundaries	To strategically manage the spatial growth of Cardiff, settlement boundaries are proposed. In all areas outside the defined settlement boundaries, otherwise referred to as countryside, there will be a corresponding presumption against inappropriate development.	There are no LSEs of this policy on Habitat sites. Policy SP17 is a development management policy that manages spatial growth through settlement boundaries to prevent the countryside from inappropriate development. This is a positive policy because it safeguards greenfield sites in the countryside, which may be utilised by overwintering SPA / Ramsar birds. The policy allocates no quanta or locations of residential and employment development. Therefore, the policy has no negative bearing on the Conservation Objectives of Habitat sites. Overall, there are no impact pathways present and Policy SP17 can thus be screened out from AA.
Policy SP18: Delivering Sustainable Transport and Active Travel	Development will be integrated with transport infrastructure and services and expected to help to: 1) Achieve the target for 75% of all journeys to made by sustainable transport modes by 2030 as detailed in the Cardiff Transport White Paper; 2) Improve the wellbeing of Cardiff residents with developments following with the goals in the Wellbeing of Future Generations (Wales) Act, Llwybr Newydd: the Wales Transport Strategy 2021, and the Cardiff Local Wellbeing Plan; 3) Reduce travel demand and dependence on the car; 4) Enable and maximise use of sustainable and active modes of transport; 5) Integrate travel modes;	There are no LSEs of this policy on Habitat sites. Policy SP18 is a sustainable transport and active travel policy that ensures the integration of development with transport infrastructure. For example, it seeks to reduce travel demand and dependence on the car, and maximises the use of sustainable / active travel modes. This is potentially a positive policy for Habitat sites as it may reduce the volume of commuter traffic adjoining sensitive habitats. The policy allocates no quanta or locations of residential and employment development. Therefore, the policy has no negative bearing on the Conservation Objectives of Habitat sites. Overall, there are no impact pathways present and Policy SP18 can thus be screened out from AA.

Policy	Description	Likely Significant Effects
	6) Provide for people with particular access and mobility requirements; 7) Improve safety for all travellers; 8) Improve the place making function of transport infrastructure; 9) Maintain and improve the efficiency and reliability of the transport network; 10) Improve air quality; 11) Support the movement of freight by rail or water; and 12) Manage freight movements by road, minimise their impacts and where possible transfer long-haul freight to electric vehicles, smaller vans or e-cargo bikes for last-mile deliveries via. multi-modal hubs.	
Policy SP19: Securing New Transportation Infrastructure	Developments that demonstrate contribution and alignment with the following new infrastructure projects in Cardiff will be supported: • North West Corridor • North and South East Corridors • South West Corridor • Northern Corridor • Eastern Bay Link. • St Mellons rail interchange including Park and Ride.	Likely Significant Effects (LSEs) of this policy on Habitat sites cannot be excluded. Policy SP19 secures new transportation infrastructure projects in Cardiff, including the Regional express bus project, in the North West Corridor, North and South East Corridors and South West Corridor. While many of the options that are explored are positive in principle (e.g. public transport linkages and active travel modes), impact pathways linking to Habitat sites may arise particularly in the construction period of schemes. Therefore, while no specific locations for these transport projects are identified, it is considered that this policy could impact on the Conservation Objectives of Habitat sites. A range of potential impact pathways is associated with the policy: • Recreational pressure • Loss of functionally linked habitat • Atmospheric pollution • Water quality

Policy	Description	Likely Significant Effects
		• Water quantity, level and flow Due to these linking impact pathways Policy SP19 is screened in for Appropriate Assessment (AA).
Policy SP20: Securing Climate Resilience, De-Carbonisation and Renewable Energy in New Developments	To mitigate against the causes of climate change and to adapt to the effects of climate change, development proposals must follow the energy hierarchy and demonstrate how they have worked towards: i. Preventing development that places an additional de-carbonisation burden on the city; ii. Following the Energy Hierarchy principles reducing construction and operation carbon emissions to the lowest viable means having assessed a full range of options; iii. Protecting and increasing carbon sinks through protection of soils and vegetation and increasing tree planting; iv. Adapting to the implications of climate change at both a strategic and detailed design Level; v. Increasing energy efficiency and the supply of renewable energy vi. Preventing development that increases flood risk; and vii Reducing the impact of heat.	There are no LSEs of this policy on Habitat sites. Policy SP20 secures resilience, de-carbonisation and renewable energy in the face of climate change. It sets a range of positive targets, including the protection of soils and vegetation, increased energy efficiency and reducing flood risk. The policy allocates no quanta or locations of residential and employment development. Therefore, the policy has no negative bearing on the Conservation Objectives of Habitat sites. Overall, there are no impact pathways present and Policy SP20 can thus be screened out from AA.

Policy	Description	Likely Significant Effects
Policy SP21: Protecting, compensating and Enhancing Green Infrastructure and Biodiversity	Green (to include blue and aerial) infrastructure provides nature-based solutions to a range of environmental and societal issues, such as the climate emergency, nature emergency, flooding, air pollution, urban heat island effects, public health and mental well-being. Green infrastructure/ biodiversity assets are key to Cardiff's character, value, distinctiveness, and sense of place. Cardiff's green infrastructure assets include: i. Undeveloped countryside and coastline. ii. Non-statutory to statutorily protected sites. iii. Priority/protected habitats and species, and the general range of species across Cardiff. iv. Landscape, geological and heritage features which contribute to the Cardiff's setting. v. Hydrological networks including strategically important river valleys of the Ely, Taff, Nant Fawr and Rhymney, streams, lakes and ponds. vi. Trees, woodlands and hedgerows. vii. Soils. viii. Roadside verges, roundabout islands and screen planting along roads. ix. Strategic recreational routes, cycleways and the public rights of way network. x. A range of active and disused railway lines, providing habitat connectivity throughout. xi. Parks, playing fields, green play areas and open green spaces with opportunities to play. xii. Growing spaces including allotments, community orchards and private gardens. xiii. Freshwater habitats such as Cardiff Bay, Llanishen and Lisvane Reservoirs, and a network of ponds throughout the city, and xiv. Holistic integrated surface water management systems. Development will be expected to protect and enhance the integrity, extent, diversity, quality and connectivity of green infrastructure assets; provide multi-functional green spaces; provide "Net Benefits for Biodiversity"; and ensure the resilience of ecosystems can be maintained. A Green Infrastructure Assessment will be required for all significant development proposals.	There are no LSEs of this policy on Habitat sites. Policy SP21 protects and enhances Cardiff's Green and Blue Infrastructure and biodiversity. This includes several elements, such as the undeveloped countryside / coastline, strategically important river valleys, designated sites, strategic recreational routes (e.g. cycleways and the Public Right of Way (PRoW)). Overall, Policy SP20 is key for the protection of Habitat sites (e.g. the Severn Estuary SPA / Ramsar / SAC) as it requires development proposals to protect and enhance the natural environment. The policy allocates no quanta or locations of residential and employment development. Therefore, the policy has no negative bearing on the Conservation Objectives of Habitat sites. Overall, there are no impact pathways present and Policy SP21 can thus be screened out from AA.

Policy	Description	Likely Significant Effects
Policy SP22: Minimising Impacts on Natural Resources	In the interests of the long-term sustainable development of Cardiff, development proposals must take full account of the need to avoid impacts on the city's natural resources and minimise pollution, in particular the following elements: i. Safeguarding the best and most versatile agricultural land; ii. Safeguarding water resources and improving water quality, including underground surface and coastal waters; iii. Reducing noise and air pollution from industrial, domestic and road transportation sources and managing air quality; and iv. Remediating land contamination through the redevelopment of contaminated sites.	There are no LSEs of this policy on Habitatsites. Policy SP22 minimises impacts on natural resources, such as the quality and quantity of water resources (including groundwater and coastal waters). Furthermore, air pollution from industrial, domestic and road transportation sources is to be minimised. This is a positive for Habitat sites because it addresses two of the impact pathways that are important for Habitat sites in the authority, including water quality, water quantity / level / flow and atmospheric pollution. While the mitigation delivered by this policy is broad, it nonetheless provides benefit to Habitatn sites. The policy allocates no quanta or locations of residential and employment development. Therefore, the policy has no negative bearing on the Conservation Objectives of Habitat sites. Overall, there are no impact pathways present and Policy SP22 can thus be screened out from AA.
Policy SP23: Managing Waste	Waste arisings from Cardiff will be managed by: i. Supporting waste prevention and reuse and the provision of facilities that use recycled or composted products. ii. Promoting and supporting additional sustainable waste management facilities in a manner that follows the waste hierarchy and the principles of an integrated and adequate network of waste installations; nearest appropriate installation; self-sufficiency and protection of human health and the environment; iii. Encouraging the provision of in-building treatment facilities on existing and allocated areas of general industry; and iv. Supporting the provision and maintenance of sustainable waste management storage and collection arrangements in all appropriate new developments;	There are no LSEs of this policy on Habitat sites. Policy SP23 sets out measure to limit the generation of waste from Cardiff, including support for recycling and composting materials as well as encouraging waste treatment within industrial developments. The policy allocates no quanta or locations of residential and employment development. Therefore, the policy has no negative bearing on the Conservation Objectives of Habitat sites. Overall, there are no impact pathways present and Policy SP23 can thus be screened out from AA.
H1A: Strategic Housing sites	This policy allocates strategic sites for housing development. This allocation amounts to a total of 63.56ha of land, for the provision of 1,675 estimated dwellings. These allocations are examined individually in table 5-2.	Likely Significant Effects Policy H1A allocates land for the development of 1,675 new additional dwellings (over the plan period. A range of potential impact pathways is associated with the policy: • Recreational pressure • Loss of functionally linked habitat

Policy	Description	Likely Significant Effects
		• Atmospheric pollution • Water quality • Water quantity, level and flow Due to these linking impact pathways Policy H1A is screened in for Appropriate Assessment (AA).
H1B: Non-Strategic Housing Sites	This policy allocates non-strategic sites for housing development. At time of writing this policy amounts to 7.38ha of land for the provision of 240 estimated dwellings. These allocations are examined individually in table 5-2.	Likely Significant Effects Policy H1B allocates land for the development of 1,454 new additional dwellings over the plan period. A range of potential impact pathways is associated with the policy: • Recreational pressure • Loss of functionally linked habitat • Atmospheric pollution • Water quality • Water quantity, level and flow Due to these linking impact pathways Policy H1B is screened in for Appropriate Assessment (AA).
H2: Housing Led Regeneration Areas	The following sites are identified as housing led regeneration areas that provide high density, sustainable, mixed use development which maximises affordable housing providing an estimated total of 4,751 dwellings over 77.11ha of land: H2.1 International Sports Village H2.2 Whitchurch Hospital/Velindre Site H2.3 Cardiff Gate Business Park (West) H2.4 Roath Dock (North side) H2.5 Porth Teigr and Alexandra Head H2.6 Hadfield Road H2.7 Callaghan Square	Likely Significant Effects Policy H2 identifies 7 areas as housing led regeneration areas. A range of potential impact pathways is associated with the policy: • Recreational pressure • Loss of functionally linked habitat • Atmospheric pollution • Water quality

Policy	Description	Likely Significant Effects
		• Water quantity, level and flow Due to these linking impact pathways Policy H2 is screened in for Appropriate Assessment (AA).
H3: Affordable Housing	This policy requires developers to provide affordable housing with a 20% affordable housing rate on brownfield sites and a 30% rate on greenfield sites	No Likely Significant Effects This policy does not provide for a quantum of housing, it is a development management policy ensuing a diversity of housing where housing will be provided.
H4: Conversions to Flats	This policy prevents the conversion of properties to flats unless it meets criteria including suitable residential amenity and space and, no material harm to the amenity of existing nearby residents and there are dedicated and adequate storage facilities for cycles, waste and recycling. .	No Likely Significant Effects This is a development management policy that prevents the conversion on existing buildings to residential use unless certain criteria are met. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
H5: Houses in Multiple Occupancy	This policy permits conversion to Houses in Multiple Occupation provided they meet criteria including: Proposals not leading to an excess of HMOs within a 50 meter radius Proposals for any conversion to Houses in Multiple Occupation will only be permitted where there will be: suitable residential amenity and space for residents, No material harm to the amenity of existing nearby residents There is adequate cycle and waste management storage facilities that doesn't harm amenity.	No Likely Significant Effects This is a development management policy that prevents the conversion on existing buildings to HOMs unless certain criteria are met. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
H6: Student Accommodation	This policy prevents the development of student accommodation unless it meets certain criteria. These include: Being located in Central and Bay Business Area or in close proximity to existing university and college campuses. Having appropriately sized and functionally designed individual rooms. Including sufficient communal facilities and services. Being of high-quality design.	No Likely Significant Effects This is a development management policy that prevents the development of student accommodation unless certain criteria are met. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
H7: Co-living Accommodation	This policy sets criteria for the development of co-living schemes. These include: Being located in sustainable locations Including homes for rent with a minimum tenancy of at least 3 months. Include private studios and shared facilities. Provide adequate cycle storage	No Likely Significant Effects This is a development management policy that controls the development of student accommodation unless certain criteria are met. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.

Policy	Description	Likely Significant Effects
H8: Change of use of Residential Land or Properties	This policy controls the conversion or redevelopment of residential properties to other uses. This will only be permitted where the location is no longer suitable for residential use or the proposal is needed for a necessary community use and there would be no unacceptable impact on residential amenity.	No Likely Significant Effects This is a development management policy that limits redevelopment of residential land. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
H9: Change of Use or Redevelopment to Residential Use on Unallocated Sites	This policy prevents the change of use of redundant premises or previously developed land for housing unless: There is no overriding need to retain the existing use of the land or premises and no overriding alternative local land use requirement; The resulting housing will be satisfactory; There will be no unacceptable impact on existing businesses; Necessary community and transportation facilities are accessible or can be readily provided or improved; and It has been assessed in terms of land contamination risk and that there are no unacceptable risks to the end users. The residential accommodation is accessible by walking, cycling or public transport.	No Likely Significant Effects This is a development management policy that limits redevelopment of redundant premises and previously developed land for residential uses. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
H10: Sites for Gypsy and Traveller Caravans	Policy requires new sites and extensions for gypsy and traveller accommodation to: Have access via sustainable transport to necessary physical, transport and social infrastructure. Be appropriate regarding environmental factors. Be designed referencing government guidance. Not have unreasonable impact on surrounding areas. Have good access to the primary highway network.	No Likely Significant Effects This is a development management policy that controls the development and extension of gypsy and traveller sites. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
H11: Gypsy and Traveller Site	This policy allocates land for the provision of Gypsy and Traveller temporary accommodation at Pengam Green.	Likely Significant Effects It is expected that this site would provide approximately 80 plots. A range of potential impact pathways is associated with the policy: • Recreational pressure • Loss of functionally linked habitat • Atmospheric pollution • Water quality • Water quantity, level and flow

Policy	Description	Likely Significant Effects
		Due to these linking impact pathways Policy H11 is screened in for Appropriate Assessment (AA).
EC1: Cardiff Central Enterprise Zone and Regional Transport Hub	This policy designates the Cardiff Central Enterprise Zone and Regional Transport Hub for the retention, development and redevelopment of land for employment opportunities focussed on financial and professional services sectors, an integrated regional public transport hub, high density residential units together with a diversity of complementary mixed uses, including commercial, leisure and service uses where they support regeneration , renewal and enhancement and contribute to the vitality, attractiveness and viability of the CEZ	No Likely Significant Effects This is a development management policy that supports the use of Cardiff Central Enterprise Zone and Regional Transport Hub for use as employment land. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
EC2: Land South of St Mellons Business Park	This policy allocates land South of St Mellons Business Park for a strategic employment site comprising up to 90,000 square metres of B1, B2 and B8 uses, ancillary uses and infrastructure associated with; biodiversity; landscape; drainage; walking, cycling and other transport modes. together with the construction of a new transport hub facility, and associated infrastructure works.	Likely Significant Effects It is expected that this site would provide approximately 80 plots. A range of potential impact pathways is associated with the policy: • Loss of functionally linked habitat • Atmospheric pollution Due to these linking impact pathways Policy EC2 is screened in for Appropriate Assessment (AA).
EC3: Protected Employment Land and Premises	This policy protects certain areas as designated protected employment areas. These areas are protected for B Use Class Employment and ancillary/complementary uses.	No Likely Significant Effects This is a development management policy that protects certain areas for the development of B Use Class employment and ancillary uses. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
EC4: Provision of Complementary Facilities for Employees in Business Industrial and Warehousing Developments	This policy states that complementary uses including open space, leisure, food and drink and child-care facilities are acceptable in office, industrial and warehousing developments provided the facility is appropriately sized to primary serve the needs of workers in the vicinity	No Likely Significant Effect This is a development management policy requiring ancillary uses of employment land to be appropriate to the employment space. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
EC5A: Alternative Use of Protected Employment Land and Premises	This policy prevents use of protected employment land for other non-complementary uses unless: There is no need to retain the land for it's designated use There is no prospect of employment use of the site and/or the property is unsuitable for such use There will be no unacceptable impact on existing businesses	No Likely Significant Effect This is a development management policy preventing the use of protected employment land from other uses unless certain criteria are met. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
EC5B: New Workspace Within Mixed Use Development	This policy states that where the criteria of EC5A (i to iii) have been satisfied, and an alternative use is considered appropriate; provision should be made for new employment workspace and community facilities as part of a mixed-use residential redevelopment.	No Likely Significant Effect

Policy	Description	Likely Significant Effects
	The new employment workspace provided should be in the form of accommodation for research and development, affordable workspace, light industrial, flexible office space, local distribution, or similar premises and may include premises for professional services and medical or health services.	This is a development management policy requiring mixed use developments in employment areas to be of a suitable type. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
EC6: Protecting Offices in the Central and Bay Business Areas	This policy prevents alternate use of central and bay business area offices unless there is no need to retain the site and proposals retain a significant element of office and/or commercial floorspace as part of mixed use development.	No Likely Significant Effect This is a development management policy preventing the alternate use offices within the central and bay area. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
EC7: Alternative use of Employment Land and Premises not Identified within Policy EC3 (Protected Employment Land) or Policy EC6 (Protecting Offices in the Central and Bay Business Area)	This policy states that alternative uses for land and premises outside of the designated employment protection areas for residential development and/or mixed use will be favourably considered provided that the site is vacant or redundant and residential proposals meet required criteria	No Likely Significant Effect This is a development management policy that supports the use of employment land outside of designated employment land for residental and mixed-use purposes. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
EC8: Employment Proposals on Land Not Identified For Employment Use	This policy ensures employment proposals for unallocated sites: Cannot reasonably be accommodated on existing employment land Fall within the settlement boundary and have no specific policy designation Are compatible with the surrounding area Is accessible via sustainable travel and the primary highway network.	No Likely Significant Effect This is a development management policy that sets criteria for the development of employment proposals on unallocated sites. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
EC9: Hotel Development	The policy favours proposals for hotel development within the Central and Bay Business Areas and within designated centres provided they are of an appropriate scale and abide by legislation. Outside of these locations, proposals for major hotel development, including extensions and changes of use will be assessed against other local plan policies.	No Likely Significant Effect This is a development management policy that favours the development of hotels to certain areas. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
EC10: Night-time and Cultural Economy	This policy favours proposals for leisure, entertainment, and cultural uses in: The City Centre (Central Business Area) The inner harbour/waterfront area of Cardiff Bay (Bay Business Area) The International Sports Village Atlantic Wharf and; District and Local Centres (of a scale and nature appropriate to the centre). The loss of Use Class D2 venues and public houses (Use Class A3) will be resisted unless it is demonstrated that the use is no longer viable, and the premises cannot accommodate another similar use.	No Likely Significant Effect This is a development management policy that favours the development of leisure, entertainment and cultural uses in certain areas. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.

Policy	Description	Likely Significant Effects
D1: Tall Buildings	This policy sets requirements on the development of any tall buildings. These include: Not harming the local character of parks and gardens, listed buildings or conservation areas. Contribute to the townscape and enhance biodiversity. Account for the needs of the people Provide reasonable living space and residential amenity for residents	No Likely Significant Effect This is a development management policy that set criteria for the development of tall buildings in order to ensure that they are beneficial for the area. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
R1: Retail Hierarchy and Town Centre First Approach	This policy sets out a hierarchy for the purpose of focussing proposals for retail development, having regard for the nature of the development. This policy supports active uses that contribute to the diversity of centres, and residential development that makes positive use of upper floors and vacant space away from commercial frontages.	No Likely Significant Effect This is a development management policy that sets out a retail hierarchy for the district and local centres within the plan area. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
R2: Development in the Central Retail and Commercial Area	This policy sets out criteria to assess development proposals within the Central Retail and Commercial Area including whether: There is a loss of shop uses from within Protected Shopping Frontages; The proposal involves retail and other uses which enhance the vitality, viability and attractiveness of the city centre; The development allows for, or retains the effective use of, upper floors; and Supports the regeneration, renewal and enhancement of the city centre.	No Likely Significant Effect This is a development management policy that sets criteria for proposals within the Central Retail and Commercial Area. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
R3: Protected Shopping Frontages	This policy sets out criteria to assess proposals resulting in the loss of shop uses within Protected Shopping Frontages including: The balance of existing non-shop uses The lost shop floor space, location and prominence. The proposed use and it's impact on adjacent and nearby residents	No Likely Significant Effect This is a development management policy that sets criteria for proposals that result in the loss of protected shop frontages. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
R4: District Centres	This policy favours retail, facilities and residential proposals in district centres provided that: The proposal is suitable for the given centre. Upper floors are able to be utilised with any offices located on upper floors They do not result in unacceptable harm Community facilities provide benefit outweighing the loss of retail space Residential development is located away from commercial frontages	No Likely Significant Effect This is a development management policy that sets criteria for retail developments within district centres. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
R5: Local Centres	This policy favours retail, facilities and residential proposals in district centres provided that: The proposal is suitable for the given centre. Upper floors are able to be utilised with any offices located on upper floors They do not result in unacceptable harm Community facilities provide benefit outweighing the loss of retail space	No Likely Significant Effect This is a development management policy that sets criteria for retail developments within local centres. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.

Policy	Description	Likely Significant Effects
	Residential development is located away from commercial frontages	
R6: Town Centre First Approach	This policy permits retail and commercial developments out of centre only where: It can be established there is need for the proposed floorspace The proposal would not cause unacceptable harm to the central retail and commercial area, district or local centre. The site is accessible The proposal is not on land allocated for other uses	No Likely Significant Effect This is a development management policy that sets criteria for retail developments outside of district and local centres. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
R7: The Creation of New Centres	This policy supports the development of new centres where: The development is of an appropriate scale to meet local need The development will not negatively impact designated centres The development is located along public transport routes and accessible by walking and cycling	No Likely Significant Effect This is a development management policy that sets criteria for the creation of new centres. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
R8: Food and Drink Uses	This policy states that food and drink uses are most appropriately located in the City Centre, Inner harbour/waterfront area of Cardiff Bay, and District and Local Centres	No Likely Significant Effect This is a development management policy that encourages the development of food and drinks uses to be located in existing centres. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
R9: Conversion to Residential	This policy supports the conversion of vacant space above commercial properties in the Central and Bay Business Area, District and Local Centres, to residential use where: The ground floor frontage is retained in commercial use; Adequate servicing and security can be maintained to the existing commercial use(s); Appropriate provision can be made for parking, access, pedestrian access, amenity space, green infrastructure and refuse disposal together with any appropriate external alterations; The residential use does not compromise the ground floor use and result in unacceptable impact on the operating conditions of existing businesses.	No Likely Significant Effect This is a development management policy that sets criteria for the conversion of vacant space above retail properties into residential accommodation. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
C1: Community Facilities	This policy supports new and improved community facilities within the settlement boundary provided the facility: is accessible to the local community. Would not prejudice residential occupants or detract from the local area Would not lead to unacceptable parking or traffic problems. Is designed with flexibility and adaptability	No Likely Significant Effect This is a development management policy that sets criteria for the development of new community facilities. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
C2: Protection of Community Facilities	This policy does not support the loss of community facilities unless it meets one of the following criteria: There is an alternative facility in the vicinity or one will be provided The use is no longer viable Existing provision is surplus to requirements Ther community facility can be fully retained, enhanced, or reinstated	No Likely Significant Effect This is a development management policy that sets criteria for the circumstances under which community facilities may be lost. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.

Policy	Description	Likely Significant Effects
C3: Community Safety/Creating Safe Enrionments	This policy requires new development to promote a safe and secure environment including: Maximising natural surveillance Having well defined routes and boundaries Having a good standard of lighting	No Likely Significant Effect This is a development management policy that requires new development to create a safe and secure environment. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
C4: Planning for Schools	This policy states that the council will seek contributions where there is a need for new and improved school facilities, favouring onsite provision.	No Likely Significant Effect This is a policy that seeks contributions for the provision of improved school facilities where this is required. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
HE1: The Historic Environment	This policy concerns safeguarding Cardiff's heritage assets. Development is expected to preserve or enhance impacted heritage assets, providing a Heritage Impact Statement, with any harm to the heritage assets being justified and weighed against the public benefits. Archaeological excavation or historic building recording may still be required even where justified. There are further specific requirements based on type of heritage asset, namely: Archaeology and Scheduled Monuments, Listed Buildings, Conservation Areas, Registered Historic Landscapes, Parks and Gardens, locally listed buildings and non-designated heritage assets.	No Likely Significant Effect This is a policy that seeks to preserve or enhance existing heritage assets. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
HF1: Health Wellbeing and Development	This policy supports developments that encourage health and wellbeing though assorted method. These include but are not limited to: Promoting walking and cycling and public transport access through infrastructure Promoting road safety measures Providing local facilities for community, healthcare and social care Ensuring low levels of air pollution Development will not be permitted if they have an unacceptable impact on health	No Likely Significant Effect This is a positive policy that seeks to improve health and wellbeing. Measures such as promoting walking and ensuring low levels of air pollution would help to minimise the impact of air pollution on Habitat sites This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
HF2: The Provision of Allotments	This policy states that residential developments will be expected to provide or contribute to 1 allotment plot per 45 dwellings	No Likely Significant Effect This is a policy that seeks to provide allotments for local use. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
HF3: Provision of Food Growing Space in New Developments	This policy expects residential developments to provide suitable space for on-site food growing of an appropriate size and scale that is safe for residents to use.	No Likely Significant Effect This is a policy that seeks to provide space for on-site food growing in residential developments. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.

Policy	Description	Likely Significant Effects
HF4: Food Growing Enterprises and Allotments	This policy supports developments that increase the availability of locally grown food, and prevents development resulting the loss of allotments	No Likely Significant Effect This is a policy that supports developments that increase locally grown food. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
WL1: Welsh Language	This policy seeks to protect Welsh speaking in Cardiff by ensuring that development considers Welsh by having bilingual signage and using Welsh names as appropriate. Additionally, they should provide opportunities for Welsh speakers and contribute to the Welsh Government's Welsh language goals where appropriate	No Likely Significant Effect This is a policy that supports developments that support the Welsh language. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
CP1: Countryside Protection	This policy limits development outside of the settlement boundaries to only appropriate countryside uses and respects the area. Significant developments will require a landscape assessment and landscaping scheme. New housing, rural diversification and rural enterprise must comply with national planning policy	No Likely Significant Effect This is a development management policy that limits development outside of the settlement boundaries. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
CP2: Conversion, Extension and Replacement Buildings in the Countryside	This policy resists the conversion, extension and replacement of countryside buildings unless they meet certain criteria. For conversions the conversion must be structurally sound, not materially change the exiting building or harm the countryside, be suitable for use and no give rise to demand for additional buildings. Extensions must be the subordinate part of the existing building; and respect the scale, character and design of the original part of the building. Replacement Buildings must not result in any greater impact on the area in terms of its proposed scale and design, be on the existing building footprint unless justified, not replace buildings of merit.	No Likely Significant Effect This is a development management policy that limits the conversion, extension and replacement of countryside buildings. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
CP3: Landscape Protection	This policy prevents development that would cause unacceptable harm to the character and quality of the landscape and setting of the city.	No Likely Significant Effect This is a development management policy that prevents development that would cause harm to the character and quality of the landscape or setting of the city. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
CP4: River Corridors	This policy prevents development that would cause unacceptable harm to the Ely, Taff, and Rhymney River Corridors. This includes perceived urbanisation and protecting green infrastructure and other key features.	No Likely Significant Effect This is a development management policy that prevents development that would cause harm to the named river corridors. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
BG1: Designated Sites	This policy specifies that developments will only be permitted if they do not cause harm to sites of international or national importance for nature conservation or unacceptable harm to locally designated sites.	No Likely Significant Effect This is a positive policy which clarifies a commitment to fulfil statutory obligations to ensure the protection of Habitat Sites.

Policy	Description	Likely Significant Effects
	For all sites where there is potential for harm, developments will only be accepted where appropriate and proportionate compensation and mitigation measures identify that there is no reduction in the overall nature conservation value of the area or feature. Statutory Nature Conservation Organisations will be consulted in consideration of any international and national sites. The consideration of a Habitat Regulations Assessment – including screening, appropriate assessment or derogations may also be required. All mitigation for such sites, will be realistic and achievable in line with best practice and available scientific evidence.	This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
BG2: Ecological Networks and Features of Importance for Biodiversity	This policy requires development to not cause unacceptable harm to feature of importance for wild flora and fauna and green infrastructure of importance. This policy gives particular emphasis to protection, enlargement, connectivity, management, and enhancement of retained semi-natural habitats.	No Likely Significant Effect This is a positive policy which ensures the protection of wild flora and fauna of importance. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
BG3: Priority Habitats and Species	This policy prevents developments that would have a significant adverse effect on the viability of legally protected habitats and species and those of significant value to Cardiff. They will only be allowed where the development outweighs the nature conservation/ecological value, the developer demonstrates that there is no satisfactory alternative and mitigation measures are suitable.	No Likely Significant Effect This is a positive policy that development management policy that prevents development that would cause harm to legally protected species and those that are of local significance. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
BG4: Net Benefits for Biodiversity and the Green Infrastructure Statement	This policy requires Green Infrastructure (GI) Statements for new developments indicating Net Benefits for Biodiversity can be achieved.	No Likely Significant effect This is a positive environmental policy that requires developments to engage with Net Benefits for Biodiversity. This policy does not set any quantum or allocation for development and therefore has no likely significant effects.
BG5: Trees, Woodlands and Hedgerows	This policy requires proposals to help protect and enhance a sustainable forest and prevents development that results in the permanent removal of and/or significant harm to trees, woodlands, hedgerows unless it is clearly shown that this can be mitigated and/or will achieve significant and clearly defined public amenity benefits.	No Likely Significant effect This is a positive environmental policy that supports the retention of urban trees and hedgerows. This policy does not set any quantum or allocation for development and therefore has no likely significant effects.
BG6: Soils	This policy requires proposals to protect and enhance important soil resources. Permanent sealing or removal of functional soils will not be permitted unless it will achieve significant can clearly defined public amenity benefits.	No Likely Significant effect This is a development management policy which seeks to ensure that important soil resources are protected. This policy does not set any quantum or allocation for development and therefore has no likely significant effects

Policy	Description	Likely Significant Effects
BG7: Severn Estuary and Cardiff Beech Woods Recreational Pressure	Development proposals that would result in an increase in visitor pressure on features of the Severn Estuary SAC, SPA, Ramsar site and Cardiff Beech Woods SAC, impact on functionally linked land with respect of the Severn Estuary Marine Site (EMS), will not be supported unless it can be demonstrated that the integrity of the European Marine Site or Cardiff Beech Woods SAC can be maintained following the HRA staged process.	No Likely Significant Effect This is a positive policy that seeks to enact recommendations in the HRA report.
T1: Prioritising Walking and Cycling	The policy states that planning permission will only be granted for development that minimises the need for travel and is laid out to maximise walking, cycling and public transport. The council will support developments that incorporate active travel facilities and principles, including: Networks of safe, convenient and attractive walking and cycling routes; Connections and extensions to the Cardiff Cycle Network and recreational walking routes; Supporting facilities; The council will also support developments that promote the change to more sustainable modes and innovative measures to overcome existing barriers to active travel and sustainable transport.	No Likely Significant effect This is a positive policy that supports the development of walking and cycling infrastructure. The goal of this policy is to support active travel which would likely lead to a reduction in vehicle traffic and thus lessen the impacts of atmospheric pollution on Habitat Sites. This policy does not set any quantum or allocation for development and therefore has no likely significant effects.
T2: Strategic Rapid Transit, Bus Corridors and Bus Enhancements	This policy states that a development that will add to demands on public transport should contribute towards improvements to bus network infrastructure. The Council will work with its partners to improve the ease and quality of access into and around Cardiff by public transport, by: Ensuring that road space is managed efficiently to support public transport Improving the capacity and attractiveness of Park and Ride; Promoting bus/rapid transit access between major origins and destinations. Ensuring sufficient space is provided particularly within the city centre and district centres.	No Likely Significant Effects This is a beneficial policy that requires the council to work to improve access to Cardiff via public transport. This should assist in reducing the number of vehicles and thus reduce the impact of atmospheric pollution. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
T3: Rail Transport	This policy supports proposals that enhance Cardiff's rail network which meet criteria including accessibility and integration into surrounding areas	No Likely Significant Effects This is a beneficial policy that requires supports enhancements to the Cardiff Rail Network. This should assist in reducing the number of vehicles and thus reduce the impact of atmospheric pollution. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
T4: Managing Transport Impacts	This policy expects new development to demonstrate how the need to travel is reduced and essential travel needs can be met by the use of transport modes other than the private car. Development will be located where: i. It can be served by alternative modes of transport other than the car, such public transport, walking and cycling; ii. The traffic generated can be accommodated by existing or known improvements to highways and where it will not create or add to problems of safety, congestion or damage to the environment;	No Likely Significant Effects This is a policy that requires development to be located in positions where it supports and can be served by beneficial policy that requires the council to work to improve access to Cardiff via public transport. This should assist in reducing the number of vehicles and thus reduce the impact of atmospheric pollution. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.

Policy	Description	Likely Significant Effects
	iii. In the case of residential development, existing or new essential local facilities are within convenient walking distance, and should be within 400m walking distance of public transport services. iv. It makes the best use of existing transport networks and has regard to future transport investment proposals, to enhance the viability of public transport services and future ones identified in the Cardiff Transport Strategy and White Paper; v. It will improve accessibility to existing and new jobs and services by non-car modes of transport; and vi. Development that generates a large number of passenger movements shall be located in main urban areas or at locations that provide convenient access on foot, by cycle and by public transport. The design of development should: vii. Help to create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards; viii. Allow for the efficient delivery of goods, and for access by service and emergency vehicles; ix. Charging of plug-in, shared vehicle services and other ultra-low emission vehicles is enabled in safe, accessible and convenient locations within the development; and x. Not create unacceptable harm to the safe and efficient operation of pedestrian and cycle routes, public rights of way, bridle routes, public transport and the highway. Development that does not support the Well-being of future generations act, Llwybr Newydd: the Wales transport strategy and Welsh government Air Quality and Net Zero Strategies will not be permitted.	
T5: Transport Interchanges	This policy supports the development of: New rail stations which adhere to policy T4; Measures to support interchange between local bus services; Strategically located park-and-ride facilities; High-quality passenger facilities; Facilities for park and share, coach parking, taxis and passenger drop off; Facilities for overnight lorry parking and freight transfer; Facilities for interchange with water-based transport; Strategically located taxi/loading/parking locations with Electric Vehicle charging.	No Likely Significant Effects This is a beneficial policy that requires supports the development of enhancements to public transport interchanges. This should assist in reducing the number of vehicles and thus reduce the impact of atmospheric pollution. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
T6: Cardiff City Region 'Metro' Network	This policy states that the council will seek to facilitate the development of a 'Metro' network of integrated public transport routes and services within Cardiff and connecting the city with the wider southeast Wales region, including rail routes, trams, busses, and active travel routes. The metro will introduce digital measures to support 'Mobility as a Service' (MAAS) initiatives and the upgrading of traffic signals and digital infrastructure. The council will support developments that respond to or incorporate these changes in the future.	No Likely Significant Effects This is a beneficial policy that requires the council to work to develop a metro network of public transport links between Cardiff and the rest of South Wales. This should assist in reducing the number of vehicles and thus reduce the impact of atmospheric pollution.

Policy	Description	Likely Significant Effects
		This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
T7: Electric Vehicle Charging	This policy states that electric vehicle charging should be installed in strategic locations where they don't impede the movement of other modes or have a negative impact on accessibility or upon the needs of vulnerable users.	No Likely Significant Effects This is a beneficial policy that supports the installation of electric vehicle charging points. This should assist in encouraging a shift towards electric vehicles and thus reduce the impact of atmospheric pollution. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
OS1: Protection of Open Space	This policy prevents development on open space unless: It would not cause a deficiency of open space The open space has no amenity value The open space is of no quality Or there is satisfactory compensatory provision. In all cases the development has no adverse impact on green infrastructure/ecology and/ or areas of historic conservation importance	No Likely Significant Effects This is a beneficial policy that protects existing open space within Cardiff. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
OS2: Provision for open space, outdoor recreation, children's play and sport	Provision for open space, outdoor recreation, sport and opportunities for children's play and sport will be sought in conjunction with all new residential developments. This policy is aimed at securing the provision or improvement of open space and other appropriate outdoor recreation, sport and play in conjunction with all new residential developments over 5 units and on site provision of functional open space in conjunction with all new residential developments over 20 units. The appropriate amount of multi-functional green space is based on a minimum of 2.43 hectares of functional open space per 1,000 projected population. All other open space provision, including natural and semi-natural green space will be in addition to the provision of multi-functional green space.	No Likely Significant Effects This is a beneficial policy that seeks to ensure the provision of outdoor space and recreation areas for new developments. This is beneficial as increased availability of outdoor space will help to decrease the potential increase in recreational pressure. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
P1: Play and Informal Recreation	Development proposals for schemes that are likely to be used by children and young people should: i. increase opportunities for play and informal recreation and enable children and young people to be independently mobile; ii. For residential developments, incorporate good-quality, accessible play provision for all ages, genders and abilities that: a) provides a stimulating environment and allows children of all ages to play together in different ways; b) provides appropriate risk and challenge and evolves as children grow; c) forms an integral part of the surrounding neighbourhood and are in the best possible place; d) can be accessed safely from the street by children and young people independently; e) incorporates trees and/or other forms of greenery; f) is overlooked to enable passive surveillance; and g) is not segregated by tenure. iii. incorporate accessible walking and active travel routes for children and young people to existing play provision, schools and youth centres, within the local area, which	No Likely Significant Effects This policy encourages developments that are likely to be used by children and young people to provide opportunities for play and recreation with accessible routes and a stimulating environment. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.

Policy	Description	Likely Significant Effects
	enable them to play and move around their local neighbourhood safely and independently. iv. For large-scale public realm developments, consider opportunities for formal and informal play.	
RE1: Renewable and Low Carbon Energy Development	Renewable energy development is required to support the transition to a low carbon future. Development proposals associated with the generation or, storage or provision of renewable and low carbon energy will be supported where: i. The scale and nature of the development, its construction and infrastructure connections do not cause unacceptable adverse impacts ii. Key, landscape, heritage, cultural and biodiversity features are retained and maintained as part of development and decommissioning proposals. iii. Existing infrastructure or operations, including marine and those related to aviation are maintained. iv. Proposals detail the operation lifespan of the development and include appropriate provisions relating to the decommissioning and removal of infrastructure and apparatus at the end of service, together with proposals for effective land restoration. v. Due consideration has been given to the materials flows generated, such as those required for anaerobic digestion, by the development to ensure the sustainable use and management of resources vi. Proposals are consistent with other policies within the development plan.	No Likely Significant Effects This policy supports the development of generation, storage and provision of renewable and low carbon energy provided proposals meet certain criteria. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
RE2: Net Zero Development	All new build development, on major and strategic sites will be expected to achieve net zero carbon emissions through measures such as maximising energy efficiency, utilising sustainable heating and cooling and incorporating onsite renewable energy generation. All major development proposals must submit an energy statement that: • Follows the stepped approach set out by the energy hierarchy in the design, construction and operation of development • Examines the full range of measures, technologies and opportunities available to achieve Net Zero Development • Demonstrates it aligns with the Local Area Energy Plan and making buildings low carbon Following detailed assessment where Net Zero cannot be achieved for financial reasons proposals should demonstrate how the development is designed and constructed to accommodate adaptations in the future to achieve net zero Where Net zero cannot be achieved for other than financial reasons a financial contribution will be sought to support local carbon reduction projects.	No Likely Significant Effects This is a Development management policy that requires that developer maximise the potential for renewable energy and incorporating renewable and low carbon energy generation. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
W1: Water Sensitive Design	Development should apply water sensitive urban design solutions (the process of integrating water cycle management with the built environment through planning and urban design). To include the management of: I. Water demand and supply; II. Waste water and pollution; III. Rainfall and runoff; IV. Watercourses and water resource	No Likely Significant Effects This is a design management policy which states that development should incorporate water cycle management into their planning and urban design. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.

Policy	Description	Likely Significant Effects
	V. Flooding; and VI. Water pathways. The above will employ nature-based solutions (and thus the improvement of green infrastructure) as a fundamental solution to these challenges, including ecological enhancement	
W2: Protection of Water Resources	Development will not be permitted that would cause unacceptable harm to the quality or quantity of underground, surface or coastal waters.	No Likely Significant Effects This is a beneficial policy which prevents development which would cause unacceptable levels of harm to the quality or quantity of water resources. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
W3: Flood Risk	Development will not be permitted: I. Within tidal or fluvial flood plains unless it can be demonstrated that the site is justified in line with national guidance and an appropriate detailed technical assessment has been undertaken to ensure that the development is designed to alleviate the threat and consequences of flooding over its lifetime; II. Where it would increase the risk of flooding from fluvial and/or tidal flooding or from additional run-off from the development in any location; III. Where it would hinder future maintenance or improvement schemes of flood defences and watercourses; IV. Where it would cause adverse effects on the integrity of tidal or fluvial defences; Proposals involving bedrooms on ground or lower floors in areas liable to flooding are likely unacceptable, unless satisfactory mitigation measures can be demonstrated in accordance with TAN15.. Where appropriate the developer should demonstrate that they have considered the need to incorporate environmentally sympathetic flood risk mitigation measures such as Sustainable Drainage Systems (SUDS), especially capitalising on nature based solutions.	No Likely Significant Effects This policy seeks to minimise flood risk in the local plan area by preventing development in areas either at risk of flooding, that would lead to increased risk of flooding, or that would interfere with flood prevention measures. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
PC1: Air, Noise, light Pollution and Land Contamination	Development will not be permitted where it would cause or result in unacceptable harm to health, local amenity, the character and quality of the countryside, green infrastructure or nature conservation assets, landscape or built heritage importance because of air, noise, light pollution or the presence of unacceptable levels of land contamination.	No Likely Significant Effects This is a positive policy which seeks to prevent development that would lead to harmful levels of air, noise and light pollution. This policy states a commitment to prevent development that would lead to unacceptable harm to nature conservation assets. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
MW1: Mineral Limestone Reserves and Resources	Mineral reserves with planning permission will be safeguarded from development that would prevent their extraction at: **i.** Creigiau Quarry; **ii.** Taffs Well Quarry; **iii.** Ton Mawr Quarry; and **iv.** Blaengwynlais Quarry.	No Likely Significant Effects This is a policy which protects quarries from incompatible development that would sterilise their further extraction. It relates to several quarries that are located within Cardiff Beechwoods SAC. Further quarrying in the SAC could result in direct habitat loss.

Policy	Description	Likely Significant Effects
	A Preferred Area of known resource suitable for the future working of Limestone has been identified as an extension to Ton Mawr Quarry.	However, this policy does not allocate any sites or quantum of development, and safeguarding of resources does not carry with it any assumption the resources will be worked or when. Moreover, all these reserves already have planning consent. Moreover, there are no further planning applications to extend the lateral extent of the four quarries around the Cardiff Beechwoods SAC and no proposals for such in the Local Plan. There are current planning applications to deepen Taffs Wells Quarry by a further 2 benches to 30m AOD and extend the life of the current permission for the smaller Ton Mawr quarry to end of 2042 but these are both within the current quarry extraction area. Therefore, there should be no habitat loss or associated impacts from Cardiff Beech Woods SAC due to proposals in the Local Plan. Therefore, no likely significant effects will result. Therefore this policy has no likely significant effects.
MW2: Preferred Order of Mineral Resource Release	The extension or deepening of existing mineral workings will be favoured in preference to the release of new sites and, with the exception of the lateral extension to Ton Mawr Quarry referred to in Policy M1, deepening will be preferred to lateral extension. Applications to extend or deepen mineral workings will be permitted where it can be demonstrated that: **i.** There are environmental improvements at the site which can be justified by the addition of new reserves, or traded off by the giving up of existing reserves, or; **ii.** The addition of new reserves preserves the productive capacity of Cardiff to meet its sub regional apportionment commitments; or **iii.** There are operational benefits in permitting further reserves that will lead to more efficient exploitation of the resource; **iv.** It should also be demonstrated that such an approach will not cause unacceptable harm to the environment, including consideration of impacts relating to access, noise, air quality, landscape and visual effects, ecology, soil resources, hydrology and hydrogeology, blast vibration and cultural heritage.	No Likely Significant Effects This is a policy which sets a preferred order for how mineral resource extraction is to be increased. This policy favours deepening existing quarries before expanding them and expanding the before establishing new quarries. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
MW3: Quarry Closures and Extension Limits	Measures to prevent further mineral working and, where appropriate, to secure restoration and landscaping works at the earliest opportunity, will be sought at the following sites: **i.** Cefn Garw Quarry, Tongwynlais; **ii.** Highland Park Brickworks, Ely; and **iii.** West End Brickworks, Ely	No Likely Significant Effects This is a policy which seeks to cease the mineral resource extraction at 3 existing quarries. These sites are to be restored and landscaped. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
MW4: Minerals Buffer Zones	Within the minerals buffer zones no mineral working, housing or other sensitive development will be permitted.	No Likely Significant Effects This policy prevents development within the mineral buffer zones. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
MW5: Restoration and After-Use of Mineral Workings	Proposals for mineral working or for related plant and buildings will be permitted only where firm proposals are included for the reinstatement of the site to a condition fit for an	No Likely Significant Effects

Policy	Description	Likely Significant Effects
	appropriate after-use supported, where relevant, by adequate after-care proposals. Appropriate reinstatement and after-care proposals will similarly be required when existing controls are reviewed. In drawing up restoration proposals, mineral operators will be encouraged to: **i.** Undertake progressive restoration; **ii.** Make beneficial use of mineral waste generated by mineral operations; **iii.** Consider whether restoration can contribute to nature conservation objectives set out in the Natural Recovery Action Plan/Biodiversity and Resilience of Ecosystems Duty actions; **iv.** New uses of former mineral workings other than those appropriate to a rural area will not be permitted without special justification. Proposals to carry out safety works at derelict or dormant sites will be favoured.	This policy requires mineral working developments to include proposals for the restoration of the site to a suitable condition after use. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
MW6: Sand Warf Protection Areas	The sand wharves shown on the Proposals Map will be protected against development which would prejudice their ability to land marine dredged sand and gravel. Proposals for the provision and improvement of landing and distribution facilities for marine dredged aggregates within the sand wharves shown on the Proposals Map will be favoured where there will be no unacceptable harm to the environment.	No Likely Significant Effects This policy protects existing Sand Wharves from development that would limit their functionality and supports improvements that don't harm the environment. This policy does not allocate any new sites or quantum of development and safeguarding an area does not imply it will be used. This policy therefore has no likely significant effects.
MW7: Safeguarding of Sand and Gravel and Limestone Resources	Development will not be permitted within the Sand and Gravel, Limestone and sandstone HSA Safeguarding Areas shown on the Proposals Map that would permanently sterilise these mineral resources unless: **i.** The applicant can demonstrate to the satisfaction of the Local Planning Authority that the mineral concerned is no longer of any resource value or potential resource value; or **ii.** The mineral can be extracted satisfactorily prior to the incompatible development taking place; or **iii.** The incompatible development is of a temporary nature and can be completed and the site restored to a condition that does not either sterilise the resource or inhibit extraction within the timescale that the mineral is likely to be needed; or **iv.** There is an overriding need for the incompatible development which overrides the need for the resource, including a requirement for prior extraction if practicable.	No Likely Significant Effects This policy prevents development within the Sand and Gravel, Limestone and Sandstone HAS Safeguarding Areas unless certain criteria are met. This policy does not allocate any sites or quantum of development and safeguarding an area does not imply it will be used. Therefore, this policy has no likely significant effects.
MW8: Sites for Waste Management Facilities	Proposals for the development of waste management facilities will be permitted where: **i.** There is a demonstrable need assessed against regional requirements; or **ii.** The proposed facility would move the management of waste up the waste hierarchy; and	No Likely Significant Effects This is a policy requiring that the development of waste management facilities is appropriate to local requirements, does not cause unacceptable harm and is also requires supports enhancements to the Cardiff Rail Network. This should assist in

Policy	Description	Likely Significant Effects
	iii. There would be no unacceptable harm to the environment, human health, landscape and built heritage; **iv.** It would not cause unacceptable air, noise, light or water pollution or unacceptable levels of dust, vibration or odours; **v.** It would not be located within an area at risk of flooding; **vi.** It would not endanger aviation safety; **vii.** The proposal includes acceptable plans for restoration, aftercare and after-use; **viii.** The proposal includes acceptable proposals for the protection of adjoining and nearby land from gas and leachate migration, or contamination; **ix.** There would be safe means of access to the highway and adequate on-site parking and turning facilities; **x.** The proposal is accompanied by a Waste Planning Assessment containing sufficient information to enable an assessment of the proposal. Facilities for the handling, treatment and transfer of waste will generally be encouraged towards existing use class B2 general industrial land.	reducing the number of vehicles and thus reduce the impact of atmospheric pollution. This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.
MW9: Provision for Waste Management Facilities in Development	Where appropriate, provision will be sought in all new development for facilities for the storage, recycling and other management of waste.	No Likely Significant Effects This policy does not allocate any sites or quantum of development and therefore has no likely significant effects.

Table 5. Policy Screening Table

Site Ref.	Site Name	Site Size	Dwellings	Other	HRA Implications
SH1.1	Land at Church Farm (part of adopted LDP Strategic Site F)	14.16	205		Likely significant effects 5.8km from Severn Estuary SAC, SPA and Ramsar 4.3km from Cardiff Beech Woods SAC The following impact pathways are present: • Recreational pressure • Atmospheric pollution • Water quality • Water quantity, level and flow
SH1.2	Land south of the M4 Motorway, West of Rudry Road, Lisvane (Part of adopted LDP Strategic Site F)	4.96	100		Likely Significant Effects 6.6km from Severn Estuary SAC, SPA and Ramsar 3.6km from Cardiff Beech Woods SAC The following impact pathways are present: • Recreational pressure • Atmospheric pollution • Water quality Water quantity, level and flow
SH1.3	Land to the north of Ty-Draw Road (Part of adopted LDP Strategic Site F)	15.33	350		Likely significant effects 5.1km from Severn Estuary SAC, SPA and Ramsar 5.2km from Cardiff Beech Woods SAC The following impact pathways are present: • Recreational pressure • Atmospheric pollution • Water quality • Water quantity, level and flow
SH1.4	Land south of Llantrisant Road (Part of adopted LDP Strategic Site D)	13	300		Likely significant effects 12.9km from Severn Estuary SAC, SPA and Ramsar 3.1km from Cardiff Beech Woods SAC The following impact pathways are present: • Recreational pressure • Atmospheric pollution • Water quality • Water quantity, level and flow

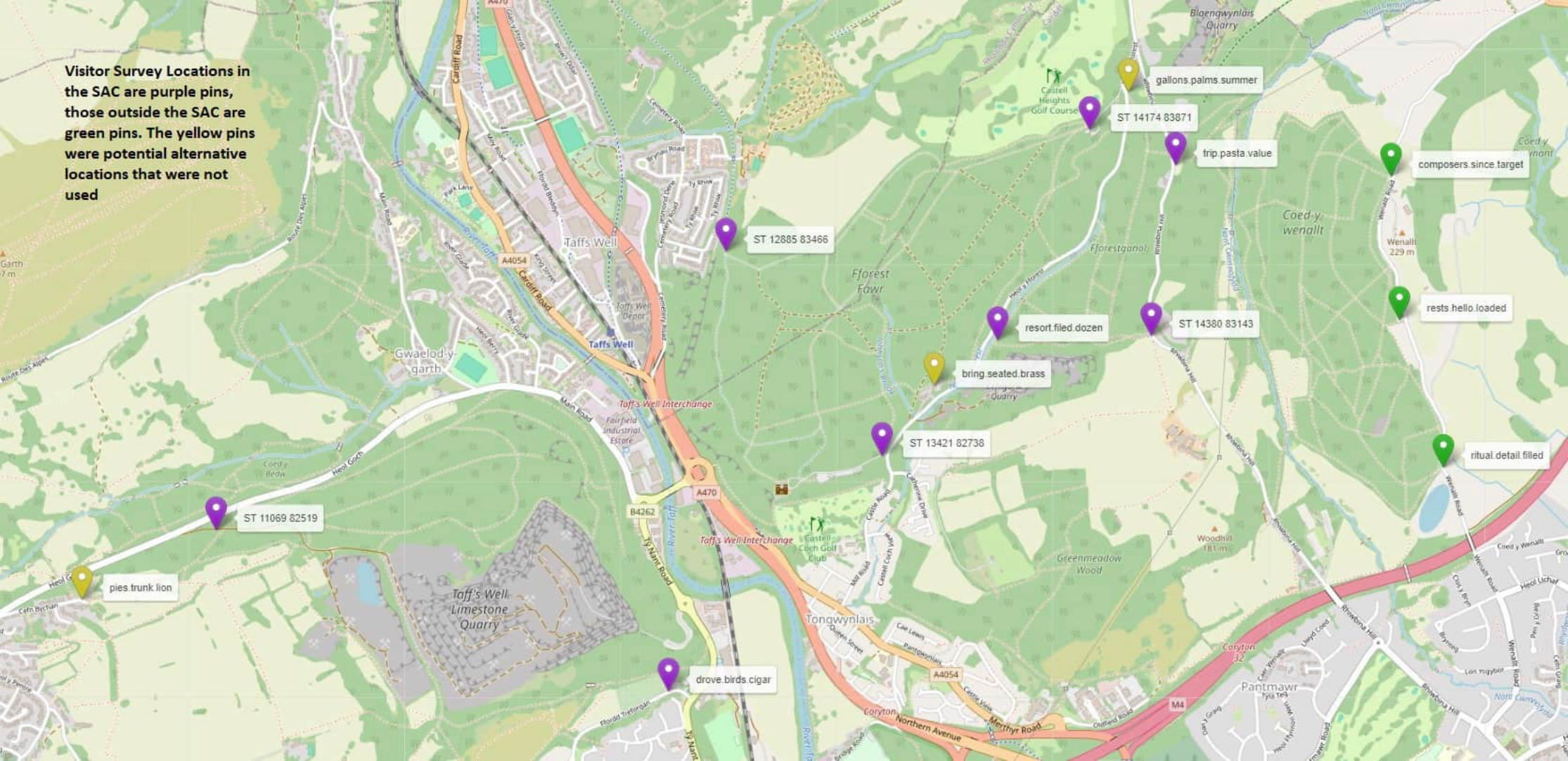
Site Ref.	Site Name	Site Size	Dwellings	Other	HRA Implications
SH1.5	Land at Llantrisant Road (A4119) (Part of adopted LDP Strategic Site D)	8.73	150		Likely significant effects 11.6km from Severn Estuary SAC, SPA and Ramsar 2.6km from Cardiff Beech Woods SAC The following impact pathways are present: • Recreational pressure • Atmospheric pollution • Water quality • Water quantity, level and flow
SH1.6	Land at Llwynioli Farm (Part of adopted LDP Strategic Site D)	3.4	70		Likely significant effects 13km from Severn Estuary SAC, SPA and Ramsar 3.2km from Cardiff Beech Woods SAC The following impact pathways are present: • Recreational pressure • Atmospheric pollution • Water quality • Water quantity, level and flow
SH1.7	Former Gas Works, Ferry Road	3.98	500		Likely significant effects 2.3km from Severn Estuary SAC, SPA and Ramsar 9.1km from Cardiff Beech Woods SAC The following impact pathways are present: • Recreational pressure • Loss of functionally linked land • Atmospheric pollution • Water quality • Water quantity, level and flow
H1.1	Land at areas 9-12, St Mellons	4	150		Likely significant effects 1.6km from Severn Estuary SAC, SPA and Ramsar The following impact pathways are present: • Recreational pressure • Loss of functionally linked land • Atmospheric pollution • Water quality • Water quantity, level and flow

Site Ref.	Site Name	Site Size	Dwellings	Other	HRA Implications
H1.2	Rookwood Hospital Canton	3.4	90		Likely significant effects 6.2km from Severn Estuary SAC, SPA and Ramsar 4.4km from Cardiff Beech Woods SAC The following impact pathways are present: • Recreational pressure • Atmospheric pollution • Water quality • Water quantity, level and flow
H2.1	International Sports Village	5.88	1000		Likely significant effects 0.9km from Severn Estuary SAC, SPA and Ramsar The following impact pathways are present: • Recreational pressure • Loss of functionally linked land • Atmospheric pollution • Water quality • Water quantity, level and flow
H2.2	Whitchurch Hospital/Velindre Site	26	410		Likely significant effects 7.7km from Severn Estuary SAC, SPA and Ramsar 1.9km from Cardiff Beech Woods SAC The following impact pathways are present: • Recreational pressure • Loss of functionally linked land • Atmospheric pollution • Water quality • Water quantity, level and flow
H2.3	Cardiff Gate Business Park (West)	6.4	200		Likely significant effects 5.2km from Severn Estuary SAC, SPA and Ramsar 6km from Cardiff Beech Woods SAC The following impact pathways are present: • Recreational pressure • Loss of functionally linked land • Atmospheric pollution • Water quality • Water quantity, level and flow

Site Ref.	Site Name	Site Size	Dwellings	Other	HRA Implications
H2.4	Roath Dock (North Side)	3.67	316	Port, port-related uses and mixed-use development	Likely significant effects 0.9km from Severn Estuary SAC, SPA and Ramsar 9.9km from Cardiff Beech Woods SAC The following impact pathways are present: • Recreational pressure • Loss of functionally linked land • Atmospheric pollution • Water quality • Water quantity, level and flow
H2.5	Porth Teigr and Alexandra Head	27		Retail & Food & Drink, Business, Hotel, Residential, Assembly and Leisure, Car Parking and transport infrastructure.	Likely significant effects 0.1km from Severn Estuary SAC, SPA and Ramsar 10km from Cardiff Beech Woods SAC The following impact pathways are present: • Recreational pressure • Loss of functionally linked land • Atmospheric pollution • Water quality • Water quantity, level and flow
H2.6	Hadfield Road	4.8	200		Likely significant effects 3km from Severn Estuary SAC, SPA and Ramsar 8.1km from Cardiff Beech Woods SAC The following impact pathways are present: • Recreational pressure • Loss of functionally linked land • Atmospheric pollution • Water quality • Water quantity, level and flow
H2.7	Callaghan Square	3.36	315		Likely significant effects 2.3km from Severn Estuary SAC, SPA and Ramsar 8.4km from Cardiff Beech Woods SAC The following impact pathways are present: • Recreational pressure • Loss of functionally linked land • Atmospheric pollution • Water quality

Site Ref.	Site Name	Site Size	Dwellings	Other	HRA Implications
					• Water quantity, level and flow

Appendix C Cardiff Beech Woods SAC Recreational Survey Results


Visitor Survey Locations in the SAC are purple pins, those outside the SAC are green pins. The yellow pins were potential alternative locations that were not used
gallons.palms.summer
ST 14174 83871
trip.pasta.value
composers.since.target
ST 12885 83466
rests.hello.loaded
resort.filed.dozen
ST 14380 83143
bring.seated.brass
ST 13421 82738
ritual.detail.filled
ST 11069 82519
pies.trunk.lion
drove.birds.cigar
Taffs Well
Cardiff Road
A4054
A470
B4262
Taff's Well Interchange
Taff's Well Limestone Quarry
Fforest Fawr
Coed-y-wenallt
Tongwynlais
Castell Heights Golf Course
Castell Coch Golf Club
Greenmeadow Wood
Pantmawr
Coryton
Northern Avenue
M4
Gwaelod-y-garth
Fairfield Industrial Estate
Blaengwynlais Quarry

Cardiff Beech Woods SAC Survey Marked-Up Questionnaire

Total base: 143 completed surveys

These results show the survey responses from the face-to-face interviews. The number of responses is shown along with the percentage results for information. Caution should be taken when interpreting results where small sample sizes are involved as the results are not statistically robust at this level.

Date of interview:

Monday	**6 (4%)**
Tuesday	**10 (7%)**
Wednesday	**7 (5%)**
Thursday	**13 (9%)**
Friday	**10 (7%)**
Saturday	**64 (45%)**
Sunday	**33 (23%)**

Interviewing location:

Location 1: Heol Goch, east of Pen-y-garn	**12 (8%)**
Location 2: Ffordd Treforgan	**5 (3%)**
Location 3: Access to Taff Trail, south of Ty Rhiw	**11 (8%)**
Location 4: Off Castle Road, north of Tongwynlais	**15 (10%)**
Location 5: North of Cefngarw Quarry	**6 (4%)**
Location 6: Fforest Fawr car park	**25 (17%)**
Location 7: Foot access location west of Rhiwbina Hill	**15 (10%)**
Location 8: Rhiwbina Hill, north of Pantmawr	**6 (4%)**
Location 9: The Druid Camp	**0 (0%)**
Location 10: Wenallt Forest Car Park	**33 (23%)**
Location 11: Foot access location off Wenallt Road	**15 (10%)**

Weather at time of interview:

Raining	19 (13%)
Cloudy	92 (64%)
Windy	21 (15%)
Sunny	30 (21%)
Dry	69 (48%)

Q1 We would like to know a little bit more about the nature of your visit here today. Are you...

On a day trip / short visit having travelled directly from home?	138 (97%)
On a day trip / short visit having stayed away from home with friends or family?	4 (3%)
Staying away from home, e.g. on holiday?	1 (1%)
Other	0 (0%)

Q2 What is the main activity you are undertaking today? *Do not prompt*

Dog walking	88 (62%)
Walking	33 (23%)
Exercising	9 (6%)
Cycling	9 (6%)
Motorbiking	0 (0%)
Climbing	0 (0%)
Family outing	3 (2%)
Wildlife watching	0 (0%)
Enjoying the scenery	0 (0%)
None of the above	1 (1%)

Q3 How long have you / will you spend in the area today?

Less than 30 minutes	4 (3%)
Between 30 minutes and 1 hour	54 (38%)
1-2 hours	60 (42%)
2-3 hours	16 (11%)
3-4 hours	6 (4%)
4 hours and more	3 (2%)

Q4 In the past, how often have you visited this site? *Give respondents a rough idea of the categories if they struggle*

Daily	23 (16%)
Most days (180+ visits)	18 (13%)
1 to 3 times a week (40-180 visits)	43 (30%)
2 to 3 times per month (15-40 visits)	18 (13%)
Once a month (6-15 visits)	11 (8%)
Less than once a month (2-5 visits)	18 (13%)
Unsure	0 (0%)
First visit	12 (8%)

Q5 Do you tend to visit the area at a specific time of the year for ? *Do not prompt - tick all that apply*

Spring (March to May)	5 (3%)
Summer (June to August)	6 (4%)
Autumn (September to November)	8 (6%)
Winter (December to February)	1 (1%)
Equally all year	114 (80%)
Unsure	9 (6%)
First visit	11 (8%)

Q6 How did you travel to the site today?

Car / van	96 (67%)
On foot	34 (24%)
Bicycle	10 (7%)
Public Transport	3 (2%)
Other	0 (0%)

Q7 **We would like to get a better understanding of your route on site today. Looking at the area printed on the map, please indicate:**

Where you started today?
The route you have taken today?
Where your finish point was?

INTERVIEWERS:

Please draw the route on the seperate paper map provided and

Please use the following codes on this map:

P for parking or E for entry (if visitor entered on foot)
S for the start point
F for the finish point

Interviewer note: Record map reference number here so that we can link the paper map to this survey.

Map reference number	**143 (100%)**

Q8 **Thinking about your route, is this the normal route length when you visit the area for ?**

Yes, normal	**101 (71%)**
Longer than normal	**5 (3%)**
Shorter than normal	**17 (12%)**
Unsure	**8 (6%)**
First visit	**12 (8%)**

Q9 **What, if anything, influenced your route here today?** ***Do not prompt - tick all that apply***

Weather	**27 (19%)**
Time available	**31 (22%)**
Other users (e.g. avoiding crowds)	**2 (1%)**
Group members (e.g. children, dogs)	**14 (10%)**
Trail condition (e.g. muddy areas)	**9 (6%)**
Previous knowledge of the area	**75 (52%)**
Particular viewpoint / feature	**10 (7%)**
Birdwatching (e.g. waders / waterfowl)	**0 (0%)**
Following a marked trail (i.e. the Wales Coast Path)	**8 (6%)**
Other	**30 (21%)**

Q10 Why do you choose to visit the Cardiff Beech Woods SAC rather than another local site? *Do not prompt - tick all that apply*

Don't know	0 (0%)
Proximity to home	67 (47%)
Able to travel to site on foot	18 (13%)
Quick travel route	25 (17%)
Good / easy parking	28 (20%)
Particular facilities (e.g. café / pubs / toilets)	2 (1%)
Different routes availableParticular facilities (e.g. café / pubs / toilets)	4 (3%)
Quiet / no traffic	15 (10%)
Few people	15 (10%)
Natural scenery	54 (38%)
Wild landscape	19 (13%)
Wildlife interest	8 (6%)
Water feature	1 (1%)
Coast / estuary	0 (0%)
Habit / familiarity	20 (14%)
Good for dog / dog enjoys it	29 (20%)
Ability to let dog roam off lead	34 (24%)
Nearest natural place to take the dog	21 (15%)
Nearest safe place to let dog off lead	18 (13%)
Other	27 (19%)

Q11 What is the main reason for visiting the Cardiff Beech Woods rather than another local site?

Don't know	0 (0%)
Proximity to home	32 (36%)
Able to travel to site on foot	1 (1%)
Quick travel route	0 (0%)
Good / easy parking	6 (7%)
Particular facilities (e.g. café / pubs / toilets)	0 (0%)
Different routes availableParticular facilities (e.g. café / pubs / toilets)	0 (0%)
Quiet / no traffic	2 (2%)
Few people	3 (3%)
Natural scenery	13 (15%)
Wild landscape	6 (7%)
Wildlife interest	0 (0%)
Water feature	0 (0%)
Coast / estuary	0 (0%)
Habit / familiarity	5 (6%)
Good for dog / dog enjoys it	8 (9%)
Ability to let dog roam off lead	8 (9%)
Nearest natural place to take the dog	1 (1%)
Nearest safe place to let dog off lead	1 (1%)
Other	3 (3%)

Q12 Which other location would you have visited for if you hadn't come to the Cardiff Beech Woods today? *Please record accurately and prompt for a specific place name; avoid answers such as 'local park'*

143 (100%)

Q13 In what ways could your alternative destinations be improved to encourage you to spend a higher proportion of your weekly outings there? *Please record accurately*

143 (100%)

Q14 **What proportion of your weekly outings for take place in the Cardiff Beech Woods compared to other sites (e.g. a local park)? Are you able to give a rough percentage?** ***Don't prompt but give a rough indication of categories if respondent struggles***

All takes place here	**10 (7%)**
75% or more	**39 (27%)**
50-74%	**16 (11%)**
25-49%	**19 (13%)**
Less than 25%	**50 (35%)**
Not sure / first visit	**9 (6%)**

Q15 **Have you noticed a change in visitor numbers in the time that you have been visiting the Cardiff Beech Woods?** ***Do not prompt***

More people	**51 (36%)**
Fewer people	**9 (6%)**
Remained the same	**64 (45%)**
Unsure / first visit	**19 (13%)**

Q16 **Are you aware of any conservation designations that apply to these woodlands?**

Yes	**38 (27%)**
No	**100 (70%)**
Unsure	**5 (3%)**

Q17 **If yes, can you name the designation?** ***Do not prompt - tick all that apply***

Interviewer note: Special Areas of Conservation (SAC), Special Protection Areas (SPAs), Local Nature Reserve, Sites of Special Scientific Interest (SSSI)

SSSI	**12 (32%)**
SAC	**5 (13%)**
European site	**0 (0%)**
No / unsure	**16 (42%)**
Other	**9 (24%)**

Q18 **Are you aware that the woodlands are designated for habitats that are sensitive to human disturbance, such as through trampling damage or nutrient enrichment from dog faeces?** ***Do not prompt***

Yes	**62 (43%)**
No	**75 (52%)**
Unsure / don't know	**6 (4%)**
Other	**0 (0%)**

Q19 **Have you noticed any measures relating to the conservation of trees, ground flora or the wider woodland ecosystem?**
Do not prompt but give respondents an example of measures if they struggle

Information boards	**51 (36%)**
Signage (e.g. dog-on-lead signs)	**14 (10%)**
Ranger presence	**6 (4%)**
Measures to protect individual trees	**46 (32%)**
Other	**59 (41%)**

Q20a **Do you visit other parts of the Cardiff Beech Woods?**

Yes	**60 (42%)**
No	**83 (58%)**

Q20b **If yes: Please ask them to point out and note down the approximate location(s) on a map of suitable scale -**

(Note the route should be drawn by the surveyor on the separate paper maps) – Please use an X to highlight other parts of these woodlands which may include Garth Wood, Castell Coch and the Wenallt)

Interviewer note: Record map reference number here so that we can link the paper map to this survey.

60 (100%)

Q21 **Are there any changes / improvements you would like to see in how the woodland is managed for access?** ***Note down as succinctly as possible***

143 (100%)

Q22 **Please, would you be able to provide your full home postcode?** ***If respondent appears reluctant, please reiterate the importance of this piece of information and reassure that there are many residential dwellings to a postcode - no information will be sent to them.***

131 (100%)

Q23 **Only ask this question if the visitor is unable or refuses to give postcode:**

Would you be able to give us the name of the city / town / village you live in? ***If respondent is on holiday record their place of stay here***

12 (100%)

Q25 ***Record by observation - DO NOT READ OUT***

WRITE IN BELOW THE NUMBER OF ADULTS, CHILDREN, DOGS AND/OR DOGS OFF LEADS VISITING TODAY.
IF NONE PLEASE WRITE IN '00'

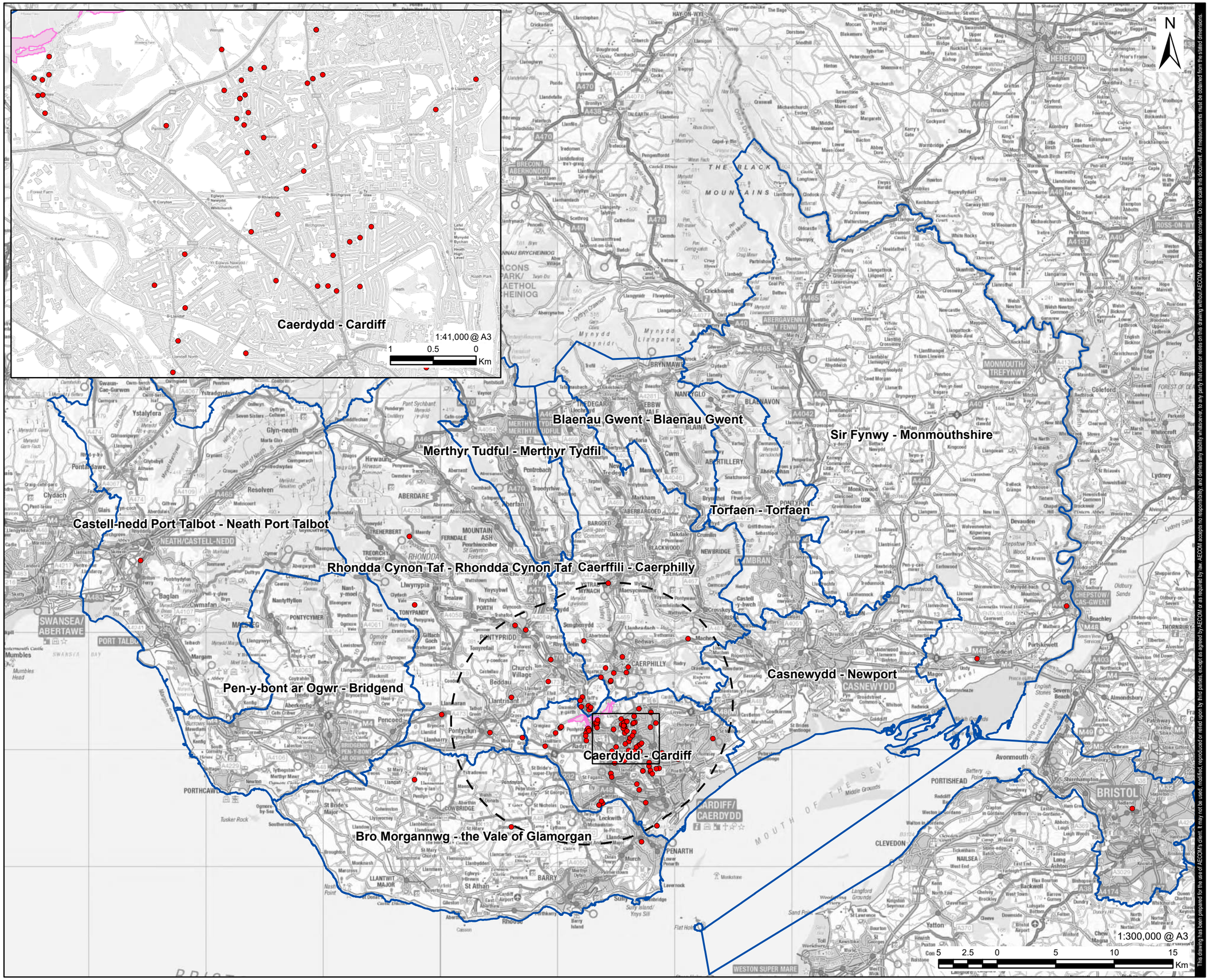
Number of people including respondent in group?	**143 (100%)**
Number of dogs in group?	**143 (100%)**
Number of dogs off the lead?	**143 (100%)**

Q26 **Gender** ***Record by observation***

Male	**74 (52%)**
Female	**69 (48%)**

Revision: 0 Drawn: JA Checked: XX Approved: XX Date: 2024-10-24

Filename: C:\Users\Airlie.J\OneDrive - AECOM\Documents\Projects\60703750 - Cardiff Beech Woods\02_Maps\Cardiff_Beech_Woods_SAC_Survey_21102024.aprx



AECOM

PROJECT

Cardiff Beech Woods SAC Survey

CLIENT

Client Name / Logo Here

CONSULTANT

AECOM Limited
4th Floor, One Temple Quay
Temple Back East,
Bristol, BS1 6DZ
www.aecom.com

LEGEND

- Survey Postcode (Points)
- District Boundary
- Cardiff Beech Woods (SAC)
- 10km Study Area - Cardiff Beech Woods

NOTES

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60703750

FIGURE TITLE

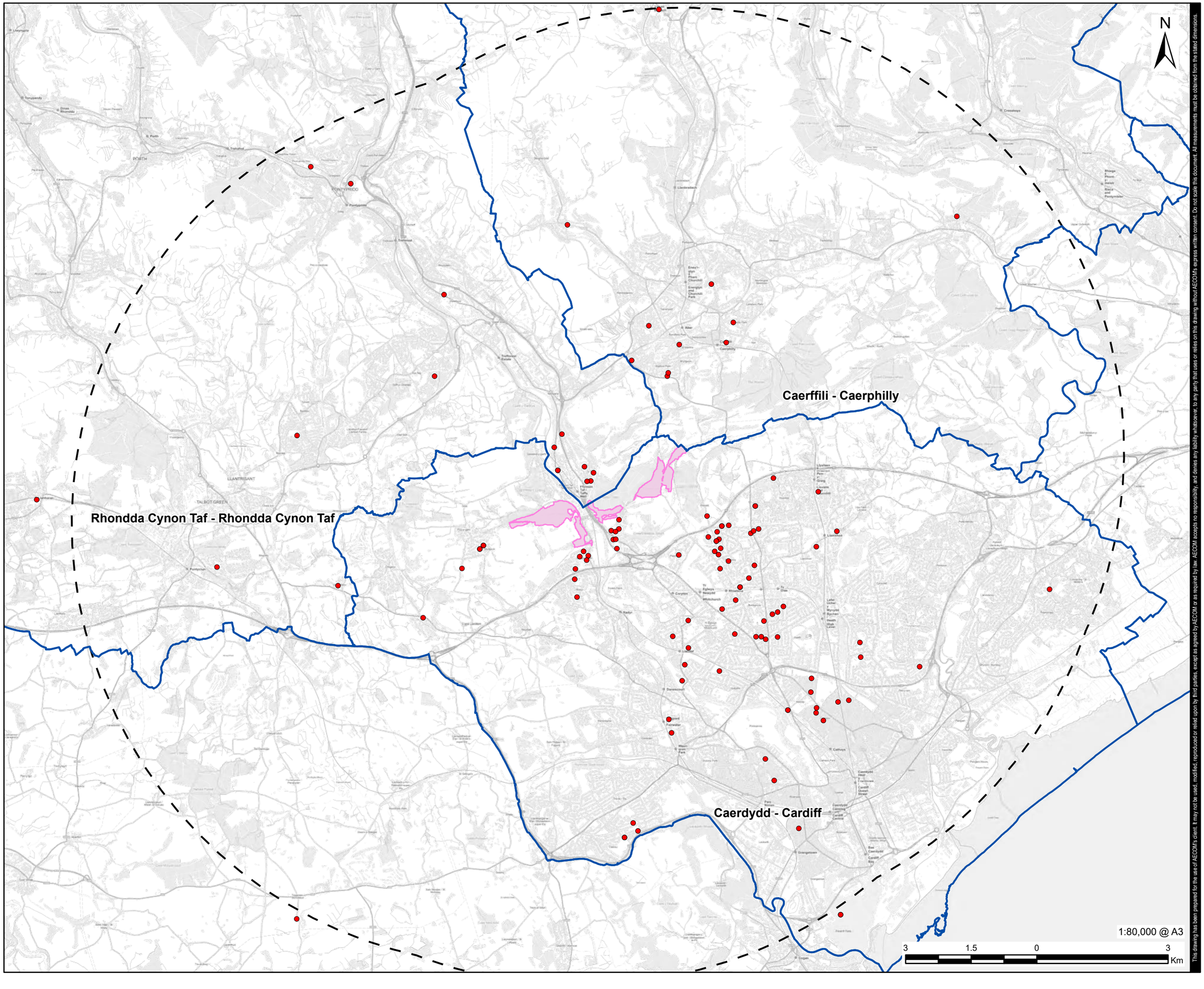
Cardiff Beech Wood Survey Postcodes

FIGURE NUMBER

Figure 1

Revision: 0 Drawn: JA Checked: XX Approved: XX Date: 2024-10-24

Filename: C:\Users\AVirlie\OneDrive - AECOM\Documents\Projects\60703750 - Cardiff Beech Woods\02_Maps\Cardiff_Beech_Woods_SAC_Survey_21102024.aprx



AECOM

PROJECT

Cardiff Beech Woods SAC Survey

CLIENT

Client Name / Logo Here

CONSULTANT

AECOM Limited
4th Floor, One Temple Quay
Temple Back East,
Bristol, BS1 6DZ
www.aecom.com

LEGEND

- Survey Postcode (Points)
- District Boundary
- Cardiff Beech Woods (SAC)
- 10km Study Area - Cardiff Beech Woods

NOTES

ISSUE PURPOSE

FINAL

PROJECT NUMBER

60703750

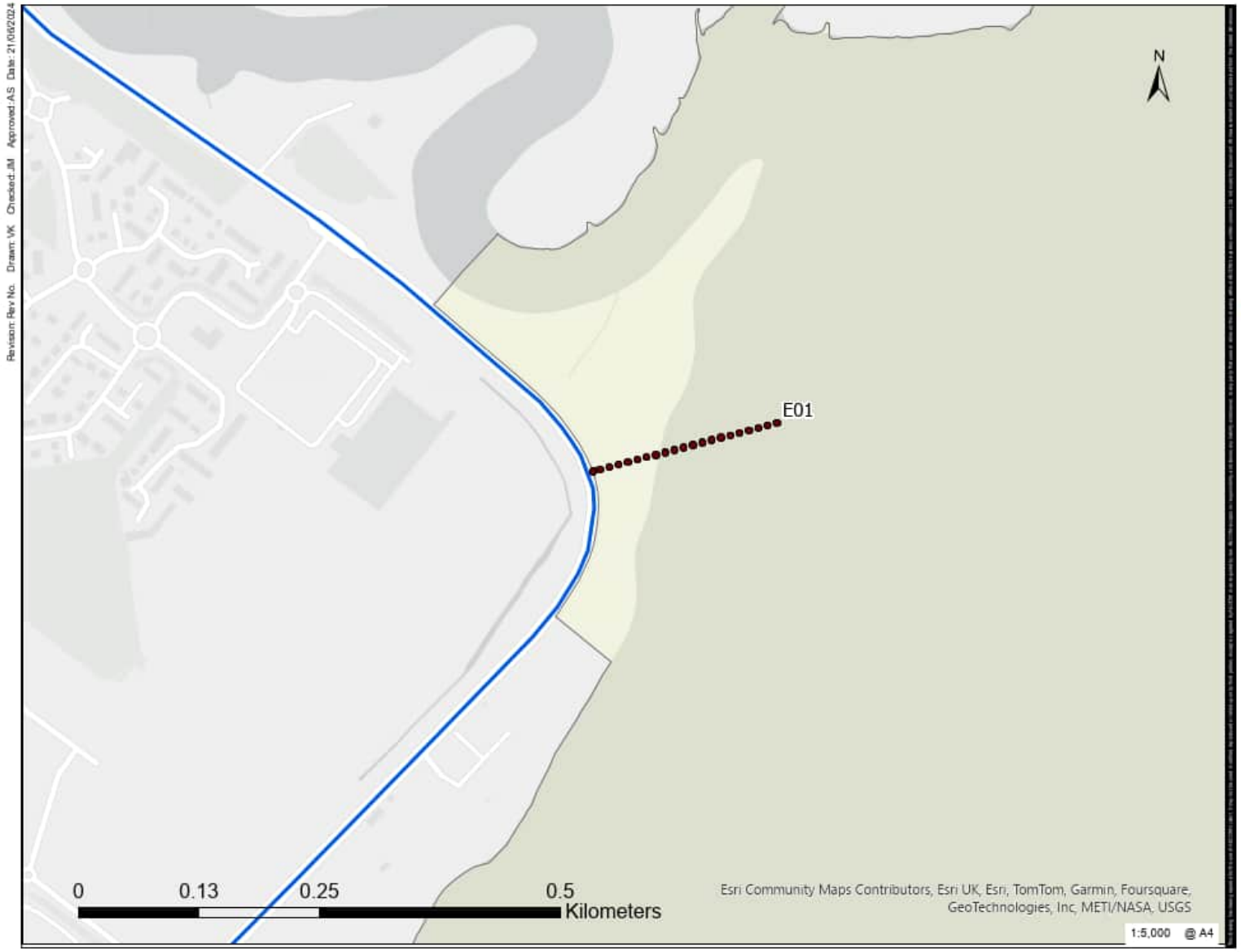
FIGURE TITLE

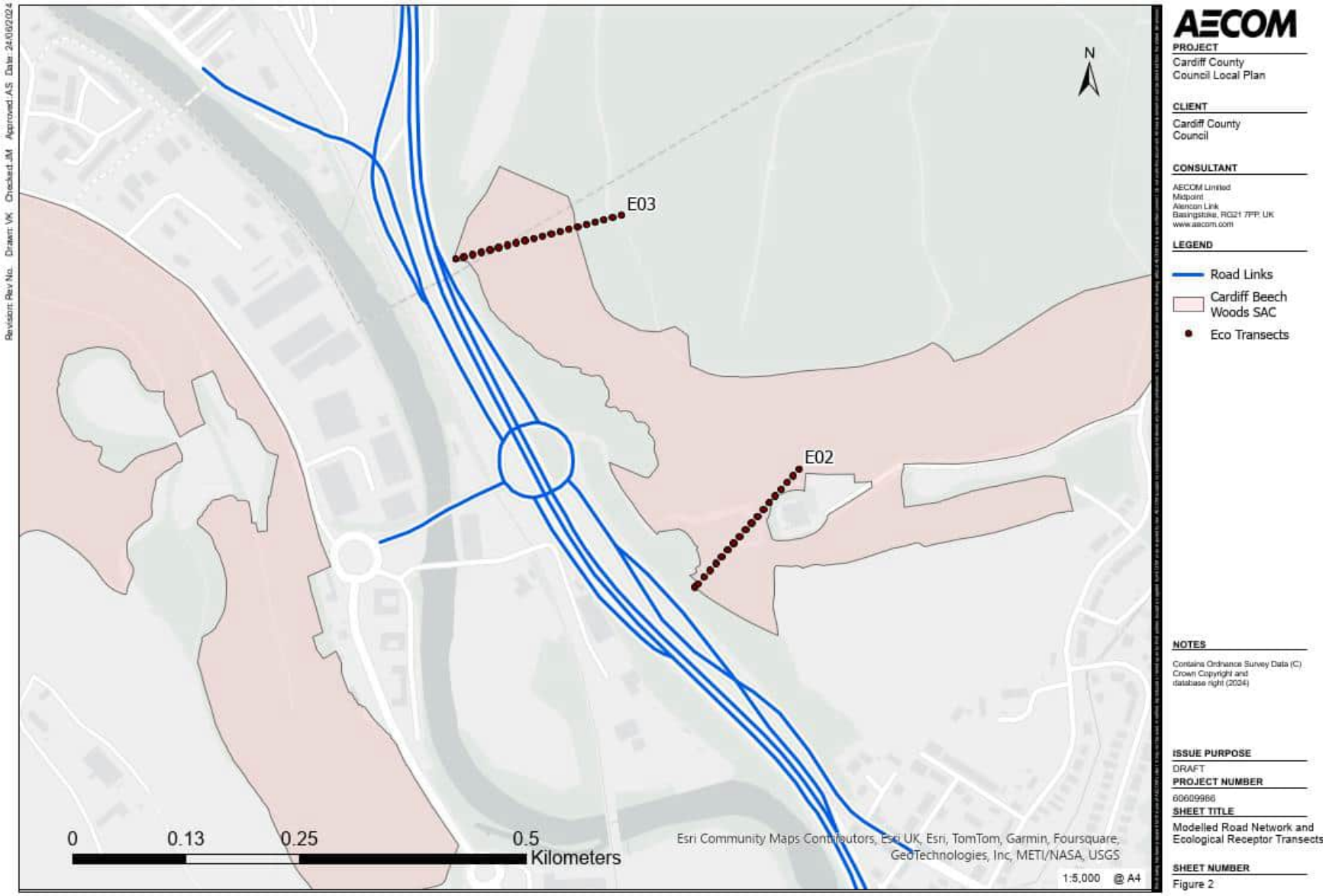
Cardiff Beech Wood Survey Postcodes

FIGURE NUMBER

Figure 2

Appendix D Air Quality Modelling Results


Revision: Rev No. Drawn: VK Checked: JM Approved: AS Date: 21/06/2024
N
E01
0
0.13
0.25
0.5
Kilometers
Esri Community Maps Contributors, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
1:5,000 @ A4
AECOM
PROJECT
Cardiff County Council Local Plan
CLIENT
Cardiff County Council
CONSULTANT
AECOM Limited
Midpoint
Alencon Link
Basingstoke, RG21 7PP, UK
www.aecom.com
LEGEND
Eco Transects
Road Links
Severn Estuary SAC
NOTES
Contains Ordnance Survey Data (C) Crown Copyright and database right (2024)
ISSUE PURPOSE
DRAFT
PROJECT NUMBER
60609986
SHEET TITLE
Modelled Road Network and Ecological Receptor Transects
SHEET NUMBER
Figure 1


Revision: Rev No. Drawn: VK Checked: JM Approved: AS Date: 24/06/2024
N
E03
E02
0
0.13
0.25
0.5
Kilometers
Esri Community Maps Contributors, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS
1:5,000 @ A4
AECOM
PROJECT
Cardiff County Council Local Plan
CLIENT
Cardiff County Council
CONSULTANT
AECOM Limited
Midpoint
Alencon Link
Basingstoke, RG21 7PP, UK
www.aecom.com
LEGEND
Road Links
Cardiff Beech Woods SAC
Eco Transects
NOTES
Contains Ordnance Survey Data (C) Crown Copyright and database right (2024)
ISSUE PURPOSE
DRAFT
PROJECT NUMBER
60609986
SHEET TITLE
Modelled Road Network and Ecological Receptor Transects
SHEET NUMBER
Figure 2

Transect / Receptor	Total Annual Mean NOx (µg/m3)				Total Annual Mean NH3 (µg/m3)				Total Annual Mean N Dep (kgN/ha/yr)			
	2024	2036	2036	2036	2024	2036	2036	2036	2024	2036	2036	2036
	Base	FB	DM	DS	Base	FB	DM	DS	Base	FB	DM	DS
E01_2.5m	30.59	15.00	15.27	15.48	2.72	2.35	2.41	2.47	28.86	25.02	25.40	25.68
E01_10m	23.20	13.75	13.91	14.02	2.21	2.01	2.05	2.08	25.67	23.18	23.39	23.54
E01_20m	19.69	13.16	13.26	13.33	1.98	1.86	1.88	1.90	24.19	22.34	22.46	22.56
E01_30m	18.06	12.89	12.96	13.01	1.87	1.79	1.80	1.82	23.52	21.95	22.04	22.11
E01_40m	17.13	12.73	12.78	12.83	1.82	1.75	1.76	1.77	23.14	21.74	21.81	21.86
E01_50m	16.52	12.62	12.67	12.71	1.78	1.72	1.73	1.74	22.90	21.60	21.66	21.70
E01_60m	16.09	12.55	12.59	12.62	1.75	1.71	1.71	1.72	22.73	21.51	21.55	21.59
E01_70m	15.77	12.50	12.53	12.56	1.73	1.69	1.70	1.71	22.60	21.43	21.48	21.51
E01_80m	15.52	12.46	12.49	12.51	1.72	1.68	1.69	1.69	22.51	21.38	21.42	21.44
E01_90m	15.33	12.42	12.45	12.47	1.71	1.68	1.68	1.69	22.43	21.34	21.37	21.39
E01_100m	15.17	12.40	12.42	12.44	1.70	1.67	1.67	1.68	22.37	21.31	21.33	21.35
E01_110m	15.04	12.38	12.40	12.41	1.69	1.66	1.67	1.67	22.32	21.28	21.30	21.32
E01_120m	14.93	12.36	12.38	12.39	1.68	1.66	1.66	1.67	22.28	21.26	21.28	21.29
E01_130m	14.84	12.34	12.36	12.37	1.68	1.66	1.66	1.66	22.25	21.24	21.26	21.27
E01_140m	14.76	12.33	12.34	12.36	1.67	1.65	1.66	1.66	22.22	21.22	21.24	21.25
E01_150m	14.69	12.32	12.33	12.34	1.67	1.65	1.65	1.66	22.19	21.20	21.22	21.24
E01_160m	14.63	12.31	12.32	12.33	1.66	1.65	1.65	1.65	22.17	21.19	21.21	21.22
E01_170m	14.58	12.30	12.31	12.32	1.66	1.65	1.65	1.65	22.15	21.18	21.20	21.21
E01_180m	14.53	12.29	12.30	12.31	1.66	1.65	1.65	1.65	22.13	21.17	21.19	21.20
E01_190m	14.49	12.28	12.29	12.30	1.66	1.64	1.65	1.65	22.11	21.16	21.17	21.19
E01_200m	14.45	12.28	12.29	12.30	1.65	1.64	1.64	1.65	22.10	21.15	21.17	21.18
E02_25m	20.28	10.87	11.00	11.14	1.67	1.55	1.58	1.61	26.71	23.92	24.14	24.37
E02_30m	19.44	10.74	10.86	10.98	1.63	1.53	1.55	1.57	26.25	23.68	23.87	24.07
E02_40m	18.19	10.55	10.64	10.74	1.57	1.49	1.50	1.52	25.57	23.34	23.49	23.64
E02_50m	17.36	10.42	10.50	10.58	1.53	1.46	1.47	1.49	25.13	23.11	23.24	23.36

E02_60m	16.73	10.32	10.40	10.46	1.50	1.44	1.45	1.47	24.81	22.95	23.06	23.16
E02_70m	16.24	10.25	10.31	10.37	1.48	1.43	1.44	1.45	24.55	22.82	22.92	23.00
E02_80m	15.83	10.19	10.24	10.29	1.46	1.42	1.42	1.43	24.35	22.72	22.80	22.88
E02_90m	15.48	10.13	10.18	10.23	1.44	1.41	1.41	1.42	24.18	22.64	22.71	22.77
E02_100m	15.19	10.09	10.13	10.17	1.43	1.40	1.40	1.41	24.04	22.57	22.63	22.69
E02_110m	14.94	10.05	10.09	10.13	1.42	1.39	1.40	1.40	23.92	22.51	22.57	22.62
E02_120m	14.73	10.02	10.05	10.09	1.41	1.38	1.39	1.40	23.81	22.46	22.51	22.56
E02_130m	14.54	9.99	10.02	10.05	1.41	1.38	1.39	1.39	23.72	22.42	22.46	22.50
E02_140m	14.37	9.96	9.99	10.02	1.40	1.38	1.38	1.38	23.65	22.38	22.42	22.46
E02_150m	14.22	9.94	9.97	9.99	1.39	1.37	1.38	1.38	23.58	22.35	22.38	22.42
E02_160m	14.09	9.92	9.95	9.97	1.39	1.37	1.37	1.38	23.52	22.32	22.35	22.38
E02_170m	13.98	9.90	9.93	9.95	1.38	1.37	1.37	1.37	23.46	22.29	22.32	22.35
E02_180m	13.87	9.89	9.91	9.93	1.38	1.36	1.37	1.37	23.41	22.26	22.29	22.32
E02_190m	13.77	9.87	9.89	9.91	1.38	1.36	1.36	1.37	23.36	22.24	22.27	22.29
E02_200m	13.69	9.86	9.88	9.89	1.37	1.36	1.36	1.36	23.32	22.22	22.24	22.27
E03_10.75m	38.10	13.59	14.02	14.33	2.66	2.20	2.29	2.36	37.07	29.39	30.17	30.71
E03_20m	28.98	12.20	12.47	12.68	2.15	1.87	1.92	1.96	31.75	26.57	27.06	27.40
E03_30m	23.33	11.33	11.52	11.65	1.84	1.67	1.70	1.73	28.50	24.86	25.17	25.39
E03_40m	20.63	10.92	11.06	11.16	1.70	1.57	1.60	1.62	26.97	24.06	24.29	24.45
E03_50m	19.02	10.67	10.79	10.87	1.62	1.52	1.54	1.55	26.08	23.60	23.78	23.91
E03_60m	18.02	10.52	10.61	10.69	1.57	1.49	1.50	1.51	25.53	23.32	23.47	23.58
E03_70m	17.31	10.41	10.49	10.56	1.53	1.46	1.48	1.49	25.15	23.13	23.26	23.35
E03_80m	16.75	10.33	10.40	10.46	1.51	1.45	1.46	1.47	24.86	22.98	23.09	23.17
E03_90m	16.30	10.26	10.32	10.37	1.49	1.43	1.44	1.45	24.63	22.87	22.96	23.03
E03_100m	15.89	10.20	10.25	10.30	1.47	1.42	1.43	1.44	24.43	22.77	22.85	22.92
E03_110m	15.53	10.14	10.19	10.23	1.45	1.41	1.42	1.43	24.25	22.68	22.75	22.81
E03_120m	15.21	10.09	10.14	10.17	1.44	1.40	1.41	1.41	24.09	22.60	22.67	22.72
E03_130m	14.91	10.04	10.08	10.12	1.43	1.39	1.40	1.40	23.94	22.52	22.59	22.63
E03_140m	14.62	10.00	10.04	10.06	1.41	1.38	1.39	1.39	23.79	22.45	22.51	22.54

E03_150m	14.36	9.96	9.99	10.02	1.40	1.38	1.38	1.39	23.66	22.39	22.44	22.47
E03_160m	14.15	9.93	9.96	9.98	1.39	1.37	1.38	1.38	23.56	22.34	22.38	22.41
E03_170m	13.98	9.90	9.93	9.95	1.38	1.37	1.37	1.37	23.47	22.29	22.33	22.35
E03_180m	13.84	9.88	9.90	9.92	1.38	1.36	1.37	1.37	23.40	22.26	22.29	22.31
E03_190m	13.72	9.86	9.88	9.90	1.37	1.36	1.36	1.36	23.34	22.23	22.26	22.28
E03_200m	13.62	9.85	9.87	9.88	1.37	1.36	1.36	1.36	23.29	22.21	22.23	22.25

aecom.com