

# Habitats Regulations Assessment of the Spatial Development Strategy

Screening for Likely Significant Effects

Liverpool City Region Combined Authority

November 2023

## Quality information

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# 1. Introduction

- 1.1 Liverpool City Region Combined Authority (LCRCA) is in the process of producing a new Spatial Development Strategy (SDS). AECOM has been appointed to undertake the report to inform the Habitats Regulations Assessment (HRA) of the emerging SDS. A Scoping Report to commence the HRA process was produced and agreed with Natural England in June 2021. This report presents the second stage of the HRA process, the Test of Likely Significant Effects. An Appropriate Assessment (the third and most detailed stage in the process) will accompany the next stage of the SDS in 2024.
- 1.2 As part of its 2015 Devolution Deal, the LCRCA is to create a single statutory city region framework in the form of an SDS prepared in accordance with the relevant legislation and regulations. This SDS will be the first of its kind for the Liverpool City Region. It will set out the Mayoral Combined Authority's strategy for spatial development on a city region wide scale through a range of planning policies concerning development and land use.
- 1.3 The SDS will be a planning document. Its production is led by the Liverpool City Region Metro Mayor and LCRCA working in partnership with Liverpool City Council (LCC), Halton Borough Council (HBC), Knowsley Metropolitan Borough Council (KMBC), St Helens Metropolitan Borough Council (SHMBC), Sefton Metropolitan Borough Council (SMBC) and Wirral Metropolitan Borough Council (WMBC). The SDS will be developed and agreed by all the LCRCA local authorities. When it is published (i.e. adopted), it will form part of the 'Development Plan' for the six City Region local authorities alongside their own Local Plans and Neighbourhood Plans. The Development Plan is the planning policy used in assessing planning applications. It has been determined that the LCRCA SDS should establish a high-level strategic planning strategy for the region to make sure future development provides the right kind of jobs, homes and transport links in the optimum and most sustainable locations, so that everyone in the region can share in the region's success.
- 1.4 In terms of content, legislation requires that regard must be had to the National Planning Policy Framework (NPPF), and to the effect SDS proposals will have on health and health inequalities, achieving sustainable development, climate change and its consequences and ensuring consistency with national policies and the EU obligations of the UK. The SDS must also deal with the aspects of other Combined Authority policies or proposals that involve spatial development considerations.
- 1.5 The SDS will be shaped by the overarching Combined Authority objective of 'creating a fairer, stronger, cleaner Liverpool City Region – where no one is left behind'. It is therefore expected to respond, within its scope, to climate and ecological emergencies; housing needs including affordability; employment related needs; sustainable travel; place and environmental quality; and inequalities. Within this context, it is envisaged that the SDS will include a spatial strategy, establishing principles and parameters for a number of broad locations where development of certain types should be directed towards, with the detail of specific site allocations and amount of development left as a matter to be developed at the local authority level through the Local Plan preparation process.
- 1.6 The SDS will also include thematic policies flowing from the overarching objectives. These policies will establish the high-level principles of the strategic planning policy response to key issues facing the region – these principles should then inform the preparation of more detailed policies by local authorities within their Local Plans. This approach aims to allow LCRCA to use the SDS as a means to safeguard the region against vulnerability to speculative, piecemeal development that does not benefit communities in the region. It will aim to promote development at the most sustainable locations and seek to maximise opportunities to secure and capitalise on the infrastructure needed for clean and inclusive growth.
- 1.7 It is also recognised that the way people are working, travelling and using their leisure time has changed significantly due to Coronavirus. The SDS offers an opportunity to take a fresh look at the needs of people in the region to plan for cleaner greener recovery, ensuring new development is resilient and contributes towards reducing carbon emissions.
- 1.8 The SDS will cover a period of at least 15 years from it being published (adopted) (anticipated 202/5) and will apply to the administrative boundary of LCRCA.



## Legislative Context

- 1.9 The UK left the EU on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 (“the Withdrawal Act”). This established a transition period, which ended on 31 December 2020. However, the most recent amendments to the Habitats Regulations - the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019<sup>1</sup> - make it clear that the need for HRA continues after Brexit.
- 1.10 The need for Appropriate Assessment (**Box 1**) is set out in the Conservation of Habitats and Species Regulations 2017 (as amended).
- 1.11 The HRA process applies the ‘Precautionary Principle’<sup>2</sup> to European sites. Plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the European site(s) in question. Plans and projects with predicted adverse impacts on European sites may still be permitted if there are no 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.
- 1.12 In order to ascertain whether or not site integrity will be affected, an Appropriate Assessment should be undertaken of the plan or project in question:

### 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”.*

- 1.13 The competent authority that carries out the HRA (in this case Liverpool City Region Combined Authority) is required to apply the precautionary principle to European sites and can only adopt a plan once it has been ascertained that it will not adversely affect the integrity of the site concerned. However, even if significant adverse effects on the designated site are predicted, and in the absence of a suitable alternative solution, the plan can still be adopted in exceptional circumstances where there are deemed sufficient imperative reasons of over-riding public interest (IROPI). In such cases, however, compensatory measures must be implemented.
- 1.14 In spring 2018 the ‘Sweetman’ European Court of Justice ruling<sup>3</sup> clarified that ‘mitigation’ (i.e., measures that are specifically introduced to avoid or reduce a harmful effect on a European 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.
- 1.15 In 2018 the Court of Justice of the European Union (CJEU) also ruled in combined cases C-293/17 and C-294/17 (often dubbed the Dutch Nitrogen case). The case related to atmospheric nitrogen deposition from agriculture and the concept of ‘headroom’ for further deposition. The Dutch government argued that because other measures they were taking (through a national programme known as the PAS) would reduce atmospheric nitrogen deposition considerably, this would create headroom for agricultural growth, such that individual farms would not need Appropriate Assessment or mitigation as long as they remained within that headroom. However, there was considerable uncertainty over the effectiveness of the PAS reductions, and even with the PAS reductions taken into account, large areas of the relevant European sites would still be

<sup>1</sup> these don't replace the 2017 Regulations but are just another set of amendments

<sup>2</sup> The Precautionary Principle, which is referenced in Article 191 of the Treaty on the Functioning of the European Union, has been defined by the United Nations Educational, Scientific and Cultural Organisation (UNESCO, 2005) as: “When human activities may lead to morally unacceptable harm [to the environment] that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm. The judgement of plausibility should be grounded in scientific analysis”.

<sup>3</sup> People Over Wind and Sweetman v Coillte Teoranta (C-323/17)

above the critical load (i.e. the empirically derived threshold below which damage could be ruled out with confidence). As a result, the Advocate-General advising the court disagreed with the Dutch Government on the basis of the degree of uncertainty over the effectiveness of the PAS, and that if the critical load was still exceeded there was effectively no headroom available since damage would still arise from further deposition. In other words, to create sufficient headroom at a national level to entirely avoid the need for Appropriate Assessment or mitigation, one would need to not just reduce nitrogen inputs from other sources but do so to such an extent the damage thresholds for the European site was no longer exceeded. The Court concurred, ruling that where a site is already in a deleterious state the room for permitting further harm is necessarily limited.

1.16 This SDS HRA is cognisant of these rulings.

## Relevant case law

1.17 As a consequence of the UK's exit from the EU, it was necessary for various amendments to be made to the Habitats Regulations. These changes were required to ensure that England and Wales (and Scotland through separate regulations) continue to maintain the same standard of protection afforded to European sites. The Habitats Regulations remain in force, including the general provisions for the protection of European sites and the procedural requirements to undertake HRA. The changes made were only those necessary to ensure that they remain operable following the UK's exit from the EU.

1.18 Although the UK is no longer part of the EU, a series of prior rulings of the Court of Justice of the European Union (CJEU) are relevant and have been considered when preparing this document. These rulings and their implications for this HRA are summarised in Table 1.

**Table 1. Case Law Relevant to the HRA of the SDS**

Case	Ruling	Relevance to the HRA of the SDS
People Over Wind and Sweetman v Coillte Teoranta (C-323/17)	The ruling of the CJEU in this case requires that any conclusion of 'no likely significant effect' on a European site must be made prior to any consideration of measures to avoid or reduce harm to the European site. The determination of likely significant effects should not, in the opinion of the CJEU, constitute an attempt at detailed technical analyses. This should be conducted as part of the Appropriate Assessment should be conducted as part of the appropriate assessment.	NatureScot has published guidance on the implications of this ruling for HRA (SNH, 2019). It will be necessary to distinguish between those measures which are intended to avoid or reduce harmful effects on a European site and those elements of the flood management plan that may incidentally provide some degree of mitigation, but which are intrinsic or essential parts of the plan itself. SNH advises that intrinsic parts of a plan can be considered at the screening stage of HRA. If it can be concluded that the Flood management plan area will have no adverse effect on any European site, in the absence of mitigation, it will be possible to conclude 'no likely significant effects', and the need for further detailed Appropriate Assessment will be 'screened out'.
Waddenzee (C-127/02)	The ruling in this case clarified that appropriate assessment must be conducted using best scientific knowledge, and that there must be no reasonable scientific doubt in the conclusions drawn.  The Waddenzee ruling also provided clarity on the definition of 'significant effect', which would be any effect from a plan or project which is likely to undermine the conservation objectives of any European site.	Adopting the precautionary principle, a 'likely' effect in this HRA is interpreted as one which is 'possible' and cannot be objectively ruled out.  The test of significance of effects has been conducted with reference to the conservation objectives of relevant European sites.
Holohan and Others v An Bord Pleanála (C-461/17)	The conclusions of the Court in this case were that consideration must be given during appropriate assessment to: <ul style="list-style-type: none"> <li>• effects on qualifying habitats and/or species of a SAC or SPA, even when occurring outside of the boundary of a European site, if these are relevant to the site meeting its conservation objectives, and;</li> </ul>	This relates to the concept of 'functionally-linked habitat', i.e., areas outside of the boundary of a European site which supports its qualifying feature(s). In addition, consideration must be given to non-qualifying features upon which qualifying habitats and/or species rely.

Case	Ruling	Relevance to the HRA of the SDS
	<ul style="list-style-type: none"> <li>effects on non-qualifying habitats and/or species on which the qualifying habitats and/or species depend and which could result in adverse effects on the integrity of the European site.</li> </ul>	
T.C Briels and Others v Minister van Infrastructuur en Milieu (C-521/12)	The ruling of the CJEU in this case determined that compensatory measures cannot be used to support a conclusion of no adverse effect on site integrity.	Compensation can only be considered at the relevant stage of HRA and not during appropriate assessment. Compensation must be delivered when appropriate assessment concludes that there will be adverse effects on site integrity.

## Quality Assurance

- 1.19 This report was undertaken in line with AECOM's Integrated Management System (IMS). Our IMS places great emphasis on professionalism, technical excellence, quality, environmental and Health and Safety management. All staff members are committed to establishing and maintaining our certification to the international standards BS EN ISO 9001:2015 and 14001:2015, ISO 44001:2017 and ISO 45001:2018. In addition, our IMS requires careful selection and monitoring of the performance of all sub-consultants and contractors.
- 1.20 All AECOM Ecologists working on this project are members (at the appropriate level) of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow their code of professional conduct (CIEEM, 2017).

## 2. Methodology

### Introduction to HRA Methodology

- 2.1 Project-related HRA often requires bespoke survey work and novel data generation in order to accurately determine the significance of 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.
- 2.2 However, there is a tacit acceptance that HRA can be tiered and that all impacts are not necessarily appropriate for consideration to the same degree of detail at all tiers as illustrated in Image 1 below.

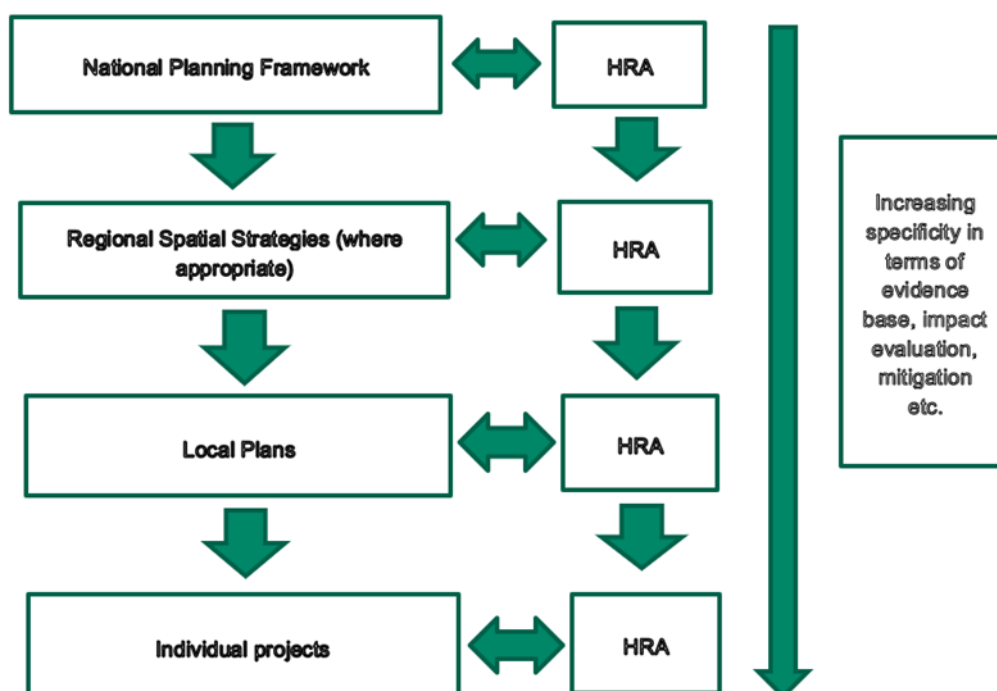


Image 1. Tiering in HRA of Land Use Plans

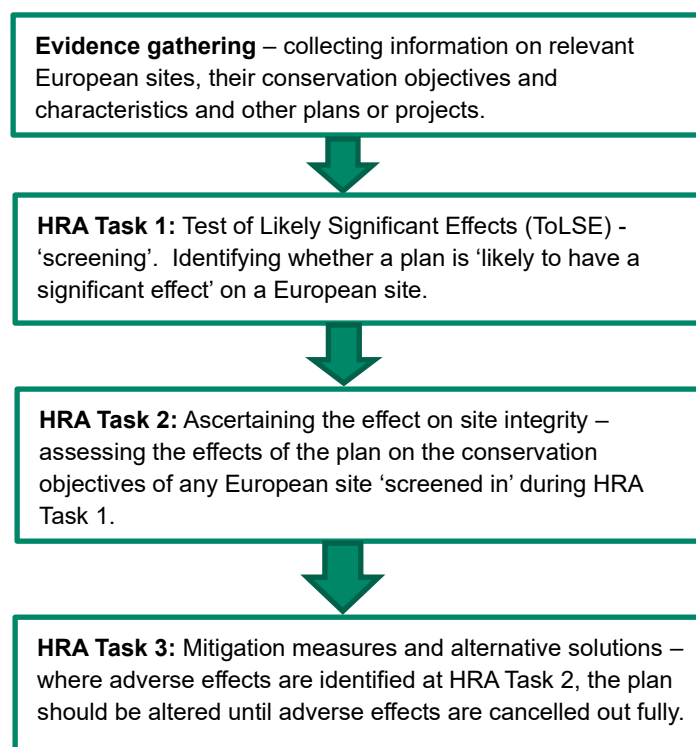
- 2.3 This HRA will be carried out with reference to the general EC guidance on HRA<sup>4</sup>; Natural England has produced its own internal guidance<sup>5</sup> as has the UK government<sup>6</sup>. These will be referred to in undertaking this HRA.
- 2.4 Image 2 below outlines the stages of HRA according to current guidance. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations and any relevant changes to the plan until no significant adverse effects remain.

<sup>4</sup> European Commission (2001): Assessment of plans and projects significantly affecting Natura 2000 Sites: Methodological Guidance on the Provisions of Article 6(3) and 6(4) of the Habitats Directive.

<sup>5</sup> [http://www.ukmpas.org/pdf/practical\\_guidance/HRGN1.pdf](http://www.ukmpas.org/pdf/practical_guidance/HRGN1.pdf)

<sup>6</sup> <https://www.gov.uk/guidance/appropriate-assessment>

Image 2. Four Stage Approach to Habitats Regulations Assessment. Source EC, 2011.



## Description of HRA Tasks

### HRA Task 1 – Test of Likely Significant Effects (ToLSE)

2.5 Following evidence gathering, the first stage of any Habitats Regulations Assessment is a Test of Likely Significant Effects (ToLSE) test - essentially a brief, high-level assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

- *"Is the project, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?"*

2.6 The objective is to 'screen out' those plans and projects that can, without any detailed appraisal, be concluded to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse interaction.

2.7 The ToLSE is based on identification of the Source of impact, the Pathway of that impact that exists to Receptors and then confirmation of the specific European Site receptors. These are normally designated features but also include habitats and species fundamental to those designated features achieving favourable conservation status (notably functionally linked land outside the European site boundary).

2.8 In the Waddenzee case<sup>7</sup>, the European Court of Justice ruled on the interpretation of Article 6(3) of the Habitats Directive, including that:

- An effect should be considered 'likely', *"if it cannot be excluded, on the basis of objective information, that it will have a significant effect on the site"* (para 44);
- An effect should be considered 'significant', *"if it undermines the conservation objectives"* (para 48); and
- Where a plan or project has an effect on a site *"but is not likely to undermine its conservation objectives, it cannot be considered likely to have a significant effect on the site concerned"* (para 47).

<sup>7</sup> Case C-127/02

- 2.9 The ToLSE consists of two parts: firstly, determining whether there are any policies that could result in negative impact pathways and secondly determining whether there are any European sites that might be affected.
- 2.10 This ToLSE report identifies European designated sites that could be affected by the SDS and also those impact pathways that are most likely to require consideration.
- 2.11 It is important to note that the ToLSE must generally follow the precautionary principle as its main purpose is to determine whether the subsequent stage of ‘appropriate assessment’ (i.e. a more detailed investigation) is required. A ToLSE is required for the SDS, although experience of the various LCR Local Plan HRA strongly indicates appropriate assessment will be required.

## HRA Task 2 – Appropriate Assessment (AA)

- 2.12 Where it is determined that a conclusion of ‘no Likely Significant Effect’ cannot be drawn, the analysis must proceed to the next stage of HRA known as Appropriate Assessment. Case law has clarified that ‘Appropriate Assessment’ is not a technical term. In other words, there are no particular technical analyses, or level of technical analysis, that are classified by law as belonging to appropriate assessment rather than ToLSE. Appropriate Assessment refers to whatever level of assessment is appropriate to form a conclusion regarding effects on the integrity (coherence of structure and function) of European sites in light of their conservation objectives.
- 2.13 By virtue of the fact that it follows the ToLSE process, there is a clear implication that the analysis will be more detailed than undertaken at the previous stage. 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 would take any policies or allocations that could not be dismissed following the high-level Likely Significant Effects Test analysis and assess the potential for an effect in more detail, with a view to concluding whether there would actually be an adverse effect on site integrity (in other words, disruption of the coherent structure and function of the European site(s)).
- 2.14 In 2018 the Holohan ruling<sup>8</sup> handed down by the European Court of Justice included among other provisions paragraph 39 of the ruling stating that ‘*As regards other habitat types or species, which are present on the site, but for which that site has not been listed, and with respect to habitat types and species located outside that site, ... typical habitats or species must be included in the appropriate assessment, if they are necessary to the conservation of the habitat types and species listed for the protected area*’ [emphasis added].
- 2.15 Where necessary, measures will be recommended for incorporation into the emerging SDS in order to avoid or mitigate adverse effects on European sites. There is considerable precedent, both nationally and locally, concerning the level of detail that a Plan document needs to contain regarding mitigation for recreational impacts on European sites, for example. The implication of this precedent is that it is not necessary for all measures that will be deployed to be fully developed prior to adoption of the SDS, but the SDS must provide an adequate policy framework within which these measures can be delivered.
- 2.16 In evaluating significance, AECOM will rely on professional judgement as well as the results of bespoke studies, supported by appropriate evidence/data, and previous stakeholder consultation regarding development impacts on the European sites considered within this assessment.
- 2.17 When discussing ‘mitigation’ for a SDS document, one is concerned primarily with the policy framework to enable the delivery of such mitigation rather than the details of the mitigation measures themselves since the SDS document is a high-level policy document.

## HRA Task 3 - Mitigation

- 2.18 Once the appropriate assessment has been completed there may be a requirement for mitigation. If required, this is most likely to consist of amendments to policy wording of the SDS (because detailed site allocations for development lie within the scope of the Local Plans), to ensure an adequate framework exists to protect European sites from any identified adverse effects.
- 2.19 Consideration will also be given to the role of the Environment Bill, new legislative requirements including Biodiversity Net Gain (BNG) and Local Nature Recovery Strategies. While land delivered to achieve BNG

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<sup>8</sup> Case C-461/17

- should not also be claimed as mitigation for impacts on European sites, there are ways in which the delivery of new habitats and greenspace as part of BNG requirements may reduce or entirely remove the need for mitigation for impacts on European sites. For example, if large areas of semi-natural greenspace are being provided as part of a general drive to achieve biodiversity net gain across the LCR this will also increase the amount of semi-natural greenspace away from the coast that is available for casual recreation (suitable alternative natural greenspace), thus reducing the risk of increased recreational activity being focussed on the coastal European sites.
- 2.20 LCR have established a natural capital baseline<sup>9</sup> for the region. The baseline includes an asset map of the region's habitat stock, natural capital, and ecosystem services valuation of the benefits that flow from the asset map.
- 2.21 The natural capital baseline will "...support the Liverpool City Region Combined Authority (LCRA) and Local Authorities (LA) to engage with and manage funds created by natural capital policy mechanisms and to enhance the economic and social welling of the LCR. These policy mechanisms include an Environmental Net Gain approach (including Biodiversity net gain), DEFRA's Environmental Land Management System (public money for public goods), as well as private investment in natural capital..."
- 2.22 Since both recreational pressure and loss of functionally linked habitat for the European sites are going to be issues requiring mitigation, there would be value in building a strong network of new greenspaces, large parks and accessible Green Infrastructure (GI) corridors into the SDS from the start, located appropriately to draw new residents away from sensitive European sites and to deliver other benefits. This natural capital baseline can also be used to target GI delivery across the region, providing a multi-functional GI approach across the LCR to feed into future mitigation, including the emerging LCR Recreational Mitigation Strategy. A challenge with HRA of any Spatial Development Strategy is that, intentionally, the SDS is broad in terms of quantum and location of growth across the area it covers. For example, precise and full determination of the impacts and significant effects of a large new mixed-use development will require extensive details concerning the design of the new housing sites, including layout of greenspace and type of development to be delivered in particular locations, yet these data will not be decided until subsequent stages. This information will not be available at SDS level but only developed for lower tier Local Plans.
- 2.23 Guidance from the Department for Levelling Up, Housing and Communities (DLUHC), formerly the Ministry of Housing, Communities and Local Government (MHCLG) makes it clear that when implementing HRA of land-use plans, the Appropriate Assessment (AA) should be undertaken at a level of detail that is appropriate and proportional to the level of detail provided within the plan itself and states that the HRA should be '*proportionate to the geographical scope of the [plan policy]*' and that '*an AA need not be done in any more detail, or using more resources, than is useful for its purpose*' (MHCLG, 2006, p.6)<sup>10</sup>.
- 2.24 "More recently, the Court of Appeal<sup>11</sup> ruled that providing the Council (competent authority) was duly satisfied that proposed mitigation could be 'achieved in practice' to satisfy that the proposed development would have no adverse effect, then this would suffice. This ruling has since been applied to a planning permission (rather than a Local Plan)<sup>12</sup>. In this case the High Court ruled that for '*a multistage process, so long as there is sufficient information at any particular stage to enable the authority to be satisfied that the proposed mitigation can be achieved in practice it is not necessary for all matters concerning mitigation to be fully resolved before a decision maker is able to conclude that a development will satisfy the requirements of Regulation 102 of the Habitats Regulations*'.
- 2.25 In other words, there is a tacit acceptance that AA can be tiered and that all impacts are not necessarily appropriate for consideration to the same degree of detail at all tiers. For example, when considering loss of functionally-linked habitat different levels of investigation are appropriate to the emerging SDS, Local Plans and subsequent planning applications. The fullest level of detail, including wintering bird surveys, would be necessary for planning applications at that is the last level at which impacts on European sites can be investigated. In contrast, detailed bird surveys would normally be disproportionate for a Local Plan, given that European sites can be protected in the absence of such surveys by having a strong policy dictating the need for further investigation and prohibiting development until surveys are complete.

<sup>9</sup> <https://www.liverpoolcityregion-ca.gov.uk/wp-content/uploads/LCR-Natural-Capital-Baseline-Report.pdf> [accessed 24/02/2021]

<sup>10</sup> MHCLG (2006) Planning for the Protection of Habitat sites, Consultation Paper

<sup>11</sup> No Adastral New Town Ltd (NANT) v Suffolk Coastal District Council Court of Appeal, 17<sup>th</sup> February 2015

<sup>12</sup> High Court case of R (Devon Wildlife Trust) v Teignbridge District Council, 28 July 2015

- 2.26 Similarly, in any SDS, there are numerous policies for which there is a limit to the degree of assessment that is possible at this plan level. This is because:
- The policy in question does not contain any specifics as to what will be delivered so literally cannot be assessed in detail at the plan level. In these cases, the appropriate assessment would focus on precautionary mitigation that can be included in the plan to ensure that whatever proposals come forward will not result in adverse effects on integrity; or
  - The nature of the potential impacts (notably lighting, noise and visual disturbance during construction, or loss of functionally-linked land or water) are very closely related to exactly how the development will be designed and constructed, or detailed development site-specific bird survey data, and therefore cannot be assessed in detail at the plan level and certainly not at the SDS level where site allocations will not be made. In these instances, the appropriate assessment focusses on the available mitigation measures, the extent to which such measures would be achievable and effective and whether an adequate protective framework exists to ensure that the policy would not lead to an adverse effect on the integrity of any European designated sites.
  - There are no site allocations as broad strategic locations are identified.
- 2.27 On these occasions the advice of Advocate-General Kokott<sup>13</sup> is worth considering. She commented that: *'It would ...hardly be proper to require a greater level of detail in preceding plans [rather than planning applications] or the abolition of multi-stage planning and approval procedures so that the assessment of implications can be concentrated on one point in the procedure. Rather, adverse effects on areas of conservation must be assessed at every relevant stage of the procedure to the extent possible on the basis of the precision of the plan. This assessment is to be updated with increasing specificity in subsequent stages of the procedure'* [emphasis added]. This is the approach that will be taken in the HRA of the SDS and is in line with the Ministry of Housing, Communities and Local Government (MHCLG) guidance and Court rulings that the level of detail of the assessment.
- 2.28 Therefore, when discussing the likelihood of significant effects or adverse effects on integrity for a high-level strategic plan such as the LCR SDS, which contains no site allocations and only a minimum indication of growth quantum across the Liverpool City Region or per district/authority, one is concerned primarily with establishing an overarching policy framework that will enable and require:
- Any further investigations required at the Local Plan level and how those investigations should proceed (for example, detailing any specific further assessment that is required for all housing development within a certain distance of a specific European site, along with examples of mitigation that may be needed for such development);
  - Constraints that must be taken into account by local authorities in selecting site allocations;
  - Any strategic multi-authority mitigation strategies that may be required, to ensure a consistent multi-authority approach, such as relating to recreational pressure or loss of functionally-linked habitat;
  - Any strategic multi-authority modelling (e.g. for air quality) or surveys (e.g. for recreational pressure) that may be required, to ensure a consistent multi-authority approach;
  - Development that would adversely affect the integrity of European sites and functionally linked habitat to only come forward once adequate mitigation (if needed) was devised; and
  - The presence of a mitigation scheme or approach, rather than the details of the mitigation measures themselves which would be devised for the Local Plans.
- 2.29 It is that policy framework that will enable the HRA of the SDS to conclude that the plan will not result in adverse effects on European sites because of safeguards built into the delivery mechanism.
- 2.30 Most LCR local authorities have recently adopted Local Plans or are currently undergoing Examination of their Local Plans so may not be revising their Local Plans until the formal 5-year Local Plan Review requirement is triggered. For many of the Local Plans this will be post-publication of the SDS. As such, there is a significant opportunity for the SDS and its HRA to guide and feed into the next generation of Local Plans for the LCR.

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<sup>13</sup> Opinion of Advocate General Kokott, 9th June 2005, Case C-6/04. Commission of the European Communities v United Kingdom of Great Britain and Northern Ireland, paragraph 49 <http://curia.europa.eu/juris/document/document.jsf?docid=58359&doclang=EN>



## Assessment ‘in combination’

- 2.31 It is a requirement of the Regulations that the impacts and effects of any land use plan being assessed are not considered in isolation but in combination with other plans and projects that may also be affecting the European site(s) in question.
- 2.32 When undertaking this part of the assessment it is essential to bear in mind the principal intention behind the legislation, i.e., to ensure that those projects or plans which in themselves have minor impacts are not simply dismissed on that basis but are evaluated for any cumulative contribution they may make to an overall significant effect. In practice, ‘in combination assessment’ is of greatest importance when the policy would otherwise be screened out because the individual contribution is inconsequential. The overall approach is to exclude the risk of there being unassessed likely significant effects in accordance with the precautionary principle. This was first established in the seminal Waddenzee<sup>14</sup> case.
- 2.33 It is important to avoid double-counting since projects that deliver housing and employment in the North West of England are part of the individual Local Plans. In these instances, the development of a planning application essentially provides further detail on those aspects of Local Plan growth rather than presenting a new project.
- 2.34 Similarly, where housing and employment is being delivered in surrounding authorities, this is captured in the ‘in combination’ assessment through consideration of the relevant Local Plan that sets out the total amount of housing and employment growth that will be delivered across that authority during its plan period.
- 2.35 The principal other plans and projects of relevance regarding in-combination effects are:
- **Local Plan documents for authorities within the Combined Authority area and those of surrounding authorities:**
    - The Liverpool Local Plan 2013 – 2033 (adopted in January 2022) <https://liverpool.gov.uk/planning-and-building-control/plan-making-in-liverpool/the-liverpool-local-plan-2013-2033/>; a Local Plan review is currently starting
    - Knowsley Local Plan Core Strategy 2013 - 2028 (adopted January 2016) <https://localplanmaps.knowsley.gov.uk/documents/knowsley-local-plan-adopted-core-strategy.pdf>
    - St Helens Borough Local Plan up to 2037 (adopted July 2022) <https://sthelens.gov.uk/localplan>
    - Halton Local Plan 2014 – 2031 (adopted March 2022) <https://www3.halton.gov.uk/Pages/planning/policyguidance/planningplans.aspx>
    - A Local Plan for Sefton 2015 - 2030 (adopted April 2017) <https://www.sefton.gov.uk/localplan>
    - Emerging Wirral Local Plan 2021 – 2037 <https://www.wirral.gov.uk/sites/default/files/all/planning%20and%20building/Local%20plans%20and%20planning%20policy/Examination%20Library/1.%20Proposed%20Submission%20Documents/SD1%20-%20Wirral%20Local%20Plan%202021-2037%20Submission%20Draft%20May%202022%20for%20Reg%2019%20Publication-Final%20260422-compressed.pdf>; currently going through examination
    - Wirral Unitary Development Plan (adopted February 2000, to be replaced by the Emerging Local Plan) <https://www3.wirral.gov.uk/udp/>
    - Emerging Warrington Local Plan [https://www.warrington.gov.uk/sites/default/files/2021-09/warrington\\_updated\\_proposed\\_submission\\_version\\_local\\_plan\\_upsvlp\\_2021-2038\\_-\\_september\\_2021.pdf](https://www.warrington.gov.uk/sites/default/files/2021-09/warrington_updated_proposed_submission_version_local_plan_upsvlp_2021-2038_-_september_2021.pdf); awaiting adoption as of November 2023
    - Cheshire West and Chester Local Plan (Part One) Strategic Policies (adopted January 2015) <https://consult.cheshirewestandchester.gov.uk/kse/event/24907/section/3252243>
    - Cheshire West and Chester Local Plan (Part Two) Land Allocations and Detailed Policies (adopted July 2019) <https://consult.cheshirewestandchester.gov.uk/kse/event/34617/section/5428432>

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<sup>14</sup> Waddenzee case (Case C-127/02, [2004] ECR-I 7405)

- West Lancashire Local Plan 2012 – 2027 (adopted 2013)  
[https://www.westlancs.gov.uk/media/546038/wllp\\_oct-2013.pdf](https://www.westlancs.gov.uk/media/546038/wllp_oct-2013.pdf)
- Places For Everyone Joint Development Plan Document – Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford, Wigan – <https://www.greatermanchester-ca.gov.uk/media/4838/places-for-everyone.pdf> ; now at main modifications stage
- Flintshire Local Development Plan 2015 – 2030 (adopted 2023)  
<https://www.flintshire.gov.uk/en/Resident/Planning/Flintshire-Local-Development-Plan.aspx>
- Wrexham Local Development Plan 2 (LDP2) 2013 - 2028  
<https://www.wrexham.gov.uk/service/development-plans-and-other-planning-policy/wrexham-local-development-plan-2-ldp2-2013-2028>
- **Minerals and Waste Plans:**
  - Halton Council, Knowsley Council, Liverpool City Council, Sefton Council, St.Helens Council and Wirral Council Joint Waste Local Plan 2013 <https://www.wirral.gov.uk/planning-and-building/local-plans-and-planning-policy/local-plans/joint-waste-local-plan-merseyside>
  - Wirral Local Plan Minerals Report (January 2022)  
<https://www.wirral.gov.uk/sites/default/files/all/planning%20and%20building/Local%20plans%20and%20planning%20policy/Examination%20Library/7.%20Economy%20and%20Employment/E4%20Wirral%20Local%20Plan%20Minerals%20Report%202022.pdf>
  - Greater Manchester Joint Waste Development Plan (adopted April 2012)  
<https://www.trafford.gov.uk/planning/strategic-planning/local-plan/greater-manchester-joint-waste-development-plan-document.aspx>
- **Transport Plans:**
  - Merseyside and Halton Local Transport Plan (LTP3) 2011 – 2026  
<https://www3.halton.gov.uk/Pages/councildemocracy/TransportPolicy.aspx>
  - Liverpool City Region Combined Authority Local Transport Plan (LTP4) 2040 (1st Stage Consultation April 2022) <https://www.liverpoolcityregion-ca.gov.uk/wp-content/uploads/LTP4-VISION-090522.pdf>
- **Water Resources Management Plans:**
  - United Utilities Final Water Resources Management Plan 2019  
[https://www.unitedutilities.com/globalassets/z\\_corporate-site/about-us-pdfs/wrmp-2019---2045/final-water-resources-management-plan-2019.pdf](https://www.unitedutilities.com/globalassets/z_corporate-site/about-us-pdfs/wrmp-2019---2045/final-water-resources-management-plan-2019.pdf)
  - United Utilities Final Drought Plan 2022 [https://www.unitedutilities.com/globalassets/z\\_corporate-site/about-us-pdfs/final-drought-plan-2022/final-drought-plan-2022.pdf](https://www.unitedutilities.com/globalassets/z_corporate-site/about-us-pdfs/final-drought-plan-2022/final-drought-plan-2022.pdf)
  - [United Utilities Revised Draft Water Resources Management Plan 2024 \(June 2023\)](https://www.unitedutilities.com/globalassets/z_corporate-site/about-us-pdfs/wrmp24-drafts/revised-draft-wrmp24-main-report.pdf)  
[https://www.unitedutilities.com/globalassets/z\\_corporate-site/about-us-pdfs/wrmp24-drafts/revised-draft-wrmp24-main-report.pdf](https://www.unitedutilities.com/globalassets/z_corporate-site/about-us-pdfs/wrmp24-drafts/revised-draft-wrmp24-main-report.pdf)
  - [United Utilities Water Drainage and Wastewater Management Plan 2023. Document Reference: DP1 \(May 2023\)](https://www.unitedutilities.com/globalassets/z_corporate-site/about-us-pdfs/wrmp24-drafts/revised-draft-wrmp24-main-report.pdf)<sup>15</sup>
  - Dŵr Cymru Welsh Water Final Water Resources Management Plan 2019  
<file:///C:/Users/rigbyl/Downloads/Final%20Water%20Resources%20Management%20Plan%202019%20-%20Main%20Technical%20Report.pdf>
  - Dŵr Cymru Welsh Water Revised Draft Water Resources Management Plan 2024 (June 2023)  
<https://www.dwrcymru.com/en/our-services/water/water-resources/draft-water-resources-management-plan-2024>
- **Coastal Plans:**
  - Great Ormes Head to Scotland Shoreline Management Plan (SMP) 22  
<https://www.mycoastline.org.uk/shoreline-management-plans/>

<sup>15</sup> [https://www.unitedutilities.com/globalassets/z\\_corporate-site/about-us-pdfs/dwmp-2023/dp1-main-document.pdf](https://www.unitedutilities.com/globalassets/z_corporate-site/about-us-pdfs/dwmp-2023/dp1-main-document.pdf)

- National Flood and Coastal Erosion Risk Management Strategy for England 2020 – 2100  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/920944/023\\_15482\\_Environment\\_agency\\_digitalAW\\_Strategy.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/920944/023_15482_Environment_agency_digitalAW_Strategy.pdf)
- Sefton Coast Plan 2030 and beyond (adopted 2017)  
<https://modgov.sefton.gov.uk/documents/s70764/Appendix%201.%20Sefton%20Coast%20Plan.pdf>
- **Climate Emergency Plans:**
  - Climate Emergency Action Plans
- **Individual Projects:**
  - Northern Powerhouse Strategy
  - Liverpool Waters
  - Liverpool 2
  - Liverpool John Lennon Airport Master Plan
  - Mersey Tidal Power Project (currently at the Pre-Scoping stage)

2.36 It should be noted that rather than undertaking HRA of the individual projects and plans listed above, the SDS HRA will draw upon those HRAs of the projects and plans listed above in drawing its conclusions.

## Physical Scope of the HRA

2.37 There are no standard criteria for determining the ultimate physical scope of an HRA. Rather, the source-pathway-receptor model should be used to determine whether there is any potential pathway connecting development to any European sites. In the case of the LCRCA area, it was decided that this HRA would focus on the European sites shown in Table 2.

**Table 2. European sites for consideration and their location in relation to the Liverpool City Region Combined Authority boundary**

European Site	Location
Mersey Estuary SPA	Located within the LCRCA boundary (Liverpool City, Halton and Wirral).
Mersey Estuary Ramsar site	
Mersey Narrows and North Wirral Foreshore SPA	Located within the LCRCA boundary (Sefton and Wirral)
Mersey Narrows and North Wirral Foreshore Ramsar site	
The Dee Estuary/ Aber Dyfrdwy SAC	Located within the LCRCA boundary (Wirral)
The Dee Estuary SPA	
The Dee Estuary Ramsar site	
Sefton Coast SAC	Located within the LCRCA boundary (Sefton)
Ribble and Alt Estuaries SPA	Located within the LCRCA boundary (Sefton)
Ribble and Alt Estuaries Ramsar site	
Liverpool Bay/ Bae Lerwpl SPA	Located within the LCRCA boundary (Liverpool City, Sefton and Wirral)
Martin Mere SPA	Located approximately (c.)5km from the LCRCA boundary
Martin Mere Ramsar site	
Manchester Mosses SAC	Located c.5.4km from the LCRCA boundary
Halkyn Mountain/ Mynydd Helygain SAC	Located c.5.5km from the LCRCA boundary
Deeside and Buckley Newt Sites SAC	Located c.9km from the LCRCA boundary
Oak Mere SAC	Located c.10.4km from the LCRCA boundary
Alyn Valley Wood/ Coedwigoedd Dyffryn Alun SAC	Located c.12km from the LCRCA boundary
River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC	Located c.12.5km from the LCRCA boundary

## European Site

## Location

River Eden SAC

Located c.90km from the LCRCA boundary. The site has been included as Haweswater is likely to become a principal reservoir for Merseyside and is within the catchment of the River Eden SAC.

Source: *Magic* [www.magic.defra.gov.uk](http://www.magic.defra.gov.uk)

2.38 The reason for designation, conservation objectives, supplementary advice and environmental vulnerabilities of the European sites are detailed in Appendix A., Appendix B, Figure 1.B shows these European sites in relation to the boundary of the LCRCA boundary. This was based upon a 30km search zone around the LCRCA boundary. It should be noted that the presence of a conceivable pathway linking the LCRCA area to a European site does not mean that LSEs will occur.

2.39 The scoping process also evaluated whether pathways existed to the following European sites, but it was concluded that they could be scoped out of consideration:

- Rixton Clay Pits SAC – This site is designated for its populations of great crested newts. The pits are not fed by ground water but by surface water. As such there is no realistic pathway present to development in the Liverpool City Region<sup>16</sup>;
- Midland Meres and Mosses Phase 1 & Phase 2 Ramsar site - Located within 10km of Halton. Due to the distance of these sites from the borough, there are no realistic linking impact pathways to the environmental vulnerabilities of these sites (invasive non-native species and hydrological changes as a result of runoff.).
- West Midlands Mosses SAC – The site is potentially vulnerable to changes in air quality and is located close to the A49 and lies within 10km of Halton. However, the site lies more than 200m from the A49 which is outside the core impact zone with regard to local air quality (see Chapter 3 for further discussion of this zone).
- Rostherne Mere Ramsar site – Located approximately 14km from Halton. The site is vulnerable to changes in hydrology as a result of agricultural runoff. Due to the distance involved, it is considered that there are no realistic impact pathways present.
- Llwyn SAC – Located 20.4km from the LCRCA boundary. Due to the distance of these sites from the borough, there are no realistic linking impact pathways to the environmental vulnerabilities of this site (forestry and plantation activities, invasive non-native species, changes in hydraulic conditions).
- Elwy Valley Woods/ Coedwigoedd Dyffryn Elwy SAC – Located 20.4km from the LCRCA boundary. Due to the distance of these sites from the borough, there are no realistic linking impact pathways to the environmental vulnerabilities of this site (forestry and plantation activities, grazing, pollution, invasive non-native species)

<sup>16</sup> Development within 500m of the SAC might cause loss of functionally-linked habitat but the SDS will not cover habitat within this zone as the SAC is in Warrington and the Warrington Local Plan does not allocate any growth within 500m.

## 3. Impact Pathways

### Impact Pathways for Consideration

3.1 This section discusses potential impact pathways that could potentially link the SDS to a European site (as identified in **Chapter 2**). These are briefly identified in Table 3. Where existing evidence exists in relation to a specific impact pathway or a European site, further discussion is undertaken in the subsequent section. This list has been derived from the Site Improvement Plans, Ramsar Information Sheets, Conservation Objectives, Supplementary Advice on the Conservation Objectives and professional judgement based on extensive experience of HRA in the LCR. It is subject to revision as the SDS HRA process moves through each stage.

**Table 3. Potential Impact Pathways that Could Link the SDS to a European Site**

European Site	Potential Linking Impact Pathways
Mersey Estuary SPA/ Ramsar	Recreational pressure Public access/ disturbance Water quality Coastal squeeze Loss of functionally-linked habitat Renewable energy Global trade
Mersey Narrows and North Wirral Foreshore SPA/ Ramsar	Public access/ disturbance Coastal squeeze Water quality Loss of functionally-linked habitat Renewable energy Global trade
The Dee Estuary SAC	Public access/ disturbance Coastal squeeze Water pollution Inappropriate coastal management Wildfire/ arson Air pollution: impact of atmospheric nitrogen deposition Physical modification i.e., impacts of reduced freshwater inputs flushing through the Estuary i.e., water quantity
The Dee Estuary SPA	Public access/ disturbance Water quality Coastal squeeze Physical modification i.e., impacts of reduced freshwater inputs flushing through the Estuary i.e., water quantity Loss of functionally-linked habitat Renewable energy Global trade
The Dee Estuary Ramsar	Public access/ disturbance Water quality Coastal squeeze Air quality: impact of atmospheric pollution and resulting nitrogen deposition Loss of functionally-linked habitat Renewable energy Global trade
Sefton Coast SAC	Coastal squeeze Hydrological changes Public access/ disturbance Air quality: impact of atmospheric pollution and resulting nitrogen deposition

European Site	Potential Linking Impact Pathways
	Inappropriate coastal management Loss of, and disturbance to, functionally linked habitat Wildfire/ direct impact from third party arson Invasive species
Ribble and Alt Estuaries SPA	Public access/ disturbance Water quality Coastal squeeze Loss of functionally-linked habitat Renewable energy Global trade
Ribble and Alt Estuaries Ramsar	Recreational pressure Visual/ noise disturbance Water quality Coastal squeeze Loss of functionally-linked habitat Renewable energy Global trade Air pollution: impact of atmospheric pollution and resulting nitrogen deposition on natterjack toad habitat
Liverpool Bay/ Bae Lerwpl SPA	Public access/ disturbance Recreational pressure Water quality Coastal squeeze Loss of functionally-linked habitat Renewable energy Global trade
Martin Mere SPA/ Ramsar	Recreational pressure Renewable energy policies Loss of functionally-linked habitat
Manchester Mosses SAC	Air quality: impact of atmospheric pollution and resulting nitrogen deposition
Halkyn Mountain/ Mynydd Helygain SAC	Air quality: impact of atmospheric pollution and resulting nitrogen deposition
Deeside and Buckley Newt Sites SAC	Air quality: impact of atmospheric pollution and resulting nitrogen deposition
Oak Mere SAC	Air quality: impact of atmospheric pollution and result nitrogen deposition
Alyn Valley Woods/ Coedwigoedd Dyffryn Alun SAC	Outdoor sports and leisure activities, recreational activities Air quality: impact of atmospheric pollution and resulting nitrogen deposition Invasive non-native species
River Dee and Bala Lake, Afon Dyfrdwy a Llyn Tegid SAC	Recreational pressure Water quality and resources
River Eden SAC	Water quality and resources

## Background to Recreational Pressure/ Public Access/ Disturbance

3.2 There is concern over the cumulative impacts of recreation on key nature conservation sites in the UK, as most sites must fulfill conservation objectives while also providing recreational opportunity. Various research reports have provided compelling links between changes in housing and access levels and impacts on

- European protected sites<sup>17 18</sup>. While many European sites are vulnerable to recreation, housing growth has particularly strong impacts in sites designated for their bird interest. HRAs of planning documents tend to focus on recreational sources of disturbance as a result of new residents<sup>19</sup>.
- 3.3 All of the Local Plans across the Liverpool City Region (LCR) include housing targets and policies for tourism which have the potential to increase recreational pressure on designated sites. In recognition of this, work is ongoing in the preparation of a Recreation Mitigation Strategy (RMS). LCR authorities bringing forward Local Plans prior to that date have been required to prepare and implement an 'Interim Approach' that demonstrates avoidance and mitigation of recreational effects on European sites. The LCR authorities together with West Lancashire Borough Council have recently consulted on a Recreation Mitigation on the Coast Supplementary Planning Document Scoping Report (August 2023)<sup>20</sup>. Once adopted, this will replace the current interim approaches several of the Councils have in place.
- 3.4 Recently submitted Local Plans have also set out a commitment to finalising and adopting the RMS – these Local Plans are Liverpool, Halton and St Helens and Wirral.
- 3.5 Merseyside Environmental Advisory Service (MEAS) have also prepared the 'Towards a Liverpool City Region European Sites Recreation Mitigation & Avoidance Strategy Evidence Report (Version 24), July 2023'<sup>21</sup> and a Liverpool City Region and West Lancashire Visitor Surveys 2012-22 report<sup>22</sup>.
- 3.6 Data from Natural England's Monitor of Engagement with the Natural Environment (MENE) study<sup>23</sup> has been used to determine how far people travel to visit the countryside. The data shows that during 2018/19 most visits to nature were taken on foot and, over time, visits close to home have increased the most with 44% of visits were taken within 1 mile (1.6 km) of respondent's homes, 24% were within 1 to 2 miles (1.6 – 3.2 km) and 17% were within 3 to 5 miles (4.8 – 8.0 km). That data also showed that majority of visits to the natural environment taken in 2018/19 involved walking, with similar proportions walking with or without a dog.
- 3.7 Weitowitz et al (2019)<sup>24</sup> demonstrated '*that more housing consistently means more visitors to protected sites, across most habitats. This is particularly the case for on-foot visitors that originate from housing within 1.5km, highlighting that additional housing development in proximity to protected sites is likely to significantly increase recreation pressure. For visitor numbers at parking locations, levels of housing within 15km of protected sites were also a significant predictor but depended on habitat type.*' The study found that people on foot tend to stay within 1.5 km of their homes, which is consistent with the MENE survey mentioned above and those who travelled favoured sites with water features i.e., coastal, estuaries, other waterbodies.
- 3.8 A study on recreational activity on the north-west coast<sup>25</sup> found that 97% of recreational visitors to the north-west coastal European sites and SSSIs were on a short visit directly from home and interviewees visiting directly from home typically lived within a short radius of the survey point (a mean distance of 5.3 km). Half of these interviewees lived within 1.9 km (median value) and three quarters within 5.2km. For the Mersey Estuary SPA, 75% of people visiting the site from home lived within 8.3km of the survey point, although this was only based on a single survey location. Most of these lived along the coast, within easy access of the coast (e.g. clear line along the A595) or within highly populated areas (e.g. Liverpool).

<sup>17</sup> Liley D, Clarke R.T., Mallord J.W., Bullock J.M. 2006a. The effect of urban development and human disturbance on the distribution and abundance of nightjars on the Thames Basin and Dorset Heaths. Footprint Ecology report for Natural England.

<sup>18</sup> Liley D., Clarke R.T., Underhill-Day J., Tyldesley D.T. 2006b. Evidence to support the appropriate Assessment of development plans and projects in south-east Dorset. Footprint Ecology report for Dorset County Council.

<sup>19</sup> The RTP1 report 'Planning for an Ageing Population' (2004) which states that 'From being a marginalised group in society, the elderly are now a force to be reckoned with and increasingly seen as a market to be wooed by the leisure and tourist industries. There are more of them and generally they have more time and more money.' It also states that 'Participation in most physical activities shows a significant decline after the age of 50. The exceptions to this are walking, golf, bowls and sailing, where participation rates hold up well into the 70s'.

<sup>20</sup> [https://www.sefton.gov.uk/media/7078/recreation\\_mitigation\\_at\\_the\\_coast\\_spd\\_scoping\\_final\\_8-8-23.pdf](https://www.sefton.gov.uk/media/7078/recreation_mitigation_at_the_coast_spd_scoping_final_8-8-23.pdf)

<sup>21</sup> [http://www.meas.org.uk/media/11039/LCR\\_RMS\\_EvidenceReport\\_v24\\_Optv2.pdf](http://www.meas.org.uk/media/11039/LCR_RMS_EvidenceReport_v24_Optv2.pdf)

<sup>22</sup> [LCR and West Lancs visitor survey report - final v3.pdf \(meas.org.uk\)](https://www.meas.org.uk/media/11039/LCR_RMS_EvidenceReport_v24_Optv2.pdf)

<sup>23</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/828552/Monitor\\_Engagement\\_Natural\\_Environment\\_2018\\_2019\\_v2.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/828552/Monitor_Engagement_Natural_Environment_2018_2019_v2.pdf) (accessed 08/07/2020)

<sup>24</sup> Weitowitz, D.C; Panter, C; Hoskin, R; Liley, D (2019) *The effect of urban development on visitor numbers to nearby protected nature conservation sites*. Journal of Urban Ecology, 1-12

<sup>25</sup> Liley, D., Panter, C., Marsh, P. & Roberts, J. (2017) Recreational activity and interactions with birds within the SSSIs on the North-West coast of England

- 3.9 A study on the recreational users of Sefton's Natural Coast<sup>26</sup> estimated that half of the recreational users to be 'local residents' (i.e. residents within the Borough of Sefton). With respect to reasons for visiting the coast the main reason cited by over half of the respondents was either dog walking/walking/fresh air or visiting the coast. Nature based attractions including visiting the red squirrels, bird watching, and fishing accounted for approximately 20% of the visitors. The majority of visitors were focused on Formby and Crosby.
- 3.10 The study did not explore where the remaining 50% of visitors (i.e. not local residents from Sefton) came from. However, since Liverpool is located just 4.5km from the Sefton Coast SAC at its closest point it is considered likely that Liverpool will be one of the primary sources of visitors to the SAC from the LCR, after Sefton itself.
- 3.11 Studies across a range of species have shown that the effects from recreation can be complex. Human activity can affect birds either directly (e.g. by eliciting flight responses) or indirectly (e.g. through damaging their habitat or reducing their fitness in less obvious ways). The most obvious direct effect is that of immediate mortality such as death by shooting, but human activity can also lead to much subtler behavioural (e.g. alterations in feeding behaviour, avoidance of certain areas and use of sub optimal areas etc.) and physiological changes (e.g. an increase in heart rate). While these are less noticeable, they might result in major population-level changes by altering the balance between immigration / birth and emigration / death<sup>27</sup>.
- 3.12 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<sup>28</sup>. Disturbance therefore risks increasing energetic expenditure of birds while reducing their energetic intake, which can adversely affect the 'condition' and ultimately survival of the birds. Additionally, displacement of birds from one feeding site to others can increase the pressure on the resources available within the remaining sites, which then must sustain a greater number of birds<sup>29</sup>. Moreover, the higher proportion of time a breeding bird spends away from its nest, the more likely it is that eggs will cool and the more vulnerable they, or any nestlings, are to predators. Recreational pressure effects on ground-nesting birds are particularly severe, with many studies concluding that urban sites support lower densities of key species, such as stone curlew and nightjar<sup>30 31</sup>.
- 3.13 Several factors (e.g. seasonality, type of recreational activity) may have pronounced impacts on the nature of bird disturbance. Disturbance in winter can be more impactful because food shortages make birds more vulnerable at this time of the year. In contrast, there are often fewer recreational users in the winter months and disturbance impacts may be reduced because birds are not breeding. Furthermore, evidence in the literature suggests that the magnitude of disturbance clearly differs between different types of recreational activities. For example, dog walking leads to a significantly higher reduction in bird diversity and abundance compared to hiking<sup>32</sup>. Scientific evidence also suggests that key disturbance parameters, such as areas of influence and flush distance, are significantly greater for dog walkers than hikers<sup>33</sup>. Furthermore, differences in on-site route lengths and usage patterns likely imply that key spatial and temporal parameters (such as the area of a site potentially impacted and the frequency of disturbance) will also differ between recreational activities. This suggests that activity type is a factor that should be taken into account in HRAs.

## Non-breeding birds (September to March)

- 3.14 The following European sites lie within, or within 5km of the LCRCA boundary:
- Mersey Estuary SPA/ Ramsar
  - Mersey Narrows and North Wirral Foreshore SPA/ Ramsar

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<sup>26</sup> England's North West Research Service for Economic Development and Tourism (May 2009) Sefton's Natural Coast Local Users of the Coast (Version 2)

<sup>27</sup> Riley, J. 2003. Review of Recreational Disturbance Research on Selected Wildlife in Scotland. *Scottish Natural Heritage*.

<sup>28</sup> Riddington, R. *et al.* 1996. The impact of disturbance on the behaviour and energy budgets of Brent geese. *Bird Study* **43**:269-279

<sup>29</sup> Gill, J.A., Sutherland, W.J. & Norris, K. 1998. The consequences of human disturbance for estuarine birds. *RSPB Conservation Review* **12**: 67-72

<sup>30</sup> Clarke R.T., Liley D., Sharp J.M., Green R.E. 2013. Building development and roads: Implications for the distribution of stone curlews across the Brecks. *PLOS ONE*. doi:10.1371/journal.pone.

<sup>31</sup> Liley D., Clarke R.T. 2003. The impact of urban development and human disturbance on the numbers of nightjar *Caprimulgus europaeus* on heathlands in Dorset, England. *Biological Conservation* **114**: 219-230.

<sup>32</sup> Banks P.B., Bryant J.Y. 2007. Four-legged friend or foe? Dog walking displaces native birds from natural areas. *Biology Letters* **3**: 14pp.

<sup>33</sup> Miller S.G., Knight R.L., Miller C.K. 2001. Wildlife responses to pedestrians and dogs. 29: 124-132.



- The Dee Estuary SPA/ Ramsar
  - Ribble and Alt Estuaries SPA/ Ramsar
  - Liverpool Bay/ Bae Lerwpl SPA
  - Martin Mere SPA/ Ramsar
- 3.15 These sites are all designated for overwintering waterfowl and waders, which are sensitive to recreational pressure. This section discusses academic research available on these groups of birds.
- 3.16 Evans & Warrington found that on Sundays, total water bird numbers (including shoveler and gadwall) were 19% higher on Stocker's Lake LNR in Hertfordshire and attributed this to observed greater recreational activity on surrounding water bodies at weekends relative to weekdays displacing birds into the LNR. However, in this study, recreational activity was not quantified in detail, nor were individual recreational activities evaluated separately.
- 3.17 Tuite et al<sup>34</sup> used a large (379 sites), long-term (10-year) dataset (September – March species counts) to correlate seasonal changes in wildfowl abundance with the presence of various recreational activities. They determined that the shoveler was one of the most sensitive species to water-based activities, such as sailing, windsurfing and rowing. Studies on recreation in the Solent have established that human leisure activities cause direct disturbance to wintering waterfowl populations<sup>35, 36</sup>.
- 3.18 A study on recreational disturbance in the Humber<sup>37</sup> assesses different types of noise disturbance on waterfowl referring to previous research relating to aircraft (see Drewitt 1999<sup>38</sup>), traffic (Reijnen, Foppen, & Veenbaas 1997<sup>39</sup>), dogs (Lord, Waas, & Innes 1997<sup>40</sup>; Banks & Bryant 2007<sup>41</sup>) and machinery (Delaney et al. 1999; Tempel & Gutierrez 2003). It identifies that there is still relatively little work on the effects of different types of water-based craft and the impacts from jet skis, kite surfers, windsurfers etc., (see Kirby et al. 2004 for a review<sup>42</sup>). In general terms, both distance from the source of disturbance and the scale of the disturbance (noise level, group size) is likely to influence bird responses (Delaney et al. 1999<sup>43</sup>; Beale & Monaghan 2005<sup>44</sup>). On UK estuaries and coastal sites, a review of WeBS data showed that among the volunteer WeBS surveyors, driving of motor vehicles and shooting were the two activities most perceived to cause disturbance (Robinson & Pollitt 2002<sup>45</sup>).
- 3.19 Generally, disturbing activities present themselves on a continuum. Activities that involve irregular, infrequent and loud noise events, movement or vibration are likely to be most disturbing. For example, the presence of dogs around water bodies generate substantial disturbance due the type of habitats accessed (e.g., intertidal mudflats and saltmarsh), the area affected and dogs' impacts on bird behaviour. Birds are least likely to be disturbed by activities that involve regular, frequent, predictable and quiet patterns of sound, movement or vibration. The further any activity is from the birds, the less likely it is to result in disturbance. Overall, the factors that determine species responses to disturbance include species sensitivity, timing/duration of the recreational activity and the distance between source and receptor of disturbance.

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<sup>34</sup> Tuite, C.H., Hanson, P.R. & Owen, M. 1984. Some ecological factors affecting winter wildfowl distribution on inland waters in England and Wales and the influence of water-based recreation. *Journal of Applied Ecology* **21**: 41-62

<sup>35</sup> Footprint Ecology. 2010. Recreational Disturbance to Birds on the Humber Estuary.

<sup>36</sup> Footprint Ecology, Jonathan Cox Associates & Bournemouth University. 2010. Solent Disturbance and Mitigation Project – various reports.

<sup>37</sup> Fearnley H., Liley D. & Cruickshanks K. (2012) Results of Recreational Visitor Survey across the Humber Estuary. Footprint Ecology.

<sup>38</sup> Drewitt, A. (1999) Disturbance effects of aircraft on birds. *English Nature Reports*, Peterborough.

<sup>39</sup> Reijnen, R., Foppen, R. & Veenbaas, G. (1997) Disturbance by traffic of breeding birds: evaluation of the effect and considerations in planning and managing road corridors. *Biodiversity and Conservation* **6**: 567-581.

<sup>40</sup> Lord, A., Waas, J.R. & Innes, J. (1997) Effects of human activity on the behaviour of northern New Zealand dotterel *Charadrius obscurus aquilonius* chicks. *Biological Conservation* **82**:15-20.

<sup>41</sup> Banks, P.B. & Bryant, J.V. (2007) Four-legged friend of foe? Dog-walking displaces native birds from natural areas. *Biology Letters* **3**: 611-613.

<sup>42</sup> Kirby, J.S., Clee, C. & Seager, V. (1993) Impact and extent of recreational disturbance to wader roosts on the Dee estuary: some preliminary results. *Wader Study Group Bulletin* **68**: 53-58.

<sup>43</sup> Delaney, D.K., Grubb, T.G., Beier, P., Pater, L.L.M. & Reiser, H. (1999) Effects of Helicopter Noise on Mexican Spotted Owls. *The Journal of Wildlife Management* **63**: 60-76.

<sup>44</sup> Beale, C.M. & Monaghan, P. (2005) Modeling the Effects of Limiting the Number of Visitors on Failure Rates of Seabird Nests. *Conservation Biology* **19**: 2015-2019.

<sup>45</sup> Robinson, J.A. & Pollitt, M.S. (2002) Sources and extent of human disturbance to waterbirds in the UK: an analysis of Wetland Bird Survey data, 1995/96 to 1998/99: Less than 32% of counters record disturbance at their site, with differences in causes between coastal and inland sites. *Bird Study* **49**: 205.

- 3.20 As part of the Bird Aware Project in the Solent, a study monitoring bird disturbance across 20 different locations was undertaken between December 2009 and February 2010<sup>46</sup>. This involved recording all recreational activities and relating these to behavioural responses of birds in pre-defined focal areas of intertidal habitat. The study recorded a total of 2,507 potential disturbance events, generating 4,064 species-specific behaviours. Roughly 20% of recorded events resulted in disturbance to waterfowl, including behaviours such as becoming alert, walking / swimming away, short flights (< 50m) or major flights. Generally, the likelihood of disturbance decreased with increasing distance to the disturbance stimulus (i.e. the recreational activity being undertaken). Importantly, the study also illustrated that recreational activities in the intertidal zone have the highest disturbance potential (41% of recorded events resulted in disturbance), followed by water-based activities (25%) and shore-based activities (12%).
- 3.21 The specific distance at which a species takes flight when disturbed is known as the 'tolerance distance' (also called the 'escape distance') and greatly differs between species. The tolerance distances of the study carried out for the Bird Aware project are summarised in Table 4. It is reasonable to assume from this evidence that disturbance is unlikely to be relevant at distances of beyond 300m. The data show that disturbance sensitivity differs between species, but that intra-specific variation is equally important. It was also examined how disturbance to different recreational activities varies between species, but for most species the number of recorded events was insufficient for comparison (except for brent goose, oystercatcher and redshank). Again, there may be inter-specific differences in responses to different types of recreation. For example, brent geese responded to dog walkers much further away than oystercatchers and redshanks.

**Table 4. Tolerance distances in metres of 16 species of waterfowl to various forms of recreational disturbance. The distances are provided both as a median and a range.**

Species	Tolerance distance (metres from stimulus)		Activity			
	Median	Range	Cycling	Dog walking	Jogging	Walking
Brent goose	51.5	5 - 178	100	95	30	50
Oystercatcher	46	10 - 200	150	45	-	50
Redshank	44.5	75 - 150	125	50	40	58
Curlew	75	25 - 200				
Turnstone	50	5 - 100				
Coot	12	10 - 20				
Mute swan	12	8 - 50				
Grey plover	75	30 - 125				
Little egret	75	30 - 200				
Wigeon	75.5	20 - 125				
Dunlin	75	25 - 300				
Shelduck	77.5	50 - 140				
Great-crested grebe	100	50 - 100				
Lapwing	75	18 - 125				
Teal	60	35 - 200				
Mallard	25	10 - 50				

Source: Liley D., Stillman R. & Fearnley H. 2011. *The Solent Disturbance and Mitigation Project Phase 2: Results of Bird Disturbance Fieldwork 2009/10. Report by Footprint Ecology for the Solent Forum.*

- 3.22 A recent study of these SPAs/ Ramsars ranked all sites according to their vulnerability to recreation, finding that the Mersey Narrows & North Wirral Foreshore SPA/ Ramsar is the most sensitive<sup>47</sup>. This was attributed to a number of factors, including easy access onto the foreshore, a high proportion of sand in the sediment

<sup>46</sup> Liley D., Stillman R. & Fearnley H. 2011. *The Solent Disturbance and Mitigation Project Phase 2: Results of Bird Disturbance Fieldwork 2009/10. Report by Footprint Ecology for the Solent Forum.*

<sup>47</sup> Ross K., Liley D., Austin G., Burton N., Stillman R., Cruickshanks K. & Underhill-Day J. (2014). *Housing development and estuaries in England: Developing methodologies for assessing the impacts of disturbance to non-breeding waterfowl.* Unpublished report for Natural England. 164pp.

(encouraging access) and a large number of high-capacity car parks. Dog walking has been highlighted as a significant issue in many of the north-western SPAs/ Ramsars, leading to vigilance behaviours and displacement of wildfowl and waders.

- 3.23 In response to the growing issue of recreation along the north-western coast (particularly when considering future housing growth in the wider LCRCA area), Natural England commissioned bird disturbance assessments and visitor surveys in selected sites of conservation importance. These studies were to focus on the most sensitive locations, survey multiple access locations and yield standardised data. The data from the surveys, which was collected by Footprint Ecology in the winter of 2016/17<sup>48</sup>, is relevant to the LCRCA area and will be consulted in this Screening Report.

## Breeding birds (April to September)

- 3.24 In addition to their overwintering bird assemblages, the Mersey Narrows & North Wirral Foreshore SPA / Ramsar (common tern), Dee Estuary SPA/ Ramsar (common tern, little tern), Ribble & Alt Estuaries SPA / Ramsar (ruff, lesser black-backed gull and common tern), Liverpool Bay/ Bae Lerwpl SPA (little tern and common tern) and Martin Mere SPA/ RAMSAR (greylag goose, gadwall, mallard and snipe) are also designated for breeding birds. These species breed in the summer months, meaning that the recreational pressure impact pathway in the north-western SPAs / Ramsars is not limited to the overwintering period. Terns in particular are sensitive to recreational users (especially from off-lead dogs), because they are ground-nesting species that form their nest as a shallow scrape on bare ground. This makes them very susceptible to egg predation, trampling damage, egg theft and vandalism. Disturbance from dog walkers is a particular threat to ground-nesting birds, which tend to have lower disturbance tolerances because their nests are at higher risk from predators<sup>49</sup>.
- 3.25 Disturbance to birds during the pre-incubation, incubation and chick provisioning stages may lead to the abandonment of potential nesting sites, eggs or chicks, resulting in failure to reproduce or in reduced calorific intake by chicks. If disturbance is pervasive, the failure to produce viable offspring may result in reduced fitness at the population level.
- 3.26 This is supported in the literature. For example, a study assessing the breeding success of little tern and least tern found that nest success was significantly higher (82%) in artificial habitats than on natural sandy beaches (58%)<sup>50</sup>. This was primarily due to recreational disturbance on the beaches (which was absent in artificial habitats). Furthermore, even in successful nests, the number of unhatched eggs was twice as high in the natural habitat, most likely due to disturbance leading to the cooling of eggs.
- 3.27 Many qualifying bird species breed in colonies and the likelihood of disturbance to breeding birds depends on the accessibility of the wider nesting areas to the public. For example, in the Ribble & Alt Estuaries SPA / Ramsar, common terns breed within the Ribble Estuary National Nature Reserve and on sandy foreshores in the Alt Estuary. Lesser black-backed gulls have two known main breeding areas at Banks and Hesketh Marshes, which are both managed by the RSPB. In contrast, the breeding locations of ruff are unknown, but it is thought that this species preferentially breeds in lowland hay meadows subject to grazing regimes, particularly in the Ribble Estuary.
- 3.28 Both common and little terns forage within the shallow coastal waters of the Liverpool Bay SPA amidst recreational boats, ships and personal watercraft. The Liverpool Bay was designated as an SPA due to its essential function in supporting foraging seabirds. A significant increase in water-based recreation (jet-skiing, sailing, kayaking) has the potential to affect the ability of the site to fulfil this supporting role.

## Trampling damage, nutrient enrichment and wildfires

### Trampling damage

- 3.29 Most terrestrial habitats (especially dune systems, heathland and woodland) can be affected by trampling and other mechanical damage, which in turn dislodges individual plants, leads to soil compaction and erosion. This is relevant to the Sefton Coast SAC which is coincident with the Ribble & Alt Estuaries

<sup>48</sup> Liley D., Panter C., Marsh P. & Roberts J. (2017). Recreational activity and interactions with birds within the SSSIs on the North-West coast of England.

<sup>49</sup> For a review of disturbance in relation to terns see: Liley D. (2008). Little terns at Great Yarmouth. Disturbance to birds and implications for strategic planning and development control. Unpublished report by Footprint Ecology for Great Yarmouth Borough Council and the RSPB. 14pp

<sup>50</sup> Pakanen V-M., Hongell H., Aikio S. & Koivula K. (2014). Little tern breeding success in artificial and natural habitats: Modelling population growth under uncertain vital rates. *Population Ecology* **56**: 581-591.

SPA/Ramsar site in Sefton, the Dee Estuary SAC, Alyn Valley Wood/ Coedwigoedd Dyffryn Alun SAC and River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC. The following studies have assessed the impact of trampling associated with different recreational activities in different habitats:

- Wilson & Seney<sup>51</sup> examined the degree of track erosion caused by hikers, motorcycles, horses and cyclists from 108 plots along tracks in the Gallatin National Forest, Montana. Although the results proved difficult to interpret, it was concluded that horses and hikers disturbed more sediment on wet tracks, and therefore caused more erosion, than motorcycles and bicycles.
  - Cole et al<sup>52</sup> conducted experimental off-track trampling in 18 closed forest, dwarf scrub and meadow & grassland communities (each trampled between 0 – 500 times) over five mountain regions in the US. Vegetation cover was assessed two weeks and one year after trampling, and an inverse relationship with trampling intensity was discovered, although this relationship was weaker after one year than two weeks indicating some recovery of the vegetation. Differences in plant morphological characteristics were found to explain more variation in response between different vegetation types than soil and topographic factors. Low-growing, mat-forming grasses regained their cover best after two weeks and were considered most resistant to trampling, while tall forbs (non-woody vascular plants other than grasses, sedges, rushes and ferns) were considered least resistant. The cover of hemicryptophytes and geophytes (plants with buds below the soil surface) was heavily reduced after two weeks but had recovered well after one year and as such these were considered most resilient to trampling. Chamaephytes (plants with buds above the soil surface) were least resilient to trampling. It was concluded that these would be the least tolerant of a regular cycle of disturbance.
  - Cole<sup>53</sup> conducted a follow-up study (in 4 vegetation types) in which shoe type (trainers or walking boots) and trampling weight were varied. Although immediate damage was greater with walking boots, there was no significant difference after one year. Heavier trampers caused a greater reduction in vegetation height than lighter trampers, but there was no difference in the effect on cover.
  - Cole & Spildie<sup>54</sup> experimentally compared the effects of off-track trampling by hiker and horse (at two intensities – 25 and 150 passes) in two woodland vegetation types (one with an erect forb understorey and one with a low shrub understorey). Horse trampling was found to cause the largest reduction in vegetation cover. The forb-dominated vegetation suffered greatest disturbance but recovered rapidly. Generally, it was shown that higher trampling intensities caused more disturbance.
- 3.30 Sand dunes are dynamic systems that are shaped by factors such as the supply of sand and prevailing wind direction. 80% of dunes in the UK are currently subject to coastal erosion, diminishing the dune itself and creating bare ground. Natural England's Access and Nature Conservation Reconciliation guidance note states that light levels of trampling can increase plant diversity, but medium to high levels of trampling promote bare ground, increase soil compaction, reduce plant diversity and change vegetation height. The type of dune habitat also influences its response to recreational pressure. For example, in fixed decalcified dunes the relationship between levels of access and impact is linear (i.e. proportionate relationship). In other dune types (e.g. embryonic shifting dunes), the relationship is curvilinear, suggesting that a small increase in trampling has a disproportionately strong effect, with a flattening of the impact curve at higher trampling damage<sup>55</sup>.

## Nutrient enrichment

- 3.31 A major concern for nutrient-poor terrestrial habitats such as dune systems is nutrient enrichment associated with dog fouling, which has been addressed in various reviews (e.g.<sup>56</sup>). It is estimated that dogs will defecate within 10 minutes of starting a walk and therefore most nutrient enrichment arising from dog faeces will

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<sup>51</sup> Wilson, J.P. & J.P. Seney. 1994. Erosional impact of hikers, horses, motorcycles and off-road bicycles on mountain trails in Montana. *Mountain Research and Development* **14**:77-88

<sup>52</sup> Cole, D.N. 1995a. Experimental trampling of vegetation. I. Relationship between trampling intensity and vegetation response. *Journal of Applied Ecology* **32**: 203-214

Cole, D.N. 1995b. Experimental trampling of vegetation. II. Predictors of resistance and resilience. *Journal of Applied Ecology* **32**: 215-224

<sup>53</sup> Cole, D.N. 1995c. Recreational trampling experiments: effects of trampler weight and shoe type. Research Note INT-RN-425. U.S. Forest Service, Intermountain Research Station, Utah.

<sup>54</sup> Cole, D.N., Spildie, D.R. 1998. Hiker, horse and llama trampling effects on native vegetation in Montana, USA. *Journal of Environmental Management* **53**: 61-71

<sup>55</sup> Coombes E.G. (2007). The effects of climate change on coastal recreation and biodiversity. School of Environmental Sciences. University of East Anglia, Norwich.

<sup>56</sup> Taylor K., Anderson P., Taylor R.P., Longden K. & Fisher P. 2005. Dogs, access and nature conservation. English Nature Research Report, Peterborough.

occur within 400m of a site entrance. In contrast, dogs will urinate at frequent intervals during a walk, resulting in a spread-out distribution of urine. For example, in Burnham Beeches National Nature Reserve it is estimated that 30,000 litres of urine and 60 tonnes of dog faeces are deposited annually<sup>57</sup>. While there is little information on the chemical constituents of dog faeces, nitrogen is one of the main components<sup>58</sup>. Nutrient levels are the major determinant of plant community composition and the effect of dog defecation in sensitive habitats is comparable to a high-level application of fertiliser, potentially resulting in the shift to plant communities that are more typical of improved grasslands.

## Wildfires/ arson

- 3.32 Wildfires are a periodic threat across the European sites and can adversely affect habitats through direct damage caused to the vegetation and soils, which results in loss of valuable habitat quality and associated wildlife alongside carbon release to atmosphere and to watercourses. Wildfires/ arson has been Identified as a potential threat to both the Dee Estuary SAC and the Sefton Coast SAC (refer to **Table 2**).
- 3.33 The cause of ignition is generally accepted to be of human origin, with deliberate intent a pattern on some parts of the site and elsewhere careless behaviour near to footpaths and car parks appear to be the chief cause of ignition. Available research<sup>59, 60</sup> identifies the principle causes of 'wild' fires to be: deliberate fire-setting; camp fires that have got out of control; planned fires that have got out of control (e.g. part of moorland management for grouse); and bonfires that have got out of control.
- 3.34 Kirby & Tantram concluded that fires occurred at higher densities on the fringes of larger conurbations and in sites within developed urban areas, where fire events present a serious risk to ecological integrity. Within the Kirby & Tantram research a zone of 500m was used, based on the maximum likely access distance for average users of greenspace<sup>61, 62</sup>, and it was found that the degree of development within this zone correlated with incidence of fires (on Dorset Heathlands). There is also evidence to suggest that a significant proportion of deliberate fire setting is by children of school age.

## Conclusion

- 3.35 The available baseline information suggests that the following European sites located within or within 7km of the LCRCA boundary are sensitive to recreational pressure due to the presence of waterfowl, waders and seabirds at different times throughout the year and sensitive habitats (the sites in bold are taken forward into the following chapters):
- **Mersey Estuary SPA/ Ramsar**
  - **Mersey Narrows and North Wirral Foreshore SPA/ Ramsar**
  - **Dee Estuary SPA/ Ramsar**
  - **Dee Estuary SAC**
  - **Sefton Coast SAC**
  - **Ribble and Alt Estuaries SPA/ Ramsar**
  - **Liverpool Bay/ Bae Lerwpl SPA**
  - **Martin Mere SPA/ Ramsar**
- 3.36 Whilst raised bog is sensitive to trampling it should be noted that the main threats to threats to bogs are afforestation, peat cutting for horticulture, drainage for agriculture, overgrazing and fires as opposed to recreational use given the waterlogged nature of the habitat. Manchester Mosses SAC have therefore been **screened out** from this impact pathway. Oak Mere SAC and Deeside and Buckley Newt Sites SAC have also been **screened out** from this impact pathway due to the waterlogged nature of the sites.

<sup>57</sup> Barnard A. 2003. Getting the facts – Dog walking and visitor number surveys at Burnham Beeches and their implications for the management process. *Countryside Recreation* 11:16-19.

<sup>58</sup> Taylor K., Anderson P., Liley D. & Underhill-Day J.C. 2006. Promoting positive access management to sites of nature conservation value: A guide to good practice. English Nature / Countryside Agency, Peterborough and Cheltenham.

<sup>59</sup> J. C. Underhill-Day, (2005) 'A literature review of urban effects on lowland heaths and their wildlife', English Nature Research Reports, Number 623

<sup>60</sup> J.S. Kirby & D.A.S Tantram (1999) 'Monitoring heathland fires in Dorset: Phase 1' Report to Department of the Environment, Transport and the Regions: Wildlife and Countryside Directorate

<sup>61</sup> arrison, C, Burgess, J, Millward, A, Dawe, G. 1995. Accessible greenspace in towns and cities: A review of appropriate size and distance criteria. English Nature Research Report No. 153. English Nature, Peterborough.

<sup>62</sup> Box, J. & Harrison, C. 1993. Natural spaces in urban places. *Town* 19 Country Planning, 62(9): 231-235

- 3.37 Halkyn Mountain/ Mynydd Helygain SAC (c.5.5km from the LCRCA boundary), Alyn Valley Wood/ Coedwigoedd Dyffryn Alun SAC (c. 12km from the LCRCA boundary) and the River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC (c. 12.5km from the LCRCA boundary )are unlikely to experience a significant increase in visitor numbers as a result of growth within the LCRCA area as studies have shown that the majority of visitors to European sites live 'close to home' and more favoured habitat types i.e., beaches, sand-dunes and estuaries more accessible to LCRCA residents. Halkyn Mountain/ Mynydd Helygain SAC, Alyn Valley Wood/ Coedwigoedd Dyffryn Alun SAC and River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC have therefore been **screened out** from this impact pathway.
- 3.38 The River Eden SAC is over 90km away from the LCRCA boundary and implementation of the SDS will have no effect on the features of interest as a result of recreational pressures and disturbance. The River Eden SAC has therefore been **screened out** from this impact pathway.

## Background to Atmospheric Pollution

- 3.39 Increased residential and employment development would lead to a greater number of vehicles within the LCRCA area. An expansion of Liverpool John Lennon Airport or the Ports of Liverpool and Garston could also result in an increase in aircraft and shipping emissions. Some industrial processes can also result in stack emissions. As such, increased air pollution could arise relative to a situation of no growth.
- 3.40 The main pollutants of concern for European sites are oxides of nitrogen (NO<sub>x</sub>), ammonia (NH<sub>3</sub>) and sulphur dioxide (SO<sub>2</sub>) and are summarised in Table 5.

**Table 5. Main sources and effects of air pollutants on habitats and species**

Pollutant	Source	Effects on habitats and species
Sulphur dioxide (SO <sub>2</sub> )	<p>The main sources of SO<sub>2</sub> are electricity generation, and industrial and domestic fuel combustion. However, total SO<sub>2</sub> emissions in the UK have decreased substantially since the 1980's.</p> <p>Another origin of sulphur dioxide is the shipping industry and high atmospheric concentrations of SO<sub>2</sub> have been documented in busy ports. In future years shipping is likely to become one of the most important contributors to SO<sub>2</sub> emissions in the UK.</p>	<p>Wet and dry deposition of SO<sub>2</sub> acidifies soils and freshwater and may alter the composition of plant and animal communities.</p> <p>The magnitude of effects depends on levels of deposition, the buffering capacity of soils and the sensitivity of impacted species.</p> <p>However, SO<sub>2</sub> 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.</p>
Acid deposition	<p>Leads to acidification of soils and freshwater via atmospheric deposition of SO<sub>2</sub>, NO<sub>x</sub>, 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.</p> <p>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.</p>	<p>Gaseous precursors (e.g. SO<sub>2</sub>) can cause direct damage to sensitive vegetation, such as lichen, upon deposition.</p> <p>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.</p> <p>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</p>

Pollutant	Source	Effects on habitats and species
		quartz rich rocks tend to be more susceptible.
Ammonia (NH <sub>3</sub> )	<p>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.</p> <p>Ammonia reacts with acid pollutants such as the products of SO<sub>2</sub> and NO<sub>x</sub> emissions to produce fine ammonium (NH<sub>4</sub><sup>+</sup>) - containing aerosol. Due to its significantly longer lifetime, NH<sub>4</sub><sup>+</sup> may be transferred much longer distances (and can therefore be a significant trans-boundary issue).</p> <p>While ammonia deposition may be estimated from its atmospheric concentration, the deposition rates are strongly influenced by meteorology and ecosystem type</p>	<p>The negative effect of NH<sub>4</sub><sup>+</sup> may occur via direct toxicity when uptake exceeds detoxification capacity and via N accumulation.</p> <p>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.</p> <p>As emissions mostly occur at ground level in the rural environment and NH<sub>3</sub> is rapidly deposited, some of the most acute problems of NH<sub>3</sub> deposition are for small relict nature reserves located in intensive agricultural landscapes.</p>
Nitrogen oxides (NO <sub>x</sub> )	<p>Nitrogen oxides are mostly produced in combustion processes. Half of NO<sub>x</sub> emissions in the UK derive from motor vehicles, one quarter from power stations and the rest from other industrial and domestic combustion processes.</p> <p>In contrast to the steep decline in Sulphur dioxide emissions, nitrogen oxides are falling slowly due to control strategies being offset by increasing numbers of vehicles.</p>	<p>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 NO<sub>x</sub> for all vegetation types has been set to 30 ug/m<sup>3</sup>.</p> <p>Deposition of nitrogen compounds (nitrates (NO<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>) and nitric acid (HNO<sub>3</sub>)) contributes to the total nitrogen deposition and may lead to both soil and freshwater acidification.</p> <p>In addition, NO<sub>x</sub> contributes to the eutrophication of soils and water, altering the species composition of plant communities at the expense of sensitive species.</p>
Nitrogen deposition	<p>The pollutants that contribute to the total nitrogen deposition derive mainly from oxidized (e.g. NO<sub>x</sub>) or reduced (e.g. NH<sub>3</sub>) nitrogen emissions (described separately above). While oxidized nitrogen mainly originates from major conurbations or highways, reduced nitrogen mostly derives from farming practices.</p> <p>The N pollutants together are a large contributor to acidification (see above).</p>	<p>All plants require nitrogen compounds to grow, but too much overall N is regarded as the major driver of biodiversity change globally.</p> <p>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.</p> <p>N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.</p>
Ozone (O <sub>3</sub> )	A secondary pollutant generated by photochemical reactions involving NO <sub>x</sub> , volatile organic compounds (VOCs) and sunlight. These	Concentrations of O <sub>3</sub> above 40 ppb can be toxic to both humans and wildlife and can affect buildings.

Pollutant	Source	Effects on habitats and species
	<p>precursors are mainly released by the combustion of fossil fuels (as discussed above).</p> <p>Increasing anthropogenic emissions of ozone precursors in the UK have led to an increased number of days when ozone levels rise above 40 ppb ('episodes' or 'smog'). Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.</p>	<p>High O<sub>3</sub> 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.</p>

Source: Air Pollution Information System ([www.apis.ac.uk](http://www.apis.ac.uk))

- 3.41 Ammonia can have a directly toxic effect upon vegetation, particularly at close distances to the source such as near road verges<sup>63</sup>. NOx can also be toxic at high concentrations (far above the annual average critical level). High levels of NOx and NH<sub>3</sub> are likely to increase the total N deposition to soils, potentially leading to deleterious knock-on effects in resident ecosystems. Increases in nitrogen deposition from the atmosphere can, if sufficiently great, enhance soil fertility and lead to eutrophication. This often has adverse effects on community composition and the quality of semi-natural, nitrogen-limited terrestrial and aquatic habitats<sup>64 65</sup>.
- 3.42 Sulphur dioxide emissions overwhelmingly derive from power stations and industrial processes that require the combustion of coal and oil, as well as (particularly on a local scale) shipping<sup>66</sup>.
- 3.43 Sulphur deposition is known to be a problem for the Sefton coast, originating from shipping exhaust emissions related to the Port of Liverpool. According to the UK Air Pollution Information System ([www.apis.ac.uk](http://www.apis.ac.uk)) this is mainly with regard to the dune grassland interest feature. APIS (accessed 29/07/2021) indicates that 53% of sulphur deposition within the SAC is due to shipping and 'other transport' (the latter category excludes road transport but does include air travel). The most recent National Vegetation Classification (NVC) assessment of the Sefton coast (Sefton Coast Partnership, 2003-04) has also found that vegetation communities are becoming more eutrophic across the SAC as a result of nitrogen deposition, with shipping activities considered to be contributing to levels of deposition. The potential for effects from port expansion projects will therefore require discussion as the Seaforth Nature Reserve will bring shipping up to the boundary of the SAC.
- 3.44 Ammonia emissions primarily originate from agricultural practices<sup>67</sup>, with some chemical processes also making notable contributions. As such, it is unlikely that material increases NH<sub>3</sub> emissions will be associated with the LCRCA SDS.
- 3.45 NOx emissions, however, 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 the associated road traffic. Other sources, although relevant, are of minor importance (8%) in comparison<sup>68</sup>. Emissions of NOx could therefore be reasonably expected to increase as a result of the additional commuter traffic associated with the LCRCA SDS.
- 3.46 According to the World Health Organisation, the critical NOx concentration (critical threshold) for the protection of vegetation is 30 µgm<sup>-3</sup>; the threshold for sulphur dioxide is 20 µgm<sup>-3</sup>. In addition, ecological

<sup>63</sup> [http://www.apis.ac.uk/overview/pollutants/overview\\_NOx.htm](http://www.apis.ac.uk/overview/pollutants/overview_NOx.htm).

<sup>64</sup> 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

<sup>65</sup> 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

<sup>66</sup> [http://www.apis.ac.uk/overview/pollutants/overview\\_SO2.htm](http://www.apis.ac.uk/overview/pollutants/overview_SO2.htm).

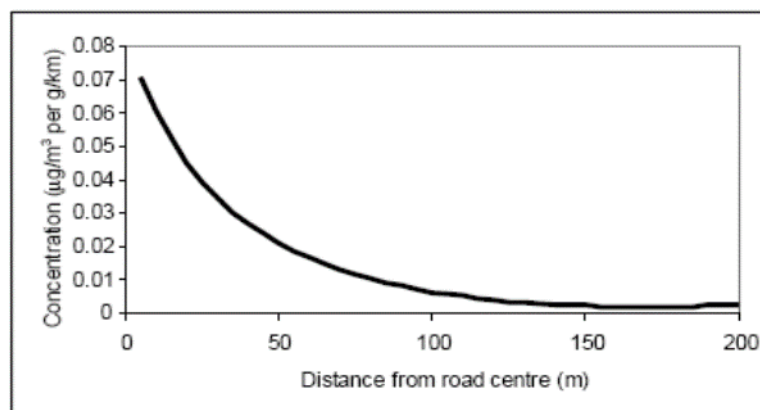
<sup>67</sup> Pain, B.F.; Weerden, T.J.; Chambers, B.J.; Phillips, V.R.; Jarvis, S.C. 1998. A new inventory for ammonia emissions from U.K. agriculture. *Atmospheric Environment* 32: 309-313

<sup>68</sup> 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>



studies have determined 'critical loads'<sup>69</sup> of atmospheric nitrogen deposition (that is, NO<sub>x</sub> combined with ammonia NH<sub>3</sub>).

- 3.47 According to the Department for Transport's Transport Analysis Guidance, beyond 200m, the contribution of vehicle emissions from the roadside to local pollution levels is not significant<sup>70</sup>.



**Figure 1: Traffic contribution to concentrations of pollutants at different distances from a road**  
(Source: [www.dft.gov.uk/ha/standards/dmrb/vol11/section3/ha20707.pdf](http://www.dft.gov.uk/ha/standards/dmrb/vol11/section3/ha20707.pdf))

- 3.48 Atmospheric nitrogen deposition from vehicle exhaust emissions has the potential to affect a variety of habitats, particularly nutrient-poor habitats such as dune systems. Both the Sefton Coast SAC and the Dee Estuary SAC lie within the LCRCA boundary and are designated for dune features (the most sensitive of which are fixed coastal dunes with herbaceous vegetation). Furthermore, breeding terns (qualifying species of the Dee Estuary SPA/ Ramsar, Ribble & Alt Estuaries SPA / Ramsar and the Mersey Narrows & North Wirral Foreshore SPA / Ramsar) rely on bare ground to build their scrapes. A significant increase in nitrogen deposition has the potential to increase the abundance of graminoids, obstructing the ability of terns to successfully breed. An increase in the population and employment sector in the LCRCA area could result in increased commuter traffic flowing past these sites, depending on their locations in relation to major roads and other authorities.
- 3.49 Regarding air quality impacts from traffic, the extent to which this can be explored in detail at the SDS level will depend upon the availability of traffic and air quality modelling for the intended growth scenario(s). In turn this will depend upon the level of detail available to the traffic modellers concerning the distribution of growth, noting that the SDS will be identifying broad growth areas but not making site allocations (except to acknowledge sites already allocated in existing Local Plans). To undertake detailed air quality modelling for growth scenarios it would be necessary to have, from the traffic modellers:
- 24hr Annual Average Daily Traffic, average vehicle speeds and percentage heavy duty vehicles for each growth scenario for each of the following:
  - Baseline
  - Do Minimum (i.e. end of plan period without the SDS but including growth from other sources including surrounding local authorities)
  - Do Something (i.e. end of plan period with the SDS and growth from other sources including surrounding local authorities)
- 3.50 This would be required for every significant road within 200m of relevant European sites i.e. A565 Liverpool Road past the Dee Estuary SAC, Coastal Road and Marine Drive running adjacent to the Sefton Coast SAC and the M62 past Manchester Mosses SAC. If these data are not available then there is no way that the air quality impact of growth can be modelled. It is unknown at this stage whether that level of detail will be available, although it appears to be unlikely.
- 3.51 Therefore, the Appropriate Assessment, which is the next stage of the HRA process, will need to undertake a high-level assessment of potential air quality issues, identifying a strong sustainable travel framework for

<sup>69</sup> The critical load is the rate of deposition beyond which research indicates that adverse effects can reasonably be expected to occur

<sup>70</sup> <http://www.dft.gov.uk/webtag/documents/expert/unit3.3.3.php#013>; accessed 12/05/2016

the SDS and the possible need for further multi-authority strategic mitigation to be developed. Individual Local Plans would then undertake more detailed assessments along the lines discussed above in their Local Plan HRAs. However, the HRA of the SDS could seek to define the recommended parameters of that 'down-the-line' assessment for Local Plans, taking care to ensure that anything identified at the SDS level can be taken on board in Local Plans and their HRAs. It would be advisable for the LCR constituent authorities to collaborate on a transport model to inform each Local Plan, to avoid a proliferation of traffic models examining impacts on the same European sites.

- 3.52 For the purposes of the SDS Appropriate Assessment it will be possible to identify the very broad areas that may be most likely to have air quality impacts on those European sites of greatest sensitivity to traffic related air quality (specifically Sefton Coast SAC, Dee Estuary SAC and Manchester Mosses SAC) as Strategic Sites which are to be the focal areas for growth have been identified in the SDS.

## Conclusion

- 3.53 The following European sites within 15km of the LCRCA boundary are sensitive to atmospheric pollution (sites in bold are taken forward into the following chapters):
- **Sefton Coast SAC** (adjacent to the Coastal Road and Marine Road)
  - **Dee Estuary SAC** (adjacent to the A565)
  - **Dee Estuary SPA/ Ramsar** (adjacent to the A565)
  - **Manchester Mosses SAC** (section immediately adjacent to the M62)
  - **Halkyn Mountain/ Mynydd Helygain SAC** (section immediately adjacent to the A55)
  - **Deeside and Buckley Newt Sites SAC** (section immediately adjacent to the A55)
  - **Oak Mere SAC** (immediately adjacent to the A54)
- 3.54 Martin Mere SPA/ Ramsar is a freshwater site that is primarily phosphate- rather than nitrogen-limited, meaning that phosphate is the primary fuel for plant growth. Agricultural land is important for the bird populations but has no critical load and is generally high in nitrogen and phosphorus. Phosphate does not derive from vehicle exhaust emissions and as such the SPA /Ramsar is excluded from further assessment. APIS highlights that none of the habitats of its qualifying species within this site are sensitive to atmospheric nitrogen deposition (saltmarsh is the only habitat associated with the species present in the SPA in which nitrogen deposition could result in effects on the bird population but there is no saltmarsh within the SPA/Ramsar site). Martin Mere SPA/ Ramsar has therefore been **screened out** from this impact pathway.
- 3.55 The River Dee and Bala Lake, Afon Dyfrdwy a Llyn Tegid SAC and the River Eden SAC have also been **screened out** as they are freshwater systems and do not lie within 200m of any main commuting route from the LCRCA area.
- 3.56 Being a marine site, the Liverpool Bay/ Bae Lerwpl SPA/ Ramsar, while potentially sensitive to atmospheric nitrogen deposition, lies far away from any major road. Liverpool Bay SPA/ Ramsar has therefore been **screened out** from this impact pathway.
- 3.57 Ribble and Alt Estuaries SPA/ Ramsar, Mersey Narrows & North Wirral Foreshore SPA/ Ramsar and Alyn Valley Woods/ Coedwigoedd Dyffryn Alun SAC are all greater than 200m from a main road. On the basis of the Department of Transport's Transport Analysis Guidance, these sites have been **screened out** from this impact pathway.

## Background to Loss of Functionally Linked Habitat (FLH)

- 3.58 While most European 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, bats and amphibians are not always confined to the boundary of designated sites.
- 3.59 For example, the highly mobile nature of both wader and waterfowl species implies that areas of habitat of crucial importance to the integrity of their populations lie outside the physical limits of the European site for

which they are an interest feature. However, this area will still be essential for maintenance of the structure and function of the interest feature for which the site was designated and land use plans that may affect this land should still therefore be subject to further assessment. This has been underlined by a recent European Court of Justice ruling (C-461/17, known as the Holohan ruling<sup>71</sup>) which in paragraphs 37 to 40 confirms the need for an appropriate to consider the implications of a plan or project on habitats and species outside the European site boundary provided that those implications are liable to affect the conservation objectives of the site.

- 3.60 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<sup>72</sup>. 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 would have been potentially affected by development while on functionally linked habitat, 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.
- 3.61 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 records centres) to be firmly established. In many instances (with the Solent Waders and Brent Goose Strategy being a notable exception), data may not be available at all, requiring further survey work.
- 3.62 Several European sites that are designated for mobile waterfowl and waders lie within the LCRCA boundary. Therefore, it is possible that the allocation of greenfield sites (i.e., parcels of land without any existing development) would result in the loss of functionally linked habitat. The primary concern would be the loss of greenfield sites in the more rural areas of the LCRCA area as many SPA / Ramsar birds (particularly golden plover, geese and swans) forage in agricultural stubble in winter.
- 3.63 A study carried out by TEP in 2015<sup>73</sup> identified that features such as the docks within Liverpool are used by bird features associated with European sites. Similarly, the study by Avian Ecology<sup>74</sup> identified functionally linked habitat within the Halton District around the River Mersey.
- 3.64 It is well established that there is likely to be movement of qualifying birds between all SPAs/ Ramsars along the north-western coastline. Therefore, an assessment of LSEs and potential adverse effects (including mitigation) will also ensure that the integrity of the European sites in the wider coastal network is protected.
- 3.65 Natural England Impact Risk Zones for each SSSI and guidance that underlies those zones will be utilised. The main document of reference is:
- Natural England (2019). Impact Risk Zones Guidance Summary Sites of Special Scientific Interest Notified for Birds. Version 1.1
- 3.66 This identifies the typical distances that wintering waterfowl will travel from their SPAs to forage. Relevant Impact Risk Zones are shown in Table 6:

**Table 6. Natural England Impact Risk Zones for Designated Bird Features**

Assemblage	Impact Risk Zone (foraging distance)
Wintering birds (except wintering waders and grazing wildfowl; wigeon and geese)	Up to 500m

<sup>71</sup> The Holohan ruling also requires all the interest features of the European sites discussed to be catalogued (i.e., listed) in the HRA. That is the purpose of Appendix A.

<sup>72</sup> 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

<sup>73</sup> Assessment of Supporting Habitat (Docks) for Use by Qualifying Features of Natura 2000 Sites in the Liverpool City Region, Ornithology Report, TEP Version 3.0, Ref 4157 005. August 2015

<sup>74</sup> Halton HRA Bird Surveys on behalf of Halton Borough Council: Non-Breeding Bird Surveys – Interim Report 1 September – mid-November 2018. Avian Ecology

Assemblage	Impact Risk Zone (foraging distance)
Dabbling ducks such as teal, mallard and gadwall	Home ranges could extend beyond site boundaries at coastal sites, but less likely to do so at inland water bodies.
Wintering waders (except golden plover and lapwing), brent goose & wigeon	Maximum foraging distance is 2km
Wintering lapwing and golden plover	<p>Maximum foraging distance is 15-20km.</p> <p>Golden plover can forage up to 15km from a roost site within a protected site. Lapwing can also forage similar distances. Both species use lowland farmland in winter and it is difficult to distinguish between designated populations and those present within the wider environment.</p> <p>Developments affecting functionally linked land more than 10km from the site are unlikely to impact significantly on designated populations.</p>
Wintering white-fronted goose, greylag goose, Bewick's swan, whooper swan, pink-footed goose & wintering bean goose	<p>Maximum foraging distance is 10km although studies have shown that pink-footed geese will fly 20km from their roosting site to feed<sup>75</sup>.</p> <p>A bespoke functional land IRZ has replaced the individual Birds 6/7 IRZs for sites supporting the following goose and swan species: pink-footed geese, barnacle goose, Bewick's swan, white-fronted goose and whooper swan.</p> <p>The IRZ is based on GIS distribution records of feeding pink-footed geese from a study undertaken for Natural England by the Wildfowl &amp; Wetlands Trust<sup>76</sup> and the results of work undertaken by the British Trust for Ornithology to identify functionally connected habitat used by barnacle goose, Bewick's swan, white-fronted goose and whooper swan based on WeBS site and BirdTrack data and focuses on only the areas of land that we know are being used as functional habitat by designated populations</p>

Source: Natural England (2019). *Impact Risk Zones Guidance Summary Sites of Special Scientific Interest Notified for Birds*.  
Version 1.1

- 3.67 The aforementioned Natural England document further identifies that for SSSIs designated for wintering waterfowl and waders (other than golden plover and lapwing) a maximum of 2km is appropriate for the identification of potential functionally-linked land for development with the exception of wind energy (3km) and airports (10km). For the purpose of this HRA, a buffer of 10km will be applied due to the potential for the expansion of John Lennon Airport.
- 3.68 The Sefton Coast SAC is partly designated for great-crested newts, a species that requires different habitat types in its life cycle. Individuals that breed in ponds in the SAC's dune systems are likely to travel beyond the site boundary to forage or over-winter in terrestrial habitats. During the breeding season, their breeding ponds are of primary importance. Conversely, in winter, good-quality terrestrial habitat up to 250m away from the ponds (and potentially beyond the site boundary) is of high value to newts. A wide range of semi-natural habitats might be used for shelter, dispersal and foraging, including meadows, tussocky grassland, scrub, woodland, low-intensity farmland and brownfield sites. Newt dispersal in the terrestrial environment is highly dependent on habitat connectivity and habitat fragmentation must therefore be avoided. Similarly, the natterjack toad population of the Ribble & Alt Estuaries Ramsar site is known to make use of sand dune habitat beyond the SAC boundary, such as the golf courses around Sefton.

## Conclusion

3.69 Overall, the available baseline information suggests that the following European sites are sensitive to the loss of functionally linked habitats due to the presence of mobile waterfowl, waders, great-crested newts or natterjack toad (the sites in bold are taken forward into the following chapters):

- **Mersey Estuary SPA/ Ramsar**
- **Mersey Narrows and North Wirral Foreshore SPA/ Ramsar**
- **Dee Estuary SPA/ Ramsar**
- **Sefton Coast SAC**

<sup>75</sup> <https://monitoring.wwt.org.uk/wp-content/uploads/2018/12/Mapping-feeding-Pinkfeet-in-England-Final-report-vFinal.Jan15-2.pdf> [accessed 14/04/2021]

<sup>76</sup> Ibid

- **Ribble and Alt Estuaries SPA/ Ramsar**
  - **Liverpool Bay/ Bae Lerwpl SPA**
  - **Martin Mere SPA/ Ramsar**
- 3.70 The Dee Estuary/ Aber Dyfrdwy SAC, Manchester Mosses SAC and Oak Mere SAC are all designated for non-mobile qualifying features. These sites have therefore been **screened out** from this impact pathway.
- 3.71 Given the distance away from the LCRCA boundary and the aquatic nature of mobile qualifying features of River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC (Atlantic salmon, brook lamprey, bullhead, floating water-plantain, otter, river lamprey, sea lamprey) and the River Eden SAC (Atlantic salmon, brook lamprey, bullhead, otter, river lamprey, sea lamprey, white-clawed crayfish) it is highly unlikely that these features will be affected by loss of functionally-linked habitat. Although it is feasible for otter to commute 10km, both of these sites are over 10km from the LCRCA boundary. These sites have therefore been **screened out** from this impact pathway.
- 3.72 Halkyn Mountain/ Mynydd Helygain SAC and Deeside and Buckley Newt Sites SAC are designated for their great crested newt populations. Both of these sites are located over 5km from the LCRCA boundary. Great crested newts typically remain within 250m of their breeding ponds where suitable terrestrial habitat exists although can range up to 500m from breeding ponds. These sites are of sufficient distance away to be **screened out** from this impact pathway.
- 3.73 The mobile feature of Alyn Valley Woods/ Coedwigoedd Dyffryn Alun SAC is the lesser horseshoe bat. This species is now restricted to Wales, the West Midlands and south-west England<sup>77</sup>, therefore the LCRCA area is beyond its range. This site can be **screened out** from this impact pathway.

## Background to Water Quality and Resources

### Water quality

- 3.74 The quality of the water that feeds European sites is an important determinant of the nature of their habitats and the species they support. Water quality has been raised as a potential linking impact pathway between the SDS and the coastal waters of the LCR.
- 3.75 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. 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.
- 3.76 Of particular relevance are non-toxic chemicals such as phosphorus and nitrogen. They are essential nutrients for plant growth but in excess can affect the nutrient status of the waterbody and may cause eutrophication (excessive microbial and vegetative growth) if other environmental conditions are suitable, such as sufficiently low suspended sediment load to allow light penetration for growth, sufficiently warm water temperatures to allow rapid growth during the summer and sufficiently low wave action or adequately sheltered conditions to prevent the breakup of smothering algal mats during the winter. In coastal waters nitrogen is generally the primary growth-limiting nutrient.
- 3.77 Nitrogen and phosphorus enter the estuarine environment via point or diffuse sources. Point sources are generally consented discharges and a direct result of human activities including; sewage effluent from treatment works (WWTWs), discharges from some industrial processes (including detergents and fertilizers), agricultural fertiliser and animal waste. Diffuse inputs originate from both natural and anthropogenic sources. These comprise run-off/leaching from the land catchment (either directly into estuaries and coastal waters or via rivers and groundwater), atmospheric deposition, imports from off-shore waters and nitrogen fixation by plant life. Some forms of nitrogen, such as ammonia, are both directly toxic and contribute to eutrophication.

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<sup>77</sup> [www.vwt.org.uk/species/lesser-horseshoe-bat/](http://www.vwt.org.uk/species/lesser-horseshoe-bat/)

- 3.78 Depending on the location of development sites, impacts of surface water runoff from hardstanding on water quality will also require consideration. Water from overflowing sewage systems and from industrial leakages and / or spillages may contribute nutrients or industrial pollutants to these sites.
- 3.79 LCR lies in the sewage catchment served by United Utilities (UU), responsible for the public water supply and wastewater treatment in this part of north-west England. The Sewage Treatment Works (STWs) that serve Liverpool are principally Fazakerley and Sandon Dock. Fazakerley STW discharges treated effluent to the River Alt (or tributaries of that river), which drains to the Sefton Coast SAC and Ribble & Alt Estuaries SPA/Ramsar. Sandon Dock STW discharges into the Mersey immediately upstream of Liverpool Bay SPA and within close proximity to the Mersey Narrows & North Wirral Foreshore SPA and Ramsar site.

## Conclusion

- 3.80 The following European sites are sensitive to a deterioration in water quality (sites in bold are taken forward into the following chapters):
- **Mersey Estuary SPA/ Ramsar**
  - **Mersey Narrows and North Wirral Foreshore SPA/ Ramsar**
  - **Dee Estuary SAC**
  - **Dee Estuary Ramsar SPA/ Ramsar**
  - **Ribble and Alt Estuaries SPA**
  - **Liverpool Bay/ Bae Lerwpl SPA**
- 3.81 The River Eden SAC is c. 90km away therefore issues relating to water quality are not relevant to this site and it can therefore be **screened out** from this impact pathway.
- 3.82 River Dee and Bala Lake, Afon Dyfrdwy a Llyn Tegid SAC is located 12.5km upstream of the LCR area therefore the site can be **screened out** from this impact pathway.
- 3.83 Being a raised bog, Manchester Mosses SAC is precipitation fed and Martin Mere SPA/ Ramsar, although being sensitive to water quality impacts, is an 'off-line' waterbody There are therefore no hydrological connections and these sites can be **screened out** from this impact pathway.
- 3.84 There is no hydrological connection to Halkyn Mountain/ Mynydd Helygain SAC, Deeside and Buckley Newt Sites SAC, Oak Mere SAC or Alyn Valley Woods/ Coedwigoedd Dyffryn Alun SAC therefore issues relating to water quality are not relevant to these sites and they can therefore be **screened out** from this impact pathway.

## Water quantity, level and flow

- 3.85 The water level, its flow rates and the mixing conditions are important determinants of the condition of European sites and their qualifying features. Hydrological processes are critical in influencing habitat characteristics in wetlands and 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 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, and often interact with coastal squeeze.
- 3.86 Coastal habitats rely on hydrological connections with other surface waters, such as rivers, streams and lakes. A constant supply of freshwater is fundamental to maintaining the ecological integrity of coastal marine areas. However, while the natural fluctuation of water levels within narrow limits is desirable, excess or too little water supply might cause the water level to be outside of the required range of qualifying birds, invertebrate or plant species. In extreme cases, this might lead to the loss of the structure and functioning of marine ecosystems. There are two mechanisms through which urban development might negatively affect freshwater supply to European 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 decrease freshwater input to European sites sharing the same catchment.

- The proliferation of impermeable surfaces in urban areas increases the volume and speed of surface water runoff. As traditional drainage systems often cannot cope with the volume of stormwater, sewer overflows are designed to discharge excess water directly into watercourses. This can contribute to so-called flash floods and increased water flow into European sites. Some of the knock-on impacts of surface water runoff include increases in sedimentation, turbidity and anthropogenic pollutants.
- 3.87 Water abstraction for the potable water supply is of particular concern in areas with little rainfall (and limited recharge potential) or where water resources are already depleted. The North West is generally an area of low water stress (see Figure 2), as is North Wales, which is a major source of potable water for north-west England. While this part of England is highly populated, the high annual rainfall appears to be sufficient to replenish groundwater levels over the course of the year.
- 3.88 An initial investigation indicates that West Lancashire lies within United Utilities' Strategic Resource Zone which currently serves approximately 7 million people in south Cumbria, Lancashire, Greater Manchester, Merseyside, most of Cheshire and a small part of Derbyshire. This zone supplies around 1,706 Ml/d of potable water, which includes water imports from Wales, Cumbria, and other parts of north-west England. It constitutes a large integrated supply network that enables substantial flexibility in distributing supplies within the zone with the 'west to east link' further aiding this flexibility. This has broken the traditional division in which Greater Manchester received water from Cumbria and Merseyside received water from the River Dee (which lies partly in England and partly in Wales) and from purely Welsh sources (e.g., Lake Vyrnwy).
- 3.89 In exploring water resource issues relating to Welsh European sites for St Helens Council, we determined from United Utilities that approximately 75% of St. Helens potable water supply is currently abstracted from the River Dee, 20% is abstracted from Lake Vyrnwy and only 5% is abstracted from sites in Cumbria. It is likely that similar proportions relate to Liverpool City although this is likely to change in the future as a result of the greater flexibility provided by the west-east link. In any case, Cumbrian and Welsh sources will still be involved in water supply to the LCR area.
- 3.90 The River Dee SAC flows into the Dee Estuary SAC/ SPA/ Ramsar. Four water companies abstract from sources that affect the River Dee including United Utilities (UU), Dee Valley Water, Welsh Water and Severn Trent Water. Excessive abstraction from the Dee could therefore result in sufficient drawdown of water to damage the interest features of the River Dee and Bala Lake SAC (through desiccation, fish entrainment or a deterioration in water quality due to the lower proportion of freshwater to sediment) and in turn reduce freshwater flows into the Dee Estuary to such a degree as to damage the interest features of that site through an increase in salinity. These risks are identified in the Environment Agency's (EA's) Review of Consents process for these sites.
- 3.91 The Martin Mere SPA/ Ramsar and several estuarine sites (e.g., the Ribble & Alt Estuaries SPA/ Ramsar) within and around the LCRCA area depend on sufficient freshwater input. Furthermore, the Sefton Coast SAC, partly designated for its population of great-crested newts, relies on the water table to maintain the hydrological regime in its breeding ponds.

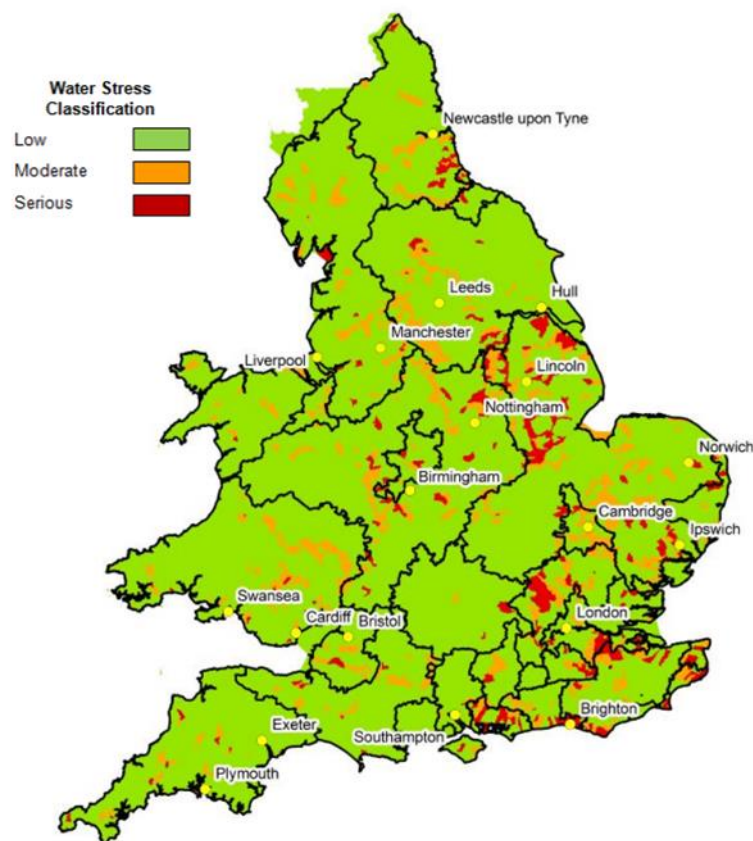


Figure 2: Areas of water stress in England and Wales<sup>78</sup>

## Conclusion

3.92 United Utilities have prepared a Water resources Management Plan (WRMP)<sup>79</sup>. This plans for water provision across the LCRCA area to 2045 and is based on robust population projections and also takes account of climate change. This plan has been subject to its own HRA<sup>80</sup> that concluded “...*the plan will have no adverse effects, alone or in combination, on any European sites taking into account established scheme-level mitigation and avoidance measures that will clearly be available, achievable and likely to be effective.*” Dŵr Cymru Welsh Water have also prepared a WRMP<sup>81</sup>, which again was subject to its own HRA and at the time of writing this report have prepared a revised Draft WRMP 2024<sup>82</sup>, the HRA of which states “*Therefore it can be concluded that the WRMP (if adopted as drafted) will have no adverse effects, alone or in combination, on the integrity of any European sites.*”

3.93 This, combined with the EA’s Review of Consents process, allows this impact pathway to be **screened out**.

## Background to Coastal Squeeze

3.94 In the past, definitions of coastal squeeze have shown some variations. A project carried out by the Environment Agency<sup>83</sup> has provided a new definition which clarifies the habitats that it can apply to and the types of habitat loss that do not constitute coastal squeeze:

*“Coastal squeeze is 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*

<sup>78</sup> Figure adapted from Environment Agency. 2013. Water stressed areas – final classification

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/244333/water-stressed-classification-2013.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/244333/water-stressed-classification-2013.pdf).

<sup>79</sup> United Utilities Final Water Resources Management Plan 2019

<sup>80</sup> amec foster wheeler (2019) United Utilities Final Water Resources Management Plan 2019: Habitats Regulations Assessment. Screening and Appropriate Assessment

<sup>81</sup> Dŵr Cymru Welsh Water Final Water Resources Management Plan 2019 <https://www.dwrcymru.com/en/our-services/water/water-resources/final-water-resources-management-plan-2019>

<sup>82</sup> <https://www.dwrcymru.com/en/our-services/water/water-resources/draft-water-resources-management-plan-2024>

<sup>83</sup> Environment Agency (2021) What is Coastal Squeeze?



*occur in response to SLR (sea level rise) in conjunction with other coastal processes. Coastal squeeze affects habitat on the seaward side of existing structures.”*

- 3.95 The definition focuses around whether the natural landward movement of habitats under rising sea levels is slowed or prevented by man-made structures or management actions.
- 3.96 The project demonstrated that even under natural baselines (in other words, without defences), the area (extent) of habitat (for example, saltmarshes) may decrease over time if steeply rising land means there is not enough room for habitat to migrate landwards. If this happens, any resulting habitat losses would be a form of natural change (accepting that accelerated sea level rise is not really ‘natural’).
- 3.97 Previously, the term coastal squeeze was most commonly applied to saltmarshes (following Doody’s<sup>84</sup> original definition), but sometimes to other habitats. A review of Annex I, Section 41 and Environment Act Section 7 for Wales priority coastal/intertidal habitats suggests that the following habitats could be subject to coastal squeeze:
- Boulder beaches
  - Shingle beaches and barriers
  - Intertidal seagrass beds
  - Intertidal reedbeds
  - Intertidal rock platforms
  - Mud and sandflats
  - Saline lagoons located in front of structures
  - Saltmarsh
  - Sand beaches
  - Sand dunes
- 3.98 Coastal squeeze cannot be assessed in detail until actual site allocations exist, but it can be at least broadly considered in the LCRCA SDS HRA.

## Conclusion

- 3.99 The current Shoreline Management Plan (SMP) process for North West England<sup>85</sup> will be the main process whereby the losses due to flood defences and coastal squeeze, and the gains due to managed retreat along the frontage will be identified at a strategic level. However, local authorities can also contribute to minimising squeeze by appropriately situating new development in line with Shoreline Management Plan policy.
- 3.100 This impact pathway can therefore be **screened out**.

## Background to Renewable Energy

### Wind turbines – impacts on SAC and SPA species

- 3.101 There are increasing concerns about the ecological impacts of wind turbines, including qualifying species of SPAs, Ramsars and SACs. This interest was initially triggered due to large numbers of bird fatalities around wind farms in North America and Europe. Bat fatalities initially received little interest, until approx. 1,400 – 4,000 bats were estimated to have been killed at a wind farm in West Virginia, USA, although UK bats do not migrate in such large congregations as US examples. It is worth noting that wind farm design and layout can be fundamental to the potential collision risk. The most notorious wind farms internationally were created in the 1970’s and are generally old designs (for example with lattice structures to the towers) and inappropriately located. The following paragraphs summarise some of the evidence for displacement disturbance and direct mortality effects of wind turbines on birds and bats.

<sup>84</sup> Doody, P.J. (2004) ‘Coastal squeeze’ – an historical perspective. Journal of Coastal Conservation **10** 129-138

<sup>85</sup> North West & North Wales Coastal Group (2010) North West England and North Wales Shoreline Management Plan SMP2

## Birds

### Collision mortality

- 3.102 There is a large body of research linking wind energy developments to bird displacement and mortality. A joint report by Natural England and the RSPB<sup>86</sup> highlights that poorly sited wind farms can have negative impacts on birds, with such impacts varying depending on the species involved, season, weather, habitat type and individual site characteristics (e.g. topography). Wind energy is still a relatively new technology and the evidence base has increased dramatically in recent years. Generally, the two predominant effects on birds associated with wind turbines are direct collision, and disturbance displacement (which includes a phenomenon known as the ‘barrier effect’).
- 3.103 Generally, onshore wind farms in the UK have not been associated with high bird collision rates because they tend to be constructed in areas with little bird activity. This is in contrast to wind farms in the US and Spain, for which a high number of annual fatalities (particularly for birds of prey) have been recorded. Different species vary in their susceptibility to collision, with raptors<sup>87</sup>, gulls<sup>88</sup>, terns<sup>89</sup> and geese<sup>90</sup> appearing to be associated with particularly high collision risks. One potential explanation is that larger, less manoeuvrable species are more likely to be collision victims than, for example passerines (although this clearly does not explain the sensitivity of some species, e.g. terns which are highly manoeuvrable).
- 3.104 The statutory process of Environmental Impact Assessment (EIA) employs a method referred to as the ‘Band’ Collision Risk Model, which estimates the number of collision fatalities associated with specific wind energy schemes, based on parameters such as turbine height, blade width and turbine avoidance rates. While clearly helpful in estimating the impact of a scheme, many of the model parameters (e.g. turbine avoidance rate) are poorly quantified. Furthermore, collision models assume that collision rate relates to bird abundance, which is not necessarily the case. The RSPB recommends that ‘*estimates of annual collision rates and avoidance rates should be treated with caution, and used as comparative rather than absolute measures*’.

### Disturbance displacement and impacts on flight-lines

- 3.105 Wind turbines may also result in disturbance displacement, rendering habitats currently used by birds unsuitable for future use. In a review across 129 wind farms, Hoetker et al. (2006) found that disturbance displacement effects were most common in the overwintering period, with highest impacts on waders and wildfowl<sup>91</sup>. One potential explanation for this is that overwintering birds display lower site fidelity, moving to alternative sites more readily than breeding birds when disturbed. Notwithstanding this, further work has evidenced disturbance displacement from wind energy schemes in breeding golden plover of at least 200m and other breeding waders of between 0 – 800m<sup>92,93</sup>. Disturbance displacement can affect bird species in several ways, including the direct loss of habitat (e.g. for foraging, resting, moulting or nesting) or by affecting productivity. The latter could be the result of high energetic costs associated with the displacement or displacement to potentially less plentiful foraging grounds. While it is frequently suggested that birds may habituate to wind turbines over time, research indicates that bird abundances decline over time and that there is in fact little empirical evidence for a strong habituation effect.
- 3.106 Related to this is a process known as the ‘barrier effect’, whereby larger scale wind farms prevent birds from using their established foraging / migratory flight-lines. This can provide a barrier to bird movements,

<sup>86</sup> Bright J.A., Langston R.H.W. & Anthony S. (2009). Mapped and written guidance in relation to birds and onshore wind energy development in England. A report by the Royal Society for the Protection of Birds. RSPB Research Report No. 35, 173pp.

<sup>87</sup> Anderson, R., Neumann, N., Tom, J., Erickson, W. P., Strickland, M. D., Bourassa, M., Bay, K. J. and Sernka, K. J. (2004). Avian Monitoring and Risk Assessment at the Tehachapi Pass Wind Resource Area. Period of Performance: October 2, 1996 - May 27, 1998. National Renewable Energy Laboratory, Colorado. [www.nrel.gov/publications](http://www.nrel.gov/publications) Last accessed 12/01/2021.

<sup>88</sup> Hötter, H., Thomsen, K.-M. and Jeromin, H. (2006). Impacts on biodiversity of exploitation of renewable energy sources: the example of birds and bats- facts, gaps in knowledge, demands for further research, and ornithological guidelines for the development of renewable energy exploitation. Michael-Otto-Institut im NABU, Bergenhusen. <http://bergenhusen.nabu.de/bericht/englische%20windkraftstudie.pdf> Last accessed 11/01/2021.

<sup>89</sup> Everaert, J. and Stienen, E. W. M. (2006). Impact of wind turbines on birds in Zeebrugge (Belgium) - Significant effect on breeding tern colony due to collisions. *Biodiversity and Conservation* **16**: 3345-3359.

<sup>90</sup> Moorehead, M. and Epstein, L. (1985). Regulation of small-scale energy facilities in Oregon: Background report. Volume 2. Oregon Department of Energy, Salem, USA.

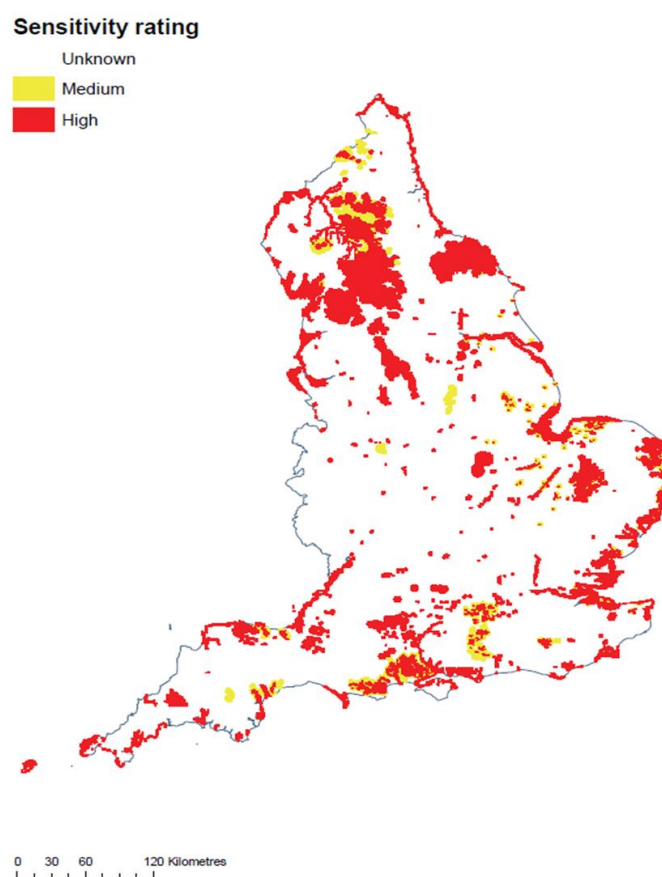
<sup>91</sup> Hötter, H., Thomsen, K.-M. and Jeromin, H. (2006). Impacts on biodiversity of exploitation of renewable energy sources: the example of birds and bats- facts, gaps in knowledge, demands for further research, and ornithological guidelines for the development of renewable energy exploitation. Michael-Otto-Institut im NABU, Bergenhusen. <http://bergenhusen.nabu.de/bericht/englische%20windkraftstudie.pdf> Last accessed 11/01/2021.

<sup>92</sup> Pearce-Higgins, J. W., Stephen, L., Langston, R. H. W. and Bright, J. A. (2008). Assessing the cumulative impacts of wind farms on peatland birds: A case study of golden plover *Pluvialis apricaria* in the UK. *Mires and Peat* **4**: 1-13.

<sup>93</sup> Pearce-Higgins J.W. Stephen L., Langston R.H.W., Bainbridge I.P. & Bullman R. (2009). The distribution of breeding birds around upland wind farms. *Journal of Applied Ecology* **46**: 1323-1331.

resulting in significant additional energetic costs as birds must circumvent the area of development. This effect is likely to be more pronounced offshore because seabirds travel greater return distances between their colonies and foraging grounds, such that the increased energetic requirements are likely to become disproportionately impactful. Research has shown that wind farms lead to avoidance behaviour in migrating birds. For example, common eiders had greater trajectory curvatures post wind farm construction, resulting in an additional 500m travelled<sup>94</sup>. However, in relation to migration episodes of 1,400km, the further energetic costs were considered to be trivial. In another study it was established that the overall energetic costs of avoiding wind farms were highest for species with high wing loadings, such as shag, cormorant, guillemot and puffin, which typically only undertake short provisioning flights<sup>95</sup>. For all species the extra flight costs to avoid wind energy developments were lower than those associated with food shortages or adverse weather. However, it is to be noted that pressures from wind farms are additive to those of other stressors and a cumulative effect with other schemes requires consideration.

3.107 Figure 3 below shows a map of areas known for their European bird interest that are sensitive to wind energy development schemes. The map is based on the distributional data of twelve susceptible bird species (ten of the species listed on Annex I of the EU Birds Directive) and the geographic location of statutory SPAs. The LCR shoreline is classed as highly sensitive to wind turbine development.



**Figure 3: Map of sensitive bird areas in relation to onshore wind farms in England. Note that this map is based on the highest sensitivity rating for any of the species or sites included, in each constituent 1-km square. (reproduced from Bright et al., 2009<sup>96</sup>).**

<sup>94</sup> Masden E.A., Haydon D.T., Fox A.D., Furness R.W., Bullman R. & Desholm M. (2009). Barriers to movement: Impacts of wind farms on migrating bird ICES s. *Journal of Marine Science* **66**: 746-753.

<sup>95</sup> Masden E.A., haydon D.T., Fox A.D. & Furness R.W. (2010). Barriers to movement: Modelling energetic costs of avoiding marine wind farms amongst breeding seabirds. *Marine Pollution Bulletin* **60**: 1085-1091.

<sup>96</sup> Bright J.A., Langston R.H.W. & Anthony S. (2009). Mapped and written guidance in relation to birds and onshore wind energy development in England. *A report by the Royal Society for the Protection of Birds. RSPB Research Report No. 35*, 173pp.

## Bats

- 3.108 Wind turbines have effects on bats and their populations in several ways. As well as mortality from turbine blades, bats may be affected by loss of foraging habitat; the blocking commuting or migration routes; and ultrasound emission by wind turbines.
- 3.109 Initial European studies of bat casualties at wind farms indicate that most casualties occur during migration and more recent findings have found evidence that resident bat populations are vulnerable, particularly where turbines are sited close to woodland. Locating a wind farm along a bat migration route would increase the risk of casualties, as would siting a single turbine along a flight path next to a nursery roost, or at a woodland edge<sup>97, 98</sup>.

## Collision mortality

- 3.110 Both in North America and Europe, evidence of bat collisions has led to growing concern about the siting and operation of wind turbines. The most serious incidents have involved bat species that fly very high and for long journeys, particularly species on long distance migrations. Noctule, common pipistrelle and Nathusius' pipistrelle bat species are the most frequently recorded as wind turbine casualties on mainland Europe<sup>99</sup>.
- 3.111 Bats are killed at turbines either by direct contact or more frequently by barotrauma causing haemorrhaging of the lungs. Bats contacting rotor blades of turbines have been recorded on thermal imaging video by Horn et al in 2008<sup>100</sup>. The study showed that blade rotational speed was a significant negative predictor of collisions with turbine blades, suggesting that bats may be at higher risk of fatality on nights with low wind speeds. However, in a Canadian study<sup>101</sup> (Baerwald et al, 2008) it was found that 90% of the 75 bat fatalities examined were killed by burst blood vessels in the lungs. As the wind moves through a wind turbine's blades the air pressure drops behind them drops by five to 10 kilopascals (a pascal is a unit of pressure). Any bat flying into such an undetectable low pressure zone would find its lungs and blood vessels rapidly expanding and, quickly, bursting under the new conditions.
- 3.112 Research carried out by the University of Exeter<sup>102</sup> showed that bat casualties occur at British wind energy installations at rates similar to those reported elsewhere in Europe. A total of 46 commercial wind turbine sites across England, Wales and Scotland were visited. The collision rate per turbine ranged from 0 to 5.25 bats turbine<sup>-1</sup> month<sup>-1</sup> during the survey period (July-October). At a third of sites, no casualties were found, and at 15% of sites, the rate exceeded 1 bat turbine<sup>-1</sup> month<sup>-1</sup>. The species identified as being at highest risk of collision are common pipistrelle, soprano pipistrelle and noctule bats. This finding also aligns with evidence collected elsewhere in Europe. Single casualties of Nathusius' pipistrelle, brown long-eared and Natterer's bats were also found.

## Bat migration

- 3.113 In the United States and Europe higher casualty rates to bats from wind turbines occur during migration between summer and winter roost sites. It is not clear why this is but one suggestion is that bats orientate themselves other than by echolocation during migration and so be less able to detect turbine blades. In Sweden Ahlén (2003)<sup>103</sup> observed that bat used echolocation but the calls had a slower rhythm during migration<sup>104</sup>.
- 3.114 Migratory flights also may account for increased bat density around wind farms as individuals or groups of some species make stopovers to feed, drink, and roost in trees. As with resident populations, migrants or groups of bats making stopovers may be similarly attracted to these areas to feed<sup>105</sup>. However, little is known

<sup>97</sup> Mitchell-Jones, T. & Carlin, C. 2009. Natural England Technical Information Note TIN051 Bats and onshore wind turbines: Interim guidance. *Peterborough: Natural England*.

<sup>98</sup> Matthews, J., Mitchell-Jones, T. & Raynor, R. 2009. Natural England Technical Information Note TIN059 Bats and single large wind turbines: Joint Agencies interim guidance. *Peterborough: Natural England*.

<sup>99</sup> Ibid

<sup>100</sup> Horn, J. W., Arnett, E. B. & Kunz, T. H. 2008. Behavioral Responses of Bats to Operating Wind Turbines. *Journal of Wildlife Management* **72** (1), 123 - 131

<sup>101</sup> Baerwald, E. F., D'Amours, G. H., Klug, B. J. & Barclay, R. M. R. 2008. Barotrauma is a significant cause of bat fatalities at wind turbines. *Current Biology*, **18**, **16**, R695-R696, 26 August 2008

<sup>102</sup> Mathews, F., Richardson, S., Lintott, P. & Hosken, D. Understanding the Risk to European Protected Species (bats) at Onshore Wind Turbine Sites to Inform Risk Management. *University of Exeter*

<sup>103</sup> Ahlén, I. 2003. Wind turbines and bats - a pilot study. *Report to the Swedish National Energy Administration*, 11 December 2003

<sup>104</sup> Betts, S. 2006. Are British bats at risk from windfarms?: *British Wildlife*, June 2006, 339-345

<sup>105</sup> Horn, J. W., Arnett, E. B. & Kunz, T. H. 2008. Behavioral Responses of Bats to Operating Wind Turbines. *Journal of Wildlife Management* **72** (1), 123 - 131

about bat migration in Britain although research has been done in Europe. For example, Nathusius' pipistrelle bats have been found on oil rigs in the North Sea and two bats of the species captured in Sweden were later recovered in Germany and Belgium<sup>106</sup>.

3.115 In Britain there is evidence for migration of individual greater horseshoe bats between roosts in Gloucestershire, through Somerset to the Isle of Purbeck in Dorset. It is not known at what height these bats migrate (Jon Flanders, University of Bristol<sup>107</sup>). Movement of bats does occur between summer and winter roost sites and these can be some kilometres distant.

## Conclusion – wind turbines

3.116 Overall, the available baseline information suggests that the following European Sites are potentially sensitive to the impacts from wind turbines (the sites in bold are taken forward into the following chapters):

- **Mersey Estuary SPA/ Ramsar**
- **Mersey Narrows and North Wirral Foreshore SPA/ Ramsar**
- **Dee Estuary SPA/ Ramsar**
- **Ribble and Alt Estuaries SPA/ Ramsar**
- **Liverpool Bay/ Bae Lerwpl SPA**
- **Martin Mere SPA/ Ramsar**
- **Alyn Valley Woods/ Coedwigoedd Dyffryn Alun SAC**

3.117 The Dee Estuary SAC, Sefton Coast SAC, Manchester Mosses SAC, Halkyn Mountain/ Mynydd Helygain SAC, Deeside and Buckley Newt Sites SAC, Oak Mere SAC, River Dee and Bala Lake, Afon Dyfrdwy a Llyn Tegid SAC and the River Eden SAC can all be **screened out** from this impact pathway as these sites are designated for non-mobile and/ or terrestrial and/ or aquatic species.

## Hydroelectricity

3.118 There are several types of hydroelectric system, which are all based on similar technologies in that the power of water is used to turn impulse turbines (driven by falling water diverted from a reservoir) or reaction turbines (fully submerged in actively flowing waterbodies). Run-of-the-river hydrologic systems don't use a large reservoir of water but use the continuous supply of moving water provided by a river. Tidal hydroelectricity uses fully submerged reaction turbines (often installed across a bay) that exploit the difference in head between high and low tides. Newer tidal hydro systems (also called tidal stream generators) use individual propellers mounted on underwater masts similar to wind farms. In recent years an increasing body of evidence regarding the environmental impacts of hydroelectricity has emerged, with impacts on ecosystems depending on the type of system used. The below sections provide a brief overview of relevant research findings.

## Impacts on marine mammal and fish mobility/ migrations

3.119 Impacts on fish migrations are most likely to result from run-of-the-river (ROR) hydropower schemes. ROR schemes generally require in-channel barriers (e.g. a weir) to divert a portion of the river channel flow towards a turbine. This imposes two key modifications to the river ecosystem, in-channel barriers and resultant changes in flow regime. The presence of in-channel barriers disrupts the longitudinal connectivity and alters the in-channel physical habitat of the river. Disrupting the longitudinal continuum in rivers hinders the natural downstream movement of aquatic species and plant propagules, while also impeding the natural mobility of fish, for example to seek out preferred foraging areas. Importantly, the introduction of weirs also prevents the upstream migration of anadromous fish (e.g. salmonids), lamprey or eel, rendering them unable to access spawning grounds and threatening life-cycle completion<sup>108</sup>. In a study of 20 ROR schemes in the River Gave de Pau (France), 17% of the barriers were found to pose major obstacles to fish migration and 33% caused a partial delay in arrival at breeding grounds<sup>109</sup>.

<sup>106</sup> Betts, S. 2006. Are British bats at risk from windfarms?: *British Wildlife*, June 2006, 339-345

<sup>107</sup> Mathews, F., Richardson, S., Lintott, P. & Hosken, D. Understanding the Risk to European Protected Species (bats) at Onshore Wind Turbine Sites to Inform Risk Management. *University of Exeter*

<sup>108</sup> Gauld N., Campebl R & Lucas M. (2013). Reduced flow impacts salmonid smolt migration in a river with low-head weirs. *Science of the Total Environment* **458**: 435-443.

<sup>109</sup> Larinier M. (2008). Fish passage experience at small-scale hydro-electric power plants in France. *Hydrobiologia* **609**: 97-108.

3.120 Mitigation measures for the barrier effect of in-channel structures (e.g. weirs) predominantly exist in the form of fish pass installations (see Anderson et al. (2015) for a comprehensive summary<sup>110</sup>). The main focus in the UK has been on upstream passage (allowing migratory fish to reach their spawning grounds) installations, including rock ramps, natural bypass channels and weir and pool fishways. The uptake of downstream passage installations (e.g. spill ways or screened surface bypass collectors) has been increasing in the UK in recent years. However, it is to be acknowledged that the effectiveness of fish passes remains understudied (with the exception of salmonid passage<sup>111</sup>).

### Impacts on water quantity and sedimentation

3.121 The introduction of in-channel barriers is also likely to impact the physical habitat of rivers, both in terms of water quantity and sedimentation. For example, the raised water levels upstream of weirs reduce flow velocity and turbulence, promoting fine sediment deposition and creating lentic environments more akin to ponds<sup>112</sup>. In turn these environments incur changes in their populations of benthic algae, macrophytes and riparian vegetation, while also exhibiting lower biodiversity.

3.122 When operational, the diversion of flow through hydropower schemes creates a depleted stretch of a river (from the point of abstraction to where water is returned to the main channel) with potentially significantly reduced water flow. Depleted flows in stretches of rivers affected by hydropower schemes have found reduced lotic habitat<sup>113</sup>, which may confine organisms and increase competition for food resources and space<sup>114</sup>. Moreover, studies on the impacts of low flow on riverine ecosystems show reductions in biomass, changes in species composition and shifts in population structure. However, it is to be noted that many of the observed effects stem from large hydropower schemes outside of Europe, which do not have the same legislative requirements for retention of river flows within narrow limits.

3.123 As highlighted in the previous section, one of the main mitigation measures against flow depletion involves the use of minimum flow requirements in river stretches subjected to lower water quantities. For example, UK legislation enforced by the Environment Agency (and driven by the EU Water Framework Directive) sets 'hands off' flow conditions during which water must not be diverted from rivers. Threshold flows between Q85 and Q95 are required for water to be utilised towards hydropower schemes (depending on scheme location and type).

### Impacts on ecological communities (e.g., intertidal habitats)

3.124 In some instances, where impoundment reservoirs are created using dams, hydroelectric schemes may completely interrupt the river continuum. This converts a fluvial ecosystem to a lacustrine one, resulting in large-scale ecosystem changes. For example, in a fourth-order stream in Nigeria, the density of three taxonomic groups (Diptera, Oligochaeta and Ephemeroptera) was significantly reduced downstream from the dam, with potential knock-on impacts on higher order biota such as fish<sup>115</sup>. The installation of hydroelectric dams may also affect in-river plant communities, particularly downstream from schemes. For example, reduced flow velocities and scour downstream from dams promote channel sedimentation and increase stream bed stability for colonisation by aquatic macrophytes. These factors are likely to impact the composition of plant communities, promoting development of rooted plants and sediment-tolerant plant species<sup>116</sup>. These impacts are more strongly associated with large traditional dams. A key difference between a dam and a barrage is that a dam is built for water storage in a reservoir, which raises the level of water significantly. A barrage is built for diverting water and raises the water level by only a few feet.

3.125 Tidal barrages have been suggested as a potential solution for delivering much of the UK's energy demand. These effectively involve the creation of a barrage across an estuary, comprising a series of sluices with turbines. At high water the sluices are closed, and the water level is held stable, until the receding tide establishes sufficient head to enable the generation of power. However, barrages are known to be associated with more severe impacts on ecological communities and their habitats. Research has indicated

<sup>110</sup> Anderson D., Moggridge H., Warren P. & Shucksmith J. (2015). The impacts of 'run-of-river' hydropower on the physical and ecological condition of rivers. *Water and Environment Journal*

<sup>111</sup> Noonan M., Grant J. & Jackson C. (2012). A quantitative assessment of fish passage efficiency. *Fish Fish* **13**: 450-464.

<sup>112</sup> Mueller M., Pander J. & Geist J. (2011). The effects of weirs on structural stream habitat and biological communities. *Journal of Applied Ecology* **48**: 1450-1461.

<sup>113</sup> Ovidio M., Capra H. & Philippart J. (2008). Regulated discharge produces substantial demographic changes on four typical fish species of a small salmonid stream. *Hydrobiologia* **609**: 59-70.

<sup>114</sup> Riley W., Maxwell D., Pawson M. & Ives M. (2009). The effects of low summer flow on wild salmon (*Salmo salar*), trout (*Salmo trutta*) and grayling (*Thymallus thymallus*) in a small stream. *Freshwater Biology* **54**: 2581-2599.

<sup>115</sup> Ogbeibu A.E. & Oribhabor B.J. (2002). Ecological impact of river impoundment using benthic macro-invertebrates as indicators. *Water Research* **36**: 2427-2436.

<sup>116</sup> McCartney M.P., Sullivan C. & Acreman M.C. (2001). Ecosystem impacts of large dams. Background Paper Nr. 2 – Prepared for IUCN / UNEP / WCD. 76pp.

that the construction of a tidal barrage could reduce the tidal range approx. 50%, thereby reducing the extent of intertidal habitats (e.g. mudflats or saltmarsh) available to qualifying birds<sup>117</sup>. As a result, the carrying capacity of intertidal habitats surrounding tidal barrages may decrease significantly. Tidal energy barrages have also been modelled to result in altered species distributions and food web dynamics in the Severn Estuary<sup>118</sup>.

### Increased fish mortality and impingement

3.126 The disruption of longitudinal connectivity within rivers caused by in-channel barriers (e.g. weirs) may direct diadromous<sup>119</sup> and potadromous fish<sup>120</sup> species along the major flow currents into hydropower schemes, which can result in injury or mortality<sup>121</sup>. Where screening is employed to prevent entry, this may also lead to the impingement of fish against the screening mesh, also resulting in potentially fatal injuries. Lack of suitable bypasses at screened schemes may also impede fish movements, as the low flows over weir crests can discourage downstream mobility<sup>122</sup>. One potential mitigation solution for such direct impacts are the use of slower rotating devices (e.g. Archimedean screws) in in-weir schemes<sup>123</sup>. These allow most fish to pass unharmed and only require very coarse screening.

3.127 It is to be noted that a European site can also be indirectly sensitive to the loss of fish, because its qualifying species depend on fish as a critical foraging resource. This is more likely to be an issue where specific fish species and bird species are involved, i.e., those depending on fish as their primary foraging resource.

## Conclusion - hydroelectricity

3.128 Overall, the available baseline information suggests that the following European Sites are potentially sensitive to the impacts from hydroelectric schemes (the sites in bold are taken forward into the following chapters):

- **Mersey Estuary SPA/ Ramsar**
- **Mersey Narrows and North Wirral Foreshore SPA/ Ramsar**
- **Dee Estuary SPA/ Ramsar**
- **Ribble and Alt Estuaries SPA/ Ramsar**
- **Sefton Coast SAC**
- **Liverpool Bay/ Bae Lerwpl SPA**
- **River Dee and Bala Lake, Afon Dyfrdwy a Llyn Tegid SAC**

3.129 Martin Mere SPA/ Ramsar, Manchester Mosses SAC, Halkyn Mountain/ Mynydd Helygain SAC, Deeside and Buckley Newt Sites SAC, Oak Mere SAC and Alyn Valley Woods/ Coedwigoedd Dyffryn Alun SAC are not connected to any main river and are all inland so would not be affected by tidal energy schemes. The River Eden SAC is c.90 km from the LCRCA boundary and unlikely to be affected by tidal energy schemes. These sites can therefore be **screened out** from this pathway.

<sup>117</sup> Clark N.A. (2006). Tidal barrages and birds. *Ibis* **148**: 152-157.

<sup>118</sup> Baker A.L., Craighead R.M., Jarvis E.J., Stenton H.C., Angeloudis A., Mackie L., Avdis A., Piggott M.D. & Hill J. (2020). Modelling the ecological impacts of tidal barrages. Preprint submitted to Elsevier Science. Available at: <https://eartharxiv.org/vapmu/> [Accessed on the 13/01/2021]

<sup>119</sup> Diadromous fish describes species that spend part of their lives in freshwater and part in saltwater. There are two categories of diadromous fish: catadromous and anadromous. Catadromous fish hatch or are born in marine habitats but migrate to freshwater areas where they spend the majority of their lives growing and maturing. Anadromous fish are the opposite of catadromous fish in that hatching and a juvenile period occur in freshwater. This is followed by migration to and maturation in the ocean.

<sup>120</sup> Potamodromous fish are born in upstream freshwater habitats, then migrate downstream (still in freshwater) as juveniles to grow into adults before migrating back upstream to spawn. In other words, they migrate, but remain in a freshwater environment

<sup>121</sup> Svendsen J., Aarestrup K., Deacon M. & Christensen R. (2010). Effects of a surface orientated travelling screen and water abstraction practices on downstream migrating *Salmonidae* smolts in a lowland stream. *River Resources Applied* **26**: 353-361.

<sup>122</sup> Gauld N., Campbell R. & Lucas M. (2013). Reduced flow impacts salmonid smolt migration in a river with low-head weirs. *Science of the Total Environment* **458**: 435-443.

<sup>123</sup> Bracken F. & Lucas M.C. (2013). Potential impacts of small-scale hydroelectric power generation on downstream moving lampreys. *River Research Applied* **29**: 1073-1081.

## Background to Global Trade

3.130 Post-Brexit, there is a substantial opportunity for the Liverpool City Region to be maximising the potential benefits of a global trade strategy, whether boosting the export potential of goods and services or sourcing components and supplies through an improved import strategy.

## Liverpool City Region Freeport

3.131 Freeports are specific geographic areas which have different tax and customs rules than the rest of the country. They broadly consist of Customs and Tax Zones.

3.132 Imports can enter freeport customs zones with simplified customs procedures and do not have payable tariffs. Businesses operating within these designated areas can take advantage from the deferment of tariffs until their products are moved elsewhere, to another part of the country. They can avoid tariffs and full procedures altogether if they bring in goods to manufacture on site before exporting them again to an international market.

3.133 The Liverpool City Region Freeport proposition is focused on meeting the core freeport objectives set out by Government: *to establish a national hub for global trade and investment, promote regeneration and job creation and sustain a hotbed of innovation*. The LCR Freeport bid was submitted on Friday 5<sup>th</sup> February 2021 to Treasury and granted in March 2021.

3.134 Liverpool City Region has a long history of developing and managing Freeports through the work of Peel Ports (Mersey Docks and Harbour Company) in the 1980's and 1990's. Liverpool, as a nationally significant, deep water, west facing port, is a natural location for a Freeport because of a renewed emphasis on global trade post-Brexit. The designated Freeport sites, which include a number of existing rail terminals in Knowsley, Sefton, Halton and planned rail terminals in St Helens and Salford, are located within established and emerging areas of logistics and manufacturing capability and within populated parts of the City Region (Figure 4).

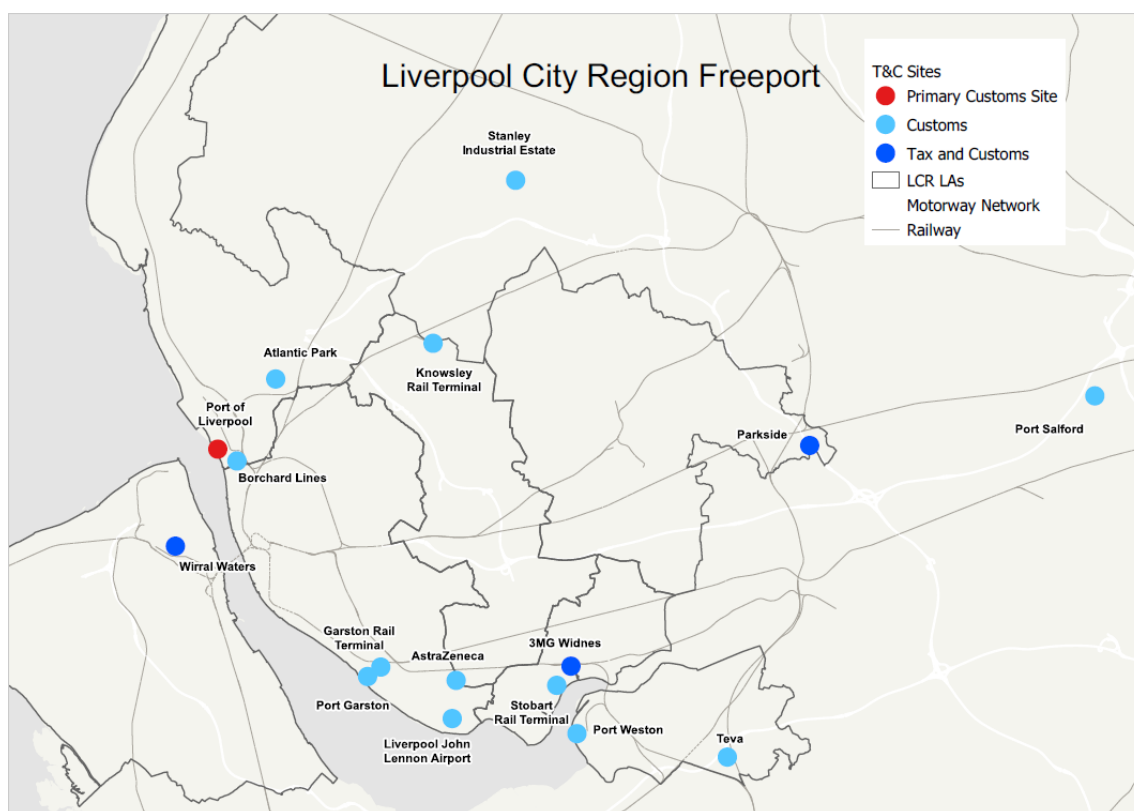


Figure 4: Proposed Liverpool City Region Freeport



- 3.135 The Port of Liverpool operates two container terminals, the Royal Seaforth Container Terminal (RSCT) and Liverpool2. These currently handle 60 vessels per month<sup>124</sup>. An increase in shipping and road traffic as a result of the Freeport status could result in increased levels of disturbance, water and air quality impacts. Further expansion of the Port could also result in the loss of functionally linked habitat.
- 3.136 The construction and maintenance of ports and inland shipping channels also poses a number of environmental risks<sup>125</sup>. Of particular importance is the dredging necessary to permit large vessels to enter ports, or to maintain inland channels. In natural estuaries and harbours, there is a balance between sediment transported out to sea and that which flows in with rivers and runoff, which tends to maintain an equilibrium depth. Often this is not deep enough to allow vessels safe passage, so navigational channels and harbours are dredged to deepen them. Because natural forces will tend to build up sediment until the channels and port return to their equilibrium, dredging to maintain safe depth is an ongoing maintenance activity. The need for such dredging is likely to increase in the future as ships become larger and require deeper ports or as inland water transport grows in importance.
- 3.137 Dredging poses direct threats to the areas in which it occurs. It introduces sediment into the adjacent water column, which is then redeposited on the bottom. This has a variety of usually short-term effects on pelagic fish and the benthic community. The suspended sediment increases turbidity, decreasing light penetration and photosynthetic activity. Dredging can also have longer term effects on water circulation patterns, particularly in estuarine areas where water circulation determines the distribution of fresh and salt water, patterns of dissolved oxygen, and other water quality parameters. Changes in salinity can affect the viability of freshwater wetlands and tidal marshes, with consequent impacts on the distribution of marine life. Changes in water circulation patterns can also alter sediment accumulation, thus affecting all ecosystems in the immediate area<sup>126</sup>.

## Liverpool John Lennon Airport Master Plan

- 3.138 Liverpool John Lennon Airport (LJLA) is one of the UK's largest regional airports and a significant economic driver and transport asset. It is of strategic importance to the economy and connectivity of the Liverpool City Region.
- 3.139 The expansion of the Liverpool John Lennon Airport is an explicit element of national government policy as set out in the White Paper 'The Future of Air Transport' (2003). The 'Liverpool John Lennon Airport Master Plan to 2050' (March 2018)<sup>127</sup> shows how the Airport intends to respond to the White Paper's objectives and involves the construction of new terminal facilities, with additional car-parking, as well as new cargo handling and aircraft maintenance facilities, a mixed-use development and hotel.
- 3.140 The airport operator also envisages an extension to the runway, extension of the northern parallel taxiway and additional apron areas and the Eastern Access Transport Corridor (EATC). There would also be a requirement for an expanded fuel farm facility and a waste-water treatment plant to serve the new cargo facilities. None of these are presented or analysed in detail in the Master Plan as the purpose of that document is to set out a long-term vision rather than detailed proposals. Elements of the Master Plan are to be developed in detail by the operator as the desire and need to progress to planning applications for each element arises. Proposals during the latter part of the Master Plan period to 2050 are inevitably less precise.
- 3.141 LJLA lies immediately adjacent to the Mersey Estuary SPA and Ramsar site. The Master Plan highlighted several potential adverse effects on nature conservation and biodiversity which could directly or indirectly affect the favourable conservation status. These potential effects are:
- severance of habitats;
  - bird and animal road deaths;
  - pollution to adjacent habitats by road run-off;

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<sup>124</sup> [www.peelports.com/our-ports/liverpool](http://www.peelports.com/our-ports/liverpool)

<sup>125</sup> OECD (ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT) (1997) The Environmental Effects of Freight

<sup>126</sup> Marine Board, Commission on Engineering and Technical Systems, National Research Council (1985), Dredging Coastal Ports: An Assessment of the Issues. (Washington, D.C.: National Academy Press) (pp124-128)

<sup>127</sup> John Lennon Liverpool Airport Master Plan March 2018. <https://www.liverpoolairport.com/media/2957/liverpool-john-lennon-airport-master-plan-to-2050.pdf> [accessed 04/10/2018]

- disturbance to feeding, roosting and breeding birds due to increased lighting; and
- changes to the hydrology of the area.

3.142 Potential indirect effects include:

- sourcing and transport of construction materials and possibly disturbance to feeding waterfowl during construction, depending on its timing. In addition, aircraft currently take off or land over the adjacent mudflats. Since these flats are used by a proportion of the passage and wintering waterfowl for which the Estuary is of international importance<sup>128</sup>, there is potential for an increase in such traffic to result in adverse effects on the Mersey Estuary SPA and the Ramsar site.

3.143 These impact pathways are discussed below, drawing on information currently available from the Airport.

3.144 For the previous 2007 version of the Master Plan a suite of ecological surveys were undertaken in connection with this Master Plan on land within and adjacent to JLA and on areas required for expansion<sup>129</sup>. The following was identified by Liverpool John Lennon Airport. It should be noted that these bullet points represent the views of the consultants only and not necessarily that of Merseyside Environmental Advisory Service (MEAS) and Natural England (NE) who would look to comment upon proposals at the appropriate stage stage:

- the majority of waterfowl feeding on the shore at low water use the area between Garston and the western end of the runway. On most tides many of these birds remain to roost, moving up the shore in front of the tide. A relatively high level of disturbance to both feeding and roosting birds occurs here due to the use of the shore by walkers, dogs, quad bikes and four wheel drive vehicles, and at sometimes many of the birds are kept almost constantly on the move;
- no disturbance to the feeding birds due to aircraft was observed in any month except on abnormally high tides when roosting flocks are pushed right up to the toe of the cliff. At such times they are at their most susceptible to disturbance from all sources. During all other tide states, including more regular high tide heights, no disturbance effects from aircraft have been observed;
- movements tend to be low and local, between the shore and adjacent land. No birds were seen to cross the airport flightpath during any survey visit, although single birds or small flocks of curlew have occasionally been recorded feeding on the fields north of Hale Heath. Curlew is not a qualifying species for the SPA and the Ramsar site, other than as part of the total assemblage, and at most, tens of birds have been recorded feeding in this area; and
- since the numbers involved were very small and birds disturbed at present appear to move the shortest possible distance, it was considered that there would be no significant impact to feeding or roosting birds using the shore adjacent to JLA, and thus no likely significant effect on the protected site. The proposed runway extension to 2,750 m would not encroach on the Mersey Estuary SPA and the Ramsar site.

3.145 Since that time, further bird surveys have been carried out. The most recent (March 2018) Master Plan<sup>130</sup> states that '*extensive surveys were carried out*' and that '*High and low water surveys for waterfowl and waders, covering the same areas together with the adjacent Mersey shore have been carried out for six consecutive winters since 2005/06... With the benefit of six full winters of surveys, particular importance was placed [in devising the Master Plan] on ensuring that there would be no adverse effect on the integrity of the internationally important Mersey Estuary SPA/Ramsar Site.*' However, it is noted that these surveys were undertaken 6 or 7 years ago and as such are no longer considered to provide up to date information of the use of site by designated bird features; smaller reliance should be placed on the data of this age. MEAS was not involved in scoping the 2005-2011 surveys but it is understood that further surveys were undertaken in the non-breeding period spanning late 2017 and early 2018. The 2017/2018 surveys were undertaken between August 2017 and mid-April 2018 within the area of the Oglet. The findings are presented in detail within Shadow HRA to support the Liverpool John Lennon Airport development<sup>131</sup>. The evidence presented within the Shadow HRA is discussed within the later paragraphs of this section. While the Shadow HRA

<sup>128</sup> The Masterplan states that '*The birds feed on the rich invertebrate fauna of the intertidal sediments as well as plants and seeds from the salt-marsh and agricultural land. The Estuary is also a valuable staging post for migrating birds in spring and autumn.*'

<sup>129</sup> John Lennon Liverpool Airport Master Plan November 2007

[http://www.liverpoolairport.com/assets/files/documents/oct\\_08/peel\\_1224146206\\_12\\_Master\\_Plan\\_Chapter\\_11.pdf](http://www.liverpoolairport.com/assets/files/documents/oct_08/peel_1224146206_12_Master_Plan_Chapter_11.pdf)

<sup>130</sup> John Lennon Liverpool Airport Master Plan March 2018. <https://www.liverpoolairport.com/media/2957/liverpool-john-lennon-airport-master-plan-to-2050.pdf>

<sup>131</sup> Atmos Consulting (December 2018). Shadow HRA. Land south of Liverpool John Lennon Airport (unpublished).

itself has no formal status within the Liverpool Local Plan process and has not been subject to consultation with NE, it does present additional evidence regarding bird surveys and use of the Oglet. It is understood further seasons of survey to inform emerging planning applications are being discussed.

- 3.146 With regards to noise disturbance from operational aircraft movements, Appendix 6 of the Master Plan shows operational daytime noise contours for 2030 and compares them to those for 2016. The data indicate that noise contours will be similar in 2030 to the 2016 contours and may be reduced in some locations. Notably, at the western end, approaching Bebington, a smaller area of mudflat will be exposed to daytime noise above 54dB than was the case in 2016. The appendix states that the same pattern is expected for night-time noise contours. Given this the airport expansion would not result in operational noise disturbance impacts above the current baseline. With regard to LJLA, this impact pathway can therefore be **screened out**.
- 3.147 With regard to water quality, surface water drainage from LJLA passes through various interceptor tanks before discharging into the River Mersey. There are five existing discharge points. Following construction there will be changes to impermeable and permeable surface areas. This will result in an increase in surface water flows from new car parks, highways and access roads, extended runway and aprons. There will also be an increase in roof drainage from the terminal extension and increase to the number of hangars and cargo developments. The existing drainage infrastructure will be used where appropriate with new drainage infrastructure constructed as necessary to accommodate the increased flows from the proposed developments. Interceptors will be located upstream of all outfalls where the surface water could be contaminated. The surface water from the additional pavement and hard standing areas for the Master Plan proposals for 2030 and 2050 will be drained via new main carrier drains installed for the 2030 proposals. Foul water drainage from the site passes through the Mersey Estuary Pollution Alleviation Scheme (MEPAS) interceptor and is pumped to the waste-water treatment works (WWTW) on Ramsbrook Lane. Under storm condition the interceptors may overflow, resulting in the combined foul and storm water outfalling to the River Mersey. However United Utilities has confirmed that this now only occurs in very extreme events. Assuming available capacity, foul water will discharge into the existing WWTW. Further foul drainage infrastructure will be required to accommodate the additional foul flows from the new developments. With these measures in place (and expanded upon for relevant planning applications) it is expected that water quality impacts on the European sites can be avoided. With regards to LJLA, this impact pathway can therefore be **screened out**.

## Conclusion

- 3.148 Overall, the available baseline information suggests that the following European Sites are potentially sensitive to the impacts from global trade (the sites in bold are taken forward into the following chapters):
- **Mersey Estuary SPA/ Ramsar**
  - **Mersey Narrows and North Wirral Foreshore SPA/ Ramsar**
  - **Dee Estuary SPA/ Ramsar**
  - **Sefton Coast SAC**
  - **Ribble and Alt Estuaries SPA/ Ramsar**
  - **Liverpool Bay/ Bae Lerwpl SPA**
- 3.149 Martin Mere SPA/ Ramsar has been screened out from this impact pathway for the reasons described at 3.121 above.
- 3.150 The River Dee and Bala Lake, Afon Dyfrdwy a Llyn Tegid SAC and the River Eden SAC have also been **screened out** as they are freshwater systems and sufficient distance away from the Port of Liverpool and LJLA.

## Background to Inappropriate Coastal Management

- 3.151 Inappropriate coastal management practices have been identified as a potential pathway for one designated site:
- Sefton Coast SAC – issues with strandline management and issues with parking on Ainsdale Beach.

- The Dee Estuary SAC – in some locations the inappropriate removal of strand line material, vegetation and raking can affect or reduce the potential formation of embryonic dunes and vegetated strandlines.
- 3.152 Wirral Borough Council have routinely carried out beach management operations at West Kirby, Wallasey and New Brighton beaches, which lie within the Dee Estuary SAC. Regular beach raking at West Kirby, Wallasey and New Brighton beaches is undertaken to provide a clean, litter free area of beach for amenity purposes.
- 3.153 Windblown sand from the sea wall at Hoylake Beach has previously been removed and used to manage the dune system at West Kirby – part of the Red Rocks SSSI. Accretion of sand over the entire site leads to a build-up of windblown sand against the sea defence wall. The action of the wind also results in sand deposition over the designated highway and beyond into adjacent private residential housing. This causes a hazard to road users and an inconvenience to home-owners.
- 3.154 Recent botanical surveys carried out in 2020<sup>132</sup> identified some rare species recorded at Hoylake, such as yellow glasswort *Salicornia fragilis* and found pioneer saltmarsh 'Atlantic salt meadows' and 'Embryonic shifting dunes' developing along Hoylake foreshore, which are features of the Dee Estuary SAC. There is concern that these beach management activities are having a detrimental effect on the development of the features of the SAC.
- 3.155 With regard to Sefton Coast SAC authorised parking on Ainsdale Beach, regulated by Sefton Metropolitan Borough Council, interrupts development of the dune system at Green Beach. This is not sustainable and a long-term solution is required to allow the Green Beach to develop.

## Conclusion

- 3.156 The beach cleaning operations are subject to their own HRA and are carried out subject to approval by Natural England. The HRA is reviewed and re-submitted to Natural England on five-year basis and, at the time of writing, Wirral Borough Council have assent from Natural England to carry out beach management operations at West Kirby, Wallasey and New Brighton beaches until 31<sup>st</sup> March 2027.
- 3.157 As part of the Sefton Coast Plan – 2030 and beyond, Sefton Coast Landscape Partnership are preparing a Visitor Management Strategy that will lead to actions that provide a sustainable approach to providing visitor facilities, including car parking and amenities. This will ensure that parking on the beach at Ainsdale does not increase in area and provide an alternative long-term solution to avoiding damage to sensitive habitats which will allow Green Beach to develop.
- 3.158 This impact pathway can therefore be **screened out**.

## Background to Invasive Species

- 3.159 An "invasive species" is a species that is: 1) non-native (or alien) to the ecosystem under consideration, and 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health. They can be introduced to an area by ship ballast water, accidental release, and most often, by people. Invasive species can lead to the extinction of native plants and animals, destroy biodiversity, and permanently alter habitats.
- 3.160 Marine species are introduced to new environments by several means including transport in ships ballast water, biofouling on ships hulls, accidental introductions through aquaculture and by attachment to floating debris in the ocean. Many organisms will find their new environment hostile and will die off but some will thrive, often due to a lack of natural predators in the new environment, and spread to form new populations elsewhere.
- 3.161 Liverpool Docks is known to host several species of Marine invasive non-native species (Japanese skeleton shrimp, *Caprella mutica* and seaweed species *Undaria pinnatifida*). The Dee Estuary has also recorded Chinese mitten crab *Erocheir sinensis* - all of which can spread to the site and affect roosting or feeding habitat (e.g. through competition with native species on which the birds depend).

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<sup>132</sup> [BOTANICAL SURVEY \(sustainablebeach.org.uk\)](https://www.sustainablebeach.org.uk)

3.162 Global trading policies have the potential to increase the volume of freight vessels entering the Docks which in turn could lead to the introduction of invasive species.

## Conclusion

3.163 Untreated ballast water is one of the major sources of introduced species. Since September 2017 ships have been required to manage their ballast water to remove, render harmless or avoid the uptake or discharge of aquatic organisms under the International Maritime Organization's Ballast Water Convention.

3.164 Under the Convention, all ships in international traffic are required to manage their ballast water and sediments to a certain standard, according to a ship-specific ballast water management plan. All ships will also have to carry a ballast water record book and an international ballast water management certificate.

3.1 This impact pathway can therefore be **screened out**.

## Summary of Impact Pathways to be Taken Forward

3.2 Table 7 provides a summary of the impact pathways that have been **screened in** and lists the European sites relevant to those pathways.

**Table 7. Impact pathways and relevant European sites**

Impact pathway screened in	Relevant European site(s)
<p><b>Recreational Pressure/ Public Access/ Disturbance</b></p> <p>A buffer of 7km for recreational pressure has been determined for recreational pressure within the Combined Authority region through visitor studies undertaken by several authorities. Residential developments within and surrounding Combined Authority area would be determined to have a Likely Significant Effect (in the absence of mitigation) should they fall within 7km of a European site.</p>	<ul style="list-style-type: none"> <li>• Mersey Estuary SPA/ Ramsar</li> <li>• Mersey Narrows and North Wirral Foreshore SPA/ Ramsar</li> <li>• Dee Estuary SPA/ Ramsar</li> <li>• Dee Estuary SAC</li> <li>• Sefton Coast SAC</li> <li>• Ribble and Alt Estuaries SPA/ Ramsar</li> <li>• Liverpool Bay/ Bae Lerwpl SPA</li> <li>• Martin Mere SPA/ Ramsar</li> </ul>
<p><b>Disturbance (construction/ operation)</b></p> <p>An analysis of predicted noise levels compared to the baseline will not be possible until planning applications are being developed and details of construction methods and timetables are available. However, for the purposes of flagging those broad locations for growth where the risk of disturbance and probable need for mitigation is greatest a 500m buffer zone is considered reasonable to use at this stage in order to be precautionary.</p>	<ul style="list-style-type: none"> <li>• Sefton Coast SAC</li> <li>• Dee Estuary SAC</li> <li>• Dee Estuary SPA/ Ramsar</li> <li>• Manchester Mosses SAC</li> <li>• Halkyn Mountain/ Mynydd Helygain SAC</li> <li>• Deeside and Buckley Newt Sites SAC</li> <li>• Oak Mere SAC</li> </ul>
<p><b>Atmospheric Pollution</b></p> <p>A 200m buffer has been utilised to identify potential risk of localised (rather than dispersed) effects on air quality applicable to all European sites where air quality is a priority issue currently affecting or threatening the condition of a feature of the site.</p> <p>The 200m zone is well evidenced, based on monitoring data, and is in line with the standard approach in Design Manual for Roads and Bridges and will certainly cover the zone along each relevant road where traffic pollution will be most elevated.</p>	<ul style="list-style-type: none"> <li>• Mersey Estuary SPA/ Ramsar</li> <li>• Mersey Narrows and North Wirral Foreshore SPA/ Ramsar</li> <li>• Dee Estuary SPA/ Ramsar</li> <li>• Sefton Coast SAC</li> </ul>
<p><b>Loss of Functionally Linked Habitat</b></p> <p>Due to the highly mobile nature of waterfowl the boundaries of the European designations are not necessarily enough to ensure the continued favourable conservation status of these species. The wider area around these designations can support (i.e., through foraging and roosting) populations of species for which the European</p>	<ul style="list-style-type: none"> <li>• Mersey Estuary SPA/ Ramsar</li> <li>• Mersey Narrows and North Wirral Foreshore SPA/ Ramsar</li> <li>• Dee Estuary SPA/ Ramsar</li> <li>• Sefton Coast SAC</li> </ul>

**Impact pathway screened in**

**Relevant European site(s)**

sites are designated and therefore, this functionally linked land has to be taken into consideration when assessing the impacts of a Plan on species for which European sites are designated. Each species may have a different zone of influence and these are discussed for avian sites within Table 6.

- Ribble and Alt Estuaries SPA/ Ramsar
- Liverpool Bay/ Bae Lerwpl SPA
- Martin Mere SPA/ Ramsar

**Water Quality**

An 8 km buffer has been used to identify potential risk of water pollution applicable to all European sites where water quality is a priority issue currently affecting or threatening the condition of a feature of the site.

- Mersey Estuary SPA/ Ramsar
- Mersey Narrows and North Wirral Foreshore SPA/ Ramsar
- Dee Estuary SAC
- Dee Estuary Ramsar SPA/ Ramsar
- Ribble and Alt Estuaries SPA
- Liverpool Bay/ Bae Lerwpl SPA

**Renewable Energy – turbines**

The Natural England document 'Impact Risk Zones Guidance Summary Sites of Special Scientific Interest Notified for Birds Version 1.1' (dated March 2019) identifies that for SSSIs designated for wintering waterfowl and waders other than golden plover and lapwing) a maximum of 2km is appropriate for the identification of potential functionally-linked land for development with the exception of wind energy (3km); other impact buffers will be species specific.

- Mersey Estuary SPA/ Ramsar
- Mersey Narrows and North Wirral Foreshore SPA/ Ramsar
- Dee Estuary SPA/ Ramsar
- Ribble and Alt Estuaries SPA/ Ramsar
- Liverpool Bay/ Bae Lerwpl SPA

**Renewable Energy – hydroelectricity**

No buffer as yet as project development is in its initial stages.

- Mersey Estuary SPA/ Ramsar
- Mersey Narrows and North Wirral Foreshore SPA/ Ramsar
- Dee Estuary SPA/ Ramsar
- Ribble and Alt Estuaries SPA/ Ramsar
- Sefton Coast SAC
- Liverpool Bay/ Bae Lerwpl SPA
- River Dee and Bala Lake, Afon Dyfrdwy a Llyn Tegid SAC

**Global Trade**

The Natural England document 'Impact Risk Zones Guidance Summary Sites of Special Scientific Interest Notified for Birds Version 1.1' (dated March 2019) identifies that for SSSIs designated for wintering waterfowl and waders other than golden plover and lapwing) a maximum of 2km is appropriate for the identification of potential functionally-linked land for development with the exception of airports (10km).

- Mersey Estuary SPA/ Ramsar
- Mersey Narrows and North Wirral Foreshore SPA/ Ramsar
- Dee Estuary SPA/ Ramsar
- Sefton Coast SAC
- Ribble and Alt Estuaries SPA/ Ramsar
- Liverpool Bay/ Bae Lerwpl SPA
- Manchester Mosses SAC

Source: <Source>

## 4. Test of Likely Significant Effects (ToLSEs)

### Introduction

- 4.1 When seeking to identify relevant European sites, consideration has been given primarily to identified impact pathways and the source-pathway-receptor approach, rather than adopting a purely ‘zones’-based approach. The source-pathway-receptor approach is a standard tool in environmental assessment. In order for an effect to occur, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism means there is no possibility for an effect to occur. Furthermore, even where an impact is predicted to occur, it may not result in significant effects (i.e., those which undermine the conservation objectives of a European site). Briefly defined, pathways are routes by which a change in activity can lead to a significant effect upon a European site.
- 4.2 The likely zone of impact (also referred to as the likely ‘zone of influence’) of a plan or project is the geographic extent over which significant ecological effects are likely to occur. The zone of influence of a plan or project will vary depending on the specifics of a particular proposal and must be determined on a case-by-case basis with reference to a variety of criteria, including:
- the nature, size / scale and location of the plan;
  - the connectivity between the plan and European sites, for example through hydrological connections or because of the natural movement of qualifying species;
  - the sensitivity of ecological features under consideration; and,
  - the potential for in-combination effects.

### Housing Needs

- 4.3 The current baseline for new housing within the LCR between 2021 – 2040 is a minimum of 83,600 new homes<sup>133</sup>. Table 8 shows the residual housing need 2021 – 2040.

**Table 8. Residual Housing Land Requirement 2021 – 2040**

Housing Requirements	Number of dwellings
Liverpool City Region housing requirement (19 years from 1 Apr 2021 to 31 Mar 2040) at average of 4400 per year	83,600
Net completions (from 1 Apr 2021 to 31 March 2022)	4,616
Residual requirement over SDS plan period from 1 April 2021 to 31 March 2040	78,984

Source: LCRCRA

- 4.4 Table 9 shows the committed housing supply by Local Authority Area (LAA).

**Table 9. LCR Committed Housing Supply 2021-2040 by Local Authority Area**

Committed housing supply (to 2040)	Halton	Knowsley	Liverpool	Sefton	St Helens	Wirral	LCR
	8,402	7,820	29,524	11,457	7,781	11,285	<b>76,269</b>

Source: LCR Strategic Housing and Employment Land Study (SHELS) 2023

- 4.5 The committed supply of 76,269 dwellings across the city region (as of April 1st 2021) has been identified through a Strategic Housing and Employment Land Supply study (SHELS, 2023). This supply is made up of the following:
- Local Plan (adopted and emerging) allocations

<sup>133</sup> Based on The Liverpool City Region Strategic Housing Economic Development Needs Assessment (HEDNA) (2023)

- Outline consents
  - Detailed permissions
  - Windfall (varies by LPA)
  - Small sites (<10 units) contribution (varies by LPA)
- 4.6 This committed supply is considered to capture the significant level of planned growth in the city region up until 2040. It reflects the fact that the SDS plan period overlaps considerably with existing Local Plans, which themselves set out housing provision for their respective areas including allocations and have already been subject to their own HRAs.
- 4.7 There is a supply shortfall of approx. 2,715 dwellings that will need to be provided for and identified by the SDS to meet the 83,600 requirement. It is effectively this growth (that which is not already allocated or allowed for in existing adopted Local Plans) that will be the additional growth attributable to the SDS. Therefore most of the impact of growth in the Liverpool City Region over the SDS period has already been assessed in the various Local Plan HRAs, alone and in combination with each other.**
- 4.8 To meet this requirement of a further 2,715 dwellings, evidence (e.g. various Strategic Housing Land Availability Assessments – ‘SHLAA’s) indicates that there is a further potential supply of 25,080 dwellings up to 2040 that are not/ yet to be committed. These ‘non-committed sites’ are sites that have the potential for housing development and have been identified in the constituent local authorities’ most recent housing evidence base documents. These sites are not allocations or proposed allocations in existing or emerging Local Plans and they do not have planning permission or a resolution to grant planning permission. These sites include sites that have previously benefited from a planning permission but which has since expired, known vacant and derelict land, surplus public sector land, vacant buildings potentially suitable for conversion, land in non-residential use which may have redevelopment potential and other sites identified from visual surveys/site visits and local knowledge. Table 10 shows the potential non-committed housing supply by LA area.

**Table 10. LCR Indicative Potential Non-Committed Housing Supply 2021-2040**

LCR Local Authority	Potential Indicative Non-Committed Supply (dwellings)
Halton	692
Knowsley	161
Liverpool	15,969
Sefton	2,952
St Helens	1,665
Wirral	2,069
<b>LCR Total</b>	<b>25,080</b>

Source: These figures are indicative only as they are based on a headline assessment of the LCR local authority’s housing evidence base documents in summer 2023.

- 4.9 In order to accommodate these housing needs, a range of sites will need to come forward. These will range from smaller sites delivering a limited individual quantum of units, to larger sites such as the strategic housing sites, shown in Table 11 and Figure 5, that will deliver much more units. Note that the majority of these sites are already allocated in Local Plans in the Liverpool City Region.

**Table 11. LCR Strategic Housing Sites**

LCR Ref	Site	Indicative capacity	Site area (ha)
SH1	Daresbury	1,476	75.9
SH2	Sandymoor	1,424	65.9
SH3	North East Widnes	1,155	56.3
SH4	Halebank	538	25.3
SH5	East of Halewood	2,035	56.1



LCR Ref	Site	Indicative capacity	Site area (ha)
SH6	South Whiston (Halsnead Garden Village)	1,585	79.5
SH7	Cherryfield Drive	819	8.8
SH8	Land at Leeds St / Lanyork Road	742	0.8
SH9	Liverpool Waters	5,960	28.0
SH10	Scotland Rd/ Bevington Bush/Nicholas St	614	0.8
SH11	Former International Garden Festival Site	1,374	49.1
SH12	Brunswick Quay	552	1.0
SH13	Northern Dock	1,796	15.0
SH14	Land at Aintree University Hospital	500	8.9
SH15	Freemasons Row	656	0.5
SH16	George St Development Area	1,008	1.5
SH17	Crowland Street	500	25.8
SH18	East of Maghull	1,807	85.8
SH19	Town Lane	661	14.2
SH20	Land at Florida Farm	522	17.4
SH21	Bold Garden Village	690 <sup>134</sup>	99.7
SH22	Garton's Lane	569	16.3
SH23	Cowley Hill	742 <sup>135</sup>	31.1
SH24	Moss Nook	802	20.1
SH25	Land at Hind Street, Tranmere	1,400	14.7
SH26	Wirral Waters	3,234	12.7
SH27	Former D1 Oils Dock	1,225	23.5
<b>TOTAL</b>		<b>34,377</b>	<b>834</b>

Source: LCRC

<sup>134</sup> Total indicative capacity is 2,988

<sup>135</sup> Total indicative capacity is 1,100



Figure 5. Strategic Housing Sites (Source: LCRCA)

## Employment Land Need

- 4.10 The Liverpool City Region Plan for Prosperity (2022) provides the framework for the Combined Authority's future economic priorities and investment decisions up to 2035. The vision is to deliver a fairer, stronger, cleaner Liverpool City Region with a particular focus on three priority economic clusters: advanced manufacturing, health and life sciences, and digital and creative. Building on the platform set in the Plan for Prosperity, the Combined Authority is also currently preparing an Economic Opportunities Framework which will develop the economic value proposition of the three growth priority clusters with an ultimate objective being to unlock growth at scale.
- 4.11 A major part of delivering the Plan for Prosperity and creating a stronger and more sustainable economy, will be the provision of the right amount and type of employment land. 'Employment land' in this instance refers to those uses falling within offices and light industrial (use class E (g) (iii)) industrial and manufacturing (use class B2) and warehousing and distribution (use class B8) also referred to as logistics.
- 4.12 The Liverpool City Region Strategic Housing Economic Development Needs Assessment (HEDNA) (2023) identifies an employment land need across the LCR for general industrial uses of 521ha, and for office and research and development uses of 281, 600 sqm from 2021 up to 2040.
- 4.13 Table 12 shows the minimum employment land required for general industrial uses by LAA.

Table 12. Minimum Employment land required for general industrial uses over the period 2021-2040

LCR Local Authority	General Industrial Employment Land Requirement (Hectares)
Halton	95.9

LCR Local Authority	General Industrial Employment Land Requirement (Hectares)
Knowsley	107.0
Liverpool	123.7
Sefton	42.3
St Helens	111.5
Wirral	40.3
<b>LCR Total</b>	<b>520.7</b>

Source: LCRCA

4.14 Table 13 shows the minimum employment land required for office and research and development uses by LAA.

**Table 13. Minimum Employment land required for office and research and development uses over the period 2021-2040**

LCR Local Authority	Floorspace Requirement for Office (sq.m)	Floorspace Requirement for Research and Development (sq.m)
Halton	8,200	8,700
Knowsley	28,300	9,200
Liverpool	129,000	53,200
Sefton	2,900	3,800
St Helens	9,400	3,400
Wirral	17,300	8,200
<b>LCR Total</b>	<b>195,100</b>	<b>86,500</b>

4.15 In order to meet these employment land needs a range of strategic sites have been identified. These sites, shown in Table 14 and Figure 6, should be protected for employment use in accordance with national and local policy.

**Table 14. LCR Strategic Employment Sites**

Site Reference	Site Name
LCRSE1	The Heath Business Park
LCRSE2	Sci-Tech Daresbury
LCRSE3	West Runcorn (incl. Ineos, INOVYN), Halton
LCRSE4	3MG
LCRSE5	Knowsley Industrial and Business Parks
LCRSE6	Jaguar Land Rover
LCRSE7	Land South of M62, Knowsley
LCRSE8	Liverpool CBD
LCRSE9	Knowledge Quarter
LCRSE10	Atlantic Business Park
LCRSE11	East of Maghull
LCRSE11	Omega South
LCRSE13	Parkside East <sup>136</sup>

<sup>136</sup> Note as set out in St Helens Local Plan Policy LPA03, Parkside East site has a gross area of approximately 125ha, of which at least 60ha is reserved for development of a Strategic Rail Freight Interchange or other rail enabled use (see St Helens Local Plan Policy LPA09). The indicative site area of 64.55ha represents the remainder of the site which may be developed for a wider range of employment.

Site Reference	Site Name
LCRSE14	Parkside West
LCRSE15	Haydock Industrial Estate
LCRSE16	Glass Futures
LCRSE17	Northside
LCRSE18	Wirral Waters

Source: LCRCA

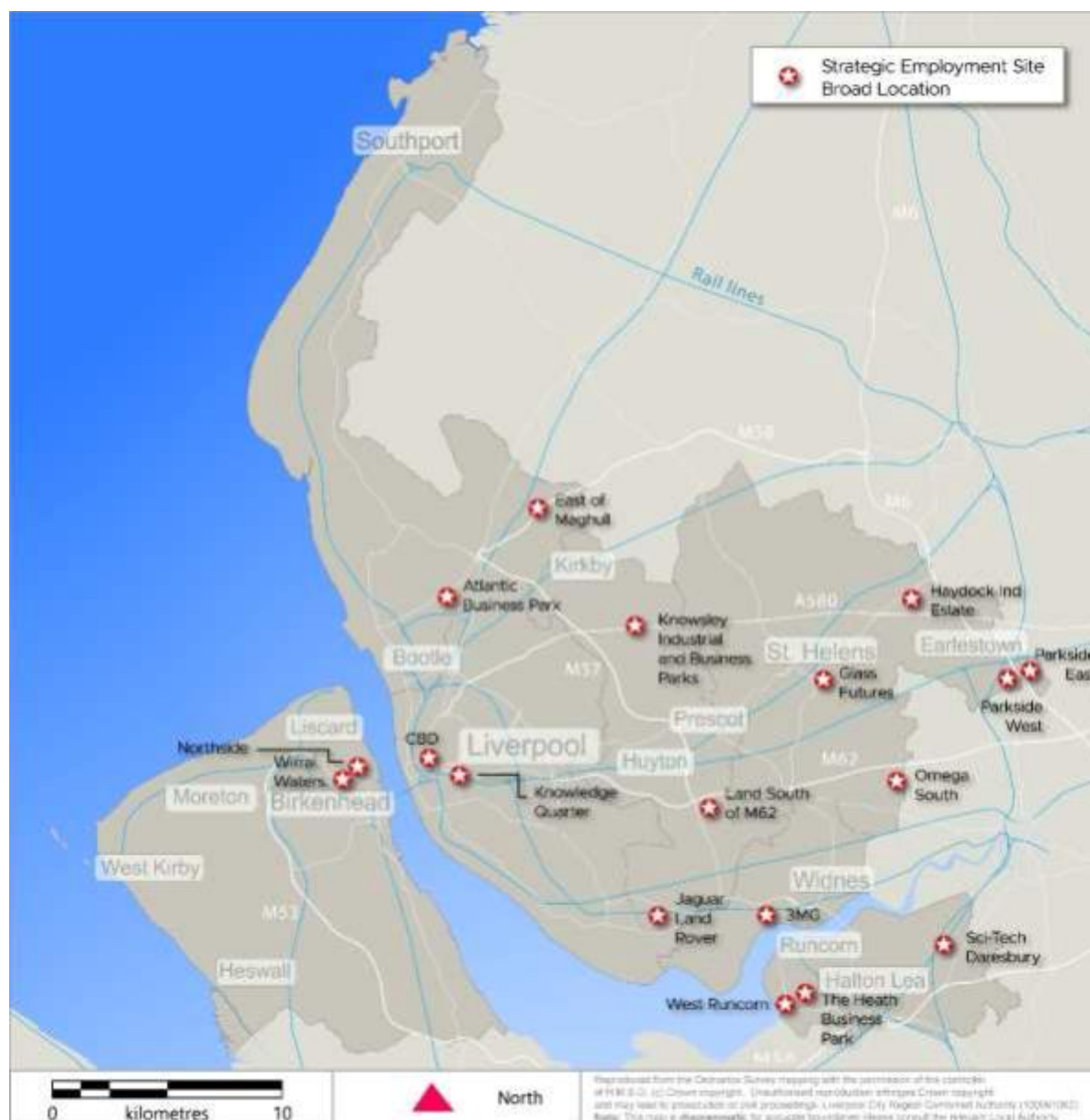


Figure 6. Strategic Employment Sites (Source: LCRCA)

## Approach to Policy Screening

- 4.16 Based on guidance published by NatureScot<sup>137</sup>, policies were screened out of having likely significant effects on a European site where any of the following reasons applied:
- they are environmentally positive;
  - they will not themselves lead to any development or other change;
  - they make provision for change but could have no conceivable effect on a European site. This can be because there is no pathway between the policy and the qualifying features or a European site, or because any effect would be positive;
  - they make provision for change but could have no significant effect on a European site (i.e., the effect would not undermine the conservation objectives of a European site); or,
  - the effects of a policy on any particular European site cannot be ascertained because the policy is too general. For example, a policy may be screened out if, based on absence of detail in the policy, it is not possible to identify where, when, or how the policy may be implemented, where effects may occur, or which sites, if any, may be affected.
- 4.17 Any 'criteria-based' policy (i.e., those that simply list criteria with which development needs to comply) or other general policy statements that have no spatial element were also screened out. Likewise, policies that simply 'safeguard' an existing resource (e.g., existing green infrastructure or mineral resources) by preventing other incompatible development, were also screened out.
- 4.18 The appraisal therefore focussed on those policies with a definable spatial component. Having established which policies required scrutiny by virtue of being spatially defined, consideration was given as to whether likely significant effects could be dismissed due to a lack of connectivity to any European site for one of the following reasons:
- a potentially damaging activity may occur as a result of the policy but there is no pathway connecting it to a European site (due to distance, for example);
  - there are no European sites vulnerable to any of the activities that the policy will deliver; or,
  - the policy will not result in any damaging activities.

## Results of Policy Screening

- 4.19 The results of the ToLSEs arising from the policies of the SDS are presented in Appendix C, Table C.1. Where a policy is shaded green, there are no linking impact pathways to European sites and LSEs can be excluded. Where the screening outcome is shaded orange, LSEs cannot be excluded and the policy is screened in for Appropriate Assessment.
- 4.20 Of the 27 SDS Policies, six policies were considered to have the potential to result in likely significant effects either alone or in combination with other plans and projects:
- Policy LCR SP1 – Strategic Housing Need and Distribution
  - Policy LCR SP2 – Strategic Employment Land Need and Distribution
  - Policy LCR SP4 - Strategic Infrastructure
  - Policy LCR SP5 - City and Town Centres
  - Policy LCR SP7 - International Connectivity
  - Policy LCR SP8 - River Mersey and the Coast

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<sup>137</sup> SNH (2015). Habitats Regulations Appraisal of Plans: Guidance for Plan-Making Bodies in Scotland. Version 3.0, January 2015. Available from: <https://www.nature.scot/habitats-regulations-appraisal-plans-guidance-plan-making-bodies-scotland-jan-2015>.

## 5. In-Combination Assessment

### Local Plans

- 5.1 The delivery of at least 76,269 dwellings to 2040 across the Combined City Region will result in the potential for a range of likely significant effects on the European sites surrounding the region. This is in addition to the 4,998 in Cheshire West & Chester Council; 3,451 in Flintshire and c. 190,000 dwellings proposed across both the Greater Manchester Combined Authority (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) in the Places for Everyone plan 2022-2039<sup>138</sup> and in the Local Plans for Warrington and West Lancashire.
- 5.2 Impact pathways with potential interactions are varied and include recreational pressure, loss of functionally linked habitat for SPAs/ Ramsars, water level, water quality, coastal squeeze, and visual and noise disturbance. The potential for interactions largely depends on the specific location and nature of the proposed development in relation to European sites. Taking public access/ disturbance as an example, Local Plans have the potential to result in increased visitor numbers to European sites due to an increase in housing.

### Coastal Plans

- 5.3 Shoreline Management Plans provide a policy context for shoreline/coastal zone management and development. As acknowledged throughout this document, Shoreline Management Plans and the Coastal Strategies that result from them often result in adverse effects on the integrity of European sites through a combination of coastal squeeze, loss of functionally-linked land for SPA/Ramsar birds, direct habitat loss due to defence footprint and changes to long-shore sediment transport and other aspects of natural sediment dynamics. They also present opportunities for positive effects on European sites if opportunities for managed realignment are included that will enable a more natural coastline to be established.
- 5.4 The following Shoreline Management Plan applies to the Liverpool City Region and was considered for in-combination impacts:
- SMP 22 Great Ormes Head to Scotland
- 5.5 The assessments for any potential in-combination impacts between these plans and policies contained within the SDS were considered with regards to spatial proximity and/or hydrological and/or hydrographical connectivity. In-combination likely significant effects were identified in respect of Policies LCR SP4 - Strategic Infrastructure; LCR SP7 - International Connectivity and LCR SP8 - River Mersey and the Coast.

### Water Resource Management Plans

- 5.6 United Utilities and Dŵr Cymru Welsh Water have produced Water Resources Management Plans. These set out the water supply strategy for their areas and could therefore have negative effects on European sites in their own right. For example, the Lake District is a major supply source for United Utilities and includes Haweswater as a principal reservoir. Haweswater is within the catchment of the River Eden SAC.
- 5.7 However, Water Resources Management Plans are required to have their own HRAs undertaken. The HRAs for each of the latest adopted WRMPs considered whether their future supply strategy to meet water needs would affect European sites and it was concluded that the supply needs of their areas could be met without an adverse effect on the integrity of European sites, primarily through a combination of improved water efficiency measures and bringing new water supply areas into consideration that do not result in increased abstraction from European sites. As such, there would be no in combination effect with the SDS.
- 5.8 In addition to the WRMP, United Utilities have also produced a Drainage and Wastewater Management Plan (DWMP) 2023<sup>139</sup>, the HRA of which states *“Therefore the HRA can conclude that the DWMP (if adopted as proposed) will have no adverse effects on the integrity of any European sites, subject to appropriate consideration of residual uncertainties ‘down the line’ through the design and planning process and, ultimately, at project level. To ensure this, the DWMP includes an explicit requirement for the potential*

<sup>138</sup> [Microsoft Word - Composite PFE Plan\\_SEP2023.docx \(greatermanchester-ca.gov.uk\)](#)

<sup>139</sup> [https://www.unitedutilities.com/globalassets/z\\_corporate-site/about-us-pdfs/dwmp-2023/dp1-main-document.pdf](https://www.unitedutilities.com/globalassets/z_corporate-site/about-us-pdfs/dwmp-2023/dp1-main-document.pdf)

*effects on European sites to be considered at every design and planning stage for each option (and their component schemes), to ensure that potential adverse effects are identified and avoided during the design process.*<sup>140</sup>

- 5.9 Dŵr Cymru Welsh Water have also prepared a DWMP<sup>141</sup>, which again was subject to its own HRA that concluded “*the WRMP will have no adverse effects, alone or in combination, on any European sites*”<sup>142</sup>.
- 5.10 It is also noted that at the time of writing this report, Dŵr Cymru Welsh Water have prepared a revised Draft WRMP 2024<sup>143</sup>, the HRA of which states “*Therefore it can be concluded that the WRMP (if adopted as drafted) will have no adverse effects, alone or in combination, on the integrity of any European sites.*” However, this plan has not yet been published and therefore cannot be included in this assessment.

## Drought Plan Permits and Orders

- 5.11 The Liverpool City Region encompasses European sites that are sensitive to a wide range of anthropogenic pressures, including hydrology, water quality, recreational pressure, coastal squeeze and others. Multiple simultaneously acting impacting pathways can compound negative impacts on qualifying habitats and species.
- 5.12 For example, water companies, under their duty of delivering potable water to households and businesses, can apply for drought permits, enabling them to abstract water beyond existing abstraction consents for an agreed period of time. Granting of drought periods has the potential for negative environmental impacts, particularly on European sites that are already subject to existing unfavourable flow conditions or water levels. Inadequately planned or sited natural flood management and hard defence structures have the potential to negatively interact with Environment Agency Drought Orders and water company Drought Permits.
- 5.13 Drought conditions will also impose further pressures on designated sites such as by reducing water quality (reduced flows would typically result in higher nutrient concentrations, exacerbating the impact of treated sewage effluent) and water flow. In addition, climate change has the potential to increase the frequency and severity of drought conditions. Drought Plan Orders and Permits would compound drought issues and operate in-combination with impact pathways associated with the SDS. However, drought plans will generally only operate at times of low water levels and low rainfall.
- 5.14 Notwithstanding this, Drought Plans of water companies are subject to their own assessment process including HRA. This ensures that potential adverse effects on the integrity of European sites are adequately mitigated or, where this cannot be achieved, suitable compensation is provided. Overall, given that the Drought Plans of water companies undergo robust HRA appraisal, no in-combination effects with the SDS will occur.

## Northern Powerhouse Strategy

- 5.15 The Northern Powerhouse is a government-backed initiative to help improve the economic prospects of Northern cities. The project combines the Northern Powerhouse Investment Fund, the Northern Powerhouse Partnership, the European Regional Development Fund and Local Enterprise Partnerships (LEPS) and aims to build on manufacturing, pharmaceuticals, energy and digital technology.
- 5.16 As with Local Plans, impact pathways with potential interactions are varied and include loss of functionally linked habitat for SPAs/ Ramsars, water level, water quality, coastal squeeze, and visual and noise disturbance. The potential for interactions largely depends on the specific location and nature of the proposed development in relation to European sites.

## Liverpool Waters

- 5.17 This project is the development of currently run-down dockland areas on the eastbank of the River Mersey. This includes the construction of houses, retail and commercial developments. The construction of these

<sup>140</sup> [https://www.unitedutilities.com/globalassets/z\\_corporate-site/about-us-pdfs/dwmp-2023/c005-dwmp-habitat-regulation-assessment-hra-report.pdf](https://www.unitedutilities.com/globalassets/z_corporate-site/about-us-pdfs/dwmp-2023/c005-dwmp-habitat-regulation-assessment-hra-report.pdf)

<sup>141</sup> <https://www.dwrcymru.com/en/our-services/water/water-resources/final-water-resources-management-plan-2019>

<sup>142</sup> Ibid

<sup>143</sup> <https://www.dwrcymru.com/en/our-services/water/water-resources/draft-water-resources-management-plan-2024>

two developments will have a direct impact on the Mersey Narrows and North Wirral Foreshore SPA due to loss of habitat, barrier impacts for birds in flight and significant disturbance issues during construction. Liverpool Waters has planning permission and was subject to its own HRA.

## Liverpool 2

- 5.18 This includes the Port expansion into Seaforth Nature Reserve and the Seaforth River Terminal (a deep-water container port expansion in the borough of Sefton is currently under construction and due for completion imminently), new opportunities for renewable energy, development of single and multi-user port centric warehousing and of new processing facilities for imported commodities potentially leading to the Liverpool SuperPort - An integrated port, airport, intermodal terminal, freight and commercial network based upon the Port of Liverpool, the Manchester Ship Canal, Liverpool John Lennon Airport and the Mersey Multimodal Gateway (Liverpool City Region). Dredging in the Mersey approach channel began in 2014 and was subject to its own HRA.

## Liverpool John Lennon Airport Master Plan

- 5.19 The expansion of the Liverpool John Lennon Airport is an explicit element of national government policy as set out in the White Paper 'The Future of Air Transport' (2003). The 'Liverpool John Lennon Airport Master Plan to 2050' (March 2018) shows how the Airport intends to respond to the White Paper's objectives and involves the construction of new terminal facilities, with additional car-parking, as well as new cargo handling and aircraft maintenance facilities, a mixed-use development and hotel.
- 5.20 A Shadow HRA to support the Liverpool John Lennon Airport development has been produced by Peel Airports. While the Shadow HRA itself has no formal status within the Liverpool Local Plan process and has not been subject to consultation with Natural England, it does present additional evidence regarding bird surveys and use of the Oglet. It is understood further seasons of survey to inform emerging planning applications are being discussed.

## Mersey Tidal Power Project

- 5.21 The Mersey Tidal Power Project is in early stage development (Pre-Scoping) with a considered timeline for achieving operations in the 2030s. At a scale of at least 1 Giga-Watt, it offers a significant new tidal generating asset that can be realistically deployed to harness the abundant marine power in the Liverpool City Region for generations to come.
- 5.22 The large scale, low carbon generation project providing over 1 TWh of annual generation has the potential to be one of the largest embedded generation projects in the North West, providing 30% of regional demand at a time when other large assets are retiring.
- 5.23 Engagement continues with Environmental Stakeholders. Officers have been engaged in 1-2-1 meetings with Statutory Environmental stakeholders and associated interested parties to discuss the nominal locations for a scheme and the scope and extent of surveys that will be required to collect data and evidence as part of the preparation of an Environmental Impact Assessment (EIA) and to consider Habitat Regulations Assessment (HRA). There have also been a series of technical workshops around hydro-environmental modelling with statutory environmental stakeholders and presentations on bird survey findings.



## 6. Next Steps

### Introduction

- 6.1 The impact pathways relating to each European Site and Scenario shown in Table 4 will be explored further at the next stage of the Habitats Regulations Assessment the Appropriate Assessment. Below is a brief summary of what this stage will include.
- 6.2 Stage 2 – Appropriate Assessment. Where it is determined that a conclusion of ‘no Likely Significant Effect’ cannot be drawn, the analysis will proceed to the next stage of HRA known as Appropriate Assessment. Case law has clarified that ‘Appropriate Assessment’ is not a technical term. In other words, there are no particular technical analyses, or level of technical analysis, that are classified by law as belonging to appropriate assessment rather than determination of likely significant effects. Appropriate Assessment refers to whatever level of assessment is appropriate to form a conclusion regarding effects on the integrity (coherence of structure and function) of European sites in light of their conservation objectives.
- 6.3 By virtue of the fact that it follows the Likely Significant Effects Test process, there is a clear implication that the analysis will be more detailed than undertaken at the previous stage. 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 would take any policies that could not be dismissed following the high-level Likely Significant Effects Test analysis and assess the potential for an effect in more detail, with a view to concluding whether there would actually be an adverse effect on site integrity (in other words, disruption of the coherent structure and function of the international site(s)).
- 6.4 Also, in 2018 the Holohan ruling<sup>144</sup> was handed down by the European Court of Justice. Among other provisions paragraph 39 of the ruling states that ‘*As regards other habitat types or species, which are present on the site, but for which that site has not been listed, and with respect to habitat types and species located outside that site, ... typical habitats or species must be included in the appropriate assessment, if they are necessary to the conservation of the habitat types and species listed for the protected area*’ [emphasis added].
- 6.5 Where necessary, measures will be recommended for incorporation into the SDS in order to avoid or mitigate adverse effects on European sites. There is considerable precedent concerning the level of detail that a Plan document needs to contain regarding mitigation for recreational impacts on European sites. The implication of this precedent is that it is not necessary for all measures that will be deployed to be fully developed prior to adoption of the Plan, but the Plan must provide an adequate policy framework within which these measures can be delivered. Sufficient detail needs to be provided to enable the determination that mitigation is likely to be achievable, to set the parameters for what that mitigation is likely to involve, and to provide safeguards that development will not come forward if this cannot be implemented.
- 6.6 In evaluating significance, AECOM will rely on professional judgement as well as the results of bespoke studies, supported by appropriate evidence/ data, and previous stakeholder consultation regarding development impacts on the European sites considered within this assessment.
- 6.7 Once the Appropriate Assessment is complete, its recommendations and associated mitigation strategies will then be expanded upon and factored into individual Combined Authority Local Plans who would then undertake more detailed assessments. The HRA of the SDS would seek to define the recommended parameters of that down-the-line assessment for Local Plans, taking care to ensure that anything identified at the SDS level can be taken on board in Local Plans and their HRAs.
- 6.8 A summary of policies to be taken through to Appropriate Assessment are shown in Table 9.

**Table 15. Policies to be taken through to Stage 2**

	Potential impact pathway(s)	Relevant European site(s)
Policy		

<sup>144</sup> Case C-461/17

	Potential impact pathway(s)	Relevant European site(s)
Policy LCR SP1 – Strategic Housing Need and Distribution	Recreational Pressure/ Public Access/ Disturbance  Atmospheric Pollution  Loss of Functionally Linked Habitat  Water Quality	Mersey Estuary SPA/ Ramsar  Mersey Narrows and North Wirral Foreshore SPA/ Ramsar  Dee Estuary SPA/ Ramsar  Dee Estuary SAC
Policy LCR SP2 – Strategic Employment Land Need and Distribution	Disturbance  Atmospheric Pollution  Loss of Functionally Linked Habitat  Water Quality	Sefton Coast SAC  Ribble and Alt Estuaries SPA/ Ramsar  Liverpool Bay/ Bae Lerwpl SPA  Martin Mere SPA/ Ramsar  Manchester Mosses SAC  Halkyn Mountain/ Mynydd Helygain SAC  Deeside and Buckley Newt Sites SAC  Oak Mere SAC
Policy LCR SP4 - Strategic Infrastructure	Disturbance  Atmospheric Pollution  Loss of Functionally Linked Habitat  Water Quality  Renewable Energy – turbines  Renewable Energy - hydroelectricity	Mersey Estuary SPA/ Ramsar  Mersey Narrows and North Wirral Foreshore SPA/ Ramsar  Dee Estuary SAC  Dee Estuary SPA/ Ramsar  Ribble and Alt Estuaries SPA/ Ramsar  Sefton Coast SAC  Liverpool Bay/ Bae Lerwpl SPA  Martin Mere SPA/ Ramsar  River Dee and Bala Lake, Afon Dyfrdwy a Llyn Tegid SAC  Manchester Mosses SAC  Halkyn Mountain/ Mynydd Helygain SAC  Deeside and Buckley Newt Sites SAC  Oak Mere SAC
Policy LCR SP5 - City and Town Centres	Atmospheric Pollution  Water Quality	Mersey Estuary SPA/ Ramsar  Mersey Narrows and North Wirral Foreshore SPA/ Ramsar  Sefton Coast SAC  Dee Estuary SAC  Dee Estuary SPA/ Ramsar

	Potential impact pathway(s)	Relevant European site(s)
		Manchester Mosses SAC Halkyn Mountain/ Mynydd Helygain SAC Deeside and Buckley Newt Sites SAC Oak Mere SAC
Policy LCR SP7 - International Connectivity	Disturbance Atmospheric Pollution Loss of Functionally Linked Habitat Water Quality Global Trade	Mersey Estuary SPA/ Ramsar Mersey Narrows and North Wirral Foreshore SPA/ Ramsar Dee Estuary SPA/ Ramsar Sefton Coast SAC Ribble and Alt Estuaries SPA/ Ramsar Liverpool Bay/ Bae Lerwpl SPA
Policy LCR SP8 - River Mersey and the Coast	Recreational Pressure/ Public Access/ Disturbance Atmospheric Pollution Loss of Functionally Linked Habitat Water Quality Global Trade Renewable Energy – turbines Renewable Energy - hydroelectricity	Mersey Estuary SPA/ Ramsar Mersey Narrows and North Wirral Foreshore SPA/ Ramsar Dee Estuary SPA/ Ramsar Sefton Coast SAC Ribble and Alt Estuaries SPA/ Ramsar Liverpool Bay/ Bae Lerwpl SPA River Dee and Bala Lake, Afon Dyfrdwy a Llyn Tegid SAC

# Appendix A

## A.1 Relevant European Sites

## Mersey Estuary SPA/ Ramsar

### Introduction

6.9 The Mersey Estuary is on the Irish Sea coast of north-west England. The SPA encompasses all or parts of Mersey Estuary SSSI and New Ferry SSSI. It is a large, sheltered estuary which comprises large areas of saltmarsh and extensive intertidal sand and mudflats, with limited areas of brackish marsh, rocky shoreline and boulder clay cliffs, within a rural and industrial environment. The intertidal flats and saltmarshes provide feeding and roosting sites for large and internationally important populations of waterfowl. During the winter, the site is of major importance for duck and waders. The site is also important during spring and autumn migration periods, particularly for wader populations moving along the west coast of Britain.

### SPA Qualifying Features<sup>145</sup>

6.10 The site is designated as a SPA for its:

Qualifying Annex 1 species:

- Golden plover *Pluvialis apricaria*

Migratory species:

- Shelduck *Tadorna tadorna*
- Teal *Anas crecca*
- Pintail *Anas acuta*
- Dunlin *Calidris alpina alpina*
- Black-tailed godwit *Limosa limosa islandica*
- Redshank *Tringa totanus*

Waterbird assemblage: great crested grebe *Podiceps cristatus*, shelduck, wigeon *Anas penelope*, teal, pintail, ringed plover *Charadrius hiaticula*, golden plover, grey plover *Pluvialis squatarola*, lapwing *Vanellus vanellus*, dunlin, black-tailed godwit, curlew *Numenius arquata* and redshank.

### Ramsar Qualifying Features<sup>146</sup>

6.11 The site is designated as a Ramsar site for the following Criteria:

Criterion 5: Assemblages of international importance –

**Species with peak counts in winter:** 89576 waterfowl (5 year peak mean 1998/99-2002/2003)

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

**Qualifying Species/populations (as identified at designation):**

**Species with peak counts in spring/autumn:**

- Shelduck
- Black-tailed godwit
- Redshank

**Species with peak counts in winter:**

- Teal
- Pintail
- Dunlin

<sup>145</sup> [www.publications.naturalengland.org.uk/publication/5790848037945344](http://www.publications.naturalengland.org.uk/publication/5790848037945344)

<sup>146</sup> [www.jncc.gov.uk/jncc-assets/RIS/UK11039.pdf](http://www.jncc.gov.uk/jncc-assets/RIS/UK11039.pdf)

## Conservation Objectives<sup>147</sup>

- 6.12 “With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the ‘Qualifying Features’ listed below), and subject to natural change;
- 6.13 Ensure that 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.”

## Environmental Vulnerabilities

- 6.14 The Site improvement Plan<sup>148</sup> identifies the following pressures and threats to the SPA:
- Changes in species distributions i.e., bird declines
  - Invasive species i.e., Canada goose *Branta canadensis* and Chinese mitten crab *Eriocheir sinensis*
  - Public access/ disturbance
- 6.15 The Information Sheet on Ramsar Sites<sup>149</sup> does not identify any pressures and threats to the Ramsar site.

# Mersey Narrows and North Wirral Foreshore SPA/ Ramsar

## Introduction

- 6.16 Mersey Narrows and North Wirral Foreshore is located on the northwest coast of England at the mouths of the Mersey and Dee estuaries. The SPA/ Ramsar boundary is coincident with the boundaries of North Wirral Foreshore Site of Special Scientific Interest (SSSI) and Mersey Narrows SSSI. The site comprises intertidal habitats at Egremont foreshore, man-made lagoons at Seaforth and the extensive intertidal flats at North Wirral Foreshore. Egremont is most important as a feeding habitat for waders at low tide whilst Seaforth is primarily a high tide roost site, as well as a nesting site for terns. North Wirral Foreshore supports large numbers of feeding waders at low tide and also includes important high tide roost sites.

## SPA Qualifying Features<sup>150</sup>

- 6.17 The site is designated as a SPA for its:

Qualifying Annex I species:

- Bar-tailed godwit *Limosa lapponica*
- Common tern *Sterna hirundo*

Waterbird assemblage: cormorant *Phalacrocorax carbo*, oystercatcher *Haematopus ostralegus*, grey plover, sanderling *Calidris alba*, knot *Calidris canutus*, dunlin, bar-tailed godwit, redshank.

## Ramsar Qualifying Features<sup>151</sup>

- 6.18 The site is designated as a Ramsar site for the following Criteria:

<sup>147</sup> [www.publications.naturalengland.org.uk/publication/5790848037945344](http://www.publications.naturalengland.org.uk/publication/5790848037945344)

<sup>148</sup> [www.publications.naturalengland.org.uk/publication/6273450410770432](http://www.publications.naturalengland.org.uk/publication/6273450410770432)

<sup>149</sup> [www.jncc.gov.uk/jncc-assets/RIS/UK11039.pdf](http://www.jncc.gov.uk/jncc-assets/RIS/UK11039.pdf)

<sup>150</sup> [www.publications.naturalengland.org.uk/publication/6521906232557568](http://www.publications.naturalengland.org.uk/publication/6521906232557568)

<sup>151</sup> [www.rsis.ramsar.org/RISapp/files/RISrep/GB2202RIS.pdf](http://www.rsis.ramsar.org/RISapp/files/RISrep/GB2202RIS.pdf)

Criterion 4: The site regularly supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions e.g., important numbers of non-breeding little gulls *Hydrocoloeus minutus* and common terns.

Criterion 5: Assemblages of international importance. The site regularly supports 20,000 or more waterbirds.

Criterion 6: The site regularly supports 1% of the individuals in the populations of the following species or subspecies of waterbird in any season: *islandica* and *lapponica* sub-species of bar-tailed godwits, non-breeding knot.

## Conservation Objectives<sup>152</sup>

- 6.19 *With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;*
- 6.20 *Ensure that 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.”*

## Environmental Vulnerabilities

- 6.1 The Site improvement Plan<sup>153</sup> (which also covers The Dee Estuary SPA/ Ramsar/ SAC) identifies the following pressures and threats to the SPA:
- Public access/ disturbance
  - Changes in species distributions i.e., petalwort *Petalophyllum ralfsii*
  - Invasive species
  - Climate change
  - Coastal squeeze
  - Water pollution
  - Fisheries: Commercial marine and estuarine
  - Overgrazing
  - Predation of tern colonies
  - Planning permission: general
  - Marine consents and permits
  - Transportation and service corridors
  - Physical modification i.e., impacts of reduced freshwater inputs flushing through the Estuary
- 6.2 The Information Sheet on Ramsar Sites<sup>154</sup> identifies the following pressures and threats to the Ramsar site:
- Unspecific development urban use
  - Recreation/ tourism disturbance
  - Vegetation succession

<sup>152</sup> [www.publications.naturalengland.org.uk/publication/6521906232557568](http://www.publications.naturalengland.org.uk/publication/6521906232557568)

<sup>153</sup> [www.publications.naturalengland.org.uk/publication/6579320399069184](http://www.publications.naturalengland.org.uk/publication/6579320399069184)

<sup>154</sup> [www.rsis.ramsar.org/RISapp/files/RISrep/GB2202RIS.pdf](http://www.rsis.ramsar.org/RISapp/files/RISrep/GB2202RIS.pdf)

# The Dee Estuary/ Aber Dyfrdwy SAC

## Introduction

- 6.3 The Dee Estuary / Aber Dyfrdwy Special Area of Conservation (SAC) includes the Dee Estuary itself and areas of intertidal flats on the north-west coast of the Wirral (North Wirral Foreshore) and on the north east Wales coast, east of Prestatyn (Gronant Dunes and Talacre Warren). Gronant Dunes and Talacre Warren also includes the largest remaining area of a once extensive dune system along this section of Welsh coast.
- 6.4 The SAC has been designated because of its size and biological interest including its saltmarshes, intertidal mudflats and sandflats, sand dunes, drift line vegetation and sea cliffs, the presence of petalwort, and sea lamprey *Petromyzon marinus* and river lamprey *Lampetra fluviatilis* that migrate through the area.
- 6.5 Upstream of an enclosing line across the mouth of the estuary between Point of Ayr (Wales) and Hilbre Point (England), the estuary is the sixth largest in the UK.

## Qualifying Features<sup>155</sup>

- 6.6 The site is designated as a SAC for its:

### Qualifying Annex I habitats:

- Annual vegetation of drift lines
- Atlantic salt meadows
- Embryonic shifting dunes
- Estuaries
- Fixed dunes with herbaceous vegetation ('grey dunes')\*
- Humid dune slacks
- Mudflats and sandflats not covered by seawater at low tide
- Salicornia and other annuals colonising mud and sand
- Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')
- Vegetated sea cliffs of the Atlantic and Baltic coasts

Annex I priority habitats are denoted by an asterisk (\*).

- 6.7 Qualifying Annex II species:

- Petalwort
- River lamprey
- Sea lamprey

## Conservation Objectives<sup>156</sup>

- 6.8 *"With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;*
- 6.9 *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 the habitats of qualifying species*
  - *The structure and function of the habitats of qualifying species*

<sup>155</sup> [www.publications.naturalengland.org.uk/publication/6124489284780032](http://www.publications.naturalengland.org.uk/publication/6124489284780032)

<sup>156</sup> [www.publications.naturalengland.org.uk/publication/6124489284780032](http://www.publications.naturalengland.org.uk/publication/6124489284780032)



- *The supporting processes on which the habitats of qualifying species rely*
- *The populations of qualifying species, and,*
- *The distribution of qualifying species within the site.”*

## Environmental Vulnerabilities

6.10 The Site improvement Plan<sup>157</sup> identifies the following pressures and threats to the SAC:

- Public access/ disturbance
- Changes in species distributions i.e., petalwort
- Invasive species
- Climate change
- Coastal squeeze
- Inappropriate scrub control
- Water pollution
- Fisheries: Commercial marine and estuarine
- Inappropriate coastal management
- Overgrazing
- Direct impact from third party
- Marine litter
- Planning permission: general
- Marine consents and permits
- Wildfire/ arson
- Air pollution: impact of atmospheric nitrogen deposition
- Transportation and service corridors
- Physical modification i.e., impacts of reduced freshwater inputs flushing through the Estuary

## The Dee Estuary SPA/ Ramsar

### Introduction

6.11 The Dee Estuary SPA encompasses the Dee Estuary/Aber Afon Dyfrdwy SSSI; the dunes and intertidal foreshore at Gronant Dunes and Talacre Warren SSSI; the freshwater marsh at Inner Marsh Farm SSSI; and the lagoons and reedbeds at Shotton Lagoons and Reedbeds.

6.12 The site is of major importance for waterbirds; during the winter the intertidal flats, saltmarshes and fringing habitats including coastal grazing marsh/fields, provide feeding and roosting sites for internationally important numbers of ducks and waders; in summer the site supports nationally important breeding colonies of two species of tern. The site is also important during migration periods, particularly for wader populations moving along the west coast of Britain and for sandwich terns *Sterna sandvicensis* post-breeding.

### SPA Qualifying Features<sup>158</sup>

6.13 The site is designated as a SPA for its:

Qualifying Annex I species:

- Bar-tailed godwit

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<sup>157</sup> [www.publications.naturalengland.org.uk/publication/6579320399069184](http://www.publications.naturalengland.org.uk/publication/6579320399069184)

<sup>158</sup> [www.publications.naturalengland.org.uk/publication/6557770283220992](http://www.publications.naturalengland.org.uk/publication/6557770283220992)

- Common tern
- Little tern *Sterna albifrons*
- Sandwich tern

Regular use by the following migratory species (other than those listed in Annex I):

- Redshank (passage and wintering)
- Shelduck (wintering)
- Teal (wintering)
- Pintail (wintering)
- Oystercatcher (wintering)
- Grey plover (wintering)
- Knot (wintering)
- Dunlin (wintering)
- Black-tailed godwit (wintering)
- Curlew *Numenius arquata* (wintering)

Waterbird assemblage: great crested grebe, cormorant *Phalacrocorax carbo*, shelduck, wigeon *Anas penelope*, teal, pintail, oystercatcher, grey plover, lapwing, knot, sanderling, dunlin, black-tailed godwit, bar-tailed godwit, curlew and redshank.

## Ramsar Qualifying Features<sup>159</sup>

6.14 The site is designated as a Ramsar for the following Criteria:

Criterion 1: The site comprises extensive intertidal mud and sand flats (20 km by 9 km) with large expanses of saltmarsh towards the head of the estuary, including Annex I habitats.

Criterion 2: The site supports breeding colonies of the vulnerable natterjack toad, *Epidalea calamita*.

Criterion 5: Assemblages of international importance. In the non-breeding season, the site regularly supports 120,726 individual waterbirds.

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

### **Qualifying Species/populations (as identified at designation):**

#### **Species with peak counts in spring/autumn:**

- Redshank

#### **Species with peak counts in winter:**

- Teal
- Shelduck
- Oystercatcher
- Curlew
- Pintail
- Grey plover
- Knot
- Black-tailed godwit
- Bar-tailed godwit

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<sup>159</sup> [www.jncc.gov.uk/jncc-assets/RIS/UK11082.pdf](http://www.jncc.gov.uk/jncc-assets/RIS/UK11082.pdf)

- Redshank

## Conservation Objectives<sup>160</sup>

- 6.15 “With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the ‘Qualifying Features’ listed below), and subject to natural change;
- 6.16 Ensure that 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.”

## Environmental Vulnerabilities

- 6.17 The Site improvement Plan<sup>161</sup> identifies the following pressures and threats to the SPA:
- Public access/ disturbance
  - Invasive species
  - Climate change
  - Coastal squeeze
  - Water pollution
  - Fisheries: Commercial marine and estuarine
  - Overgrazing
  - Predation of tern colonies
  - Planning permission: general
  - Marine consents and permits
  - Transportation and service corridors
  - Physical modification i.e., impacts of reduced freshwater inputs flushing through the Estuary
- 6.18 The Information Sheet on Ramsar Sites<sup>162</sup> identifies the following pressures and threats to the Ramsar site:
- Introduction/ invasion of exotic animal species i.e., the Chinese mitten crab *Eriocheir sinensis*
  - Introduction/invasion of non-native plant species
  - Overfishing
  - Pollution – industrial waste
  - General disturbance from human activities
  - Transport infrastructure development
  - Sand dune erosion and accretion along North Wales open coast

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<sup>160</sup> [www.publications.naturalengland.org.uk/publication/6557770283220992](http://www.publications.naturalengland.org.uk/publication/6557770283220992)

<sup>161</sup> [www.publications.naturalengland.org.uk/publication/6579320399069184](http://www.publications.naturalengland.org.uk/publication/6579320399069184)

<sup>162</sup> [www.jncc.gov.uk/jncc-assets/RIS/UK11082.pdf](http://www.jncc.gov.uk/jncc-assets/RIS/UK11082.pdf)

# Sefton Coast SAC

## Introduction

- 6.19 Sefton Coast is a large sand dune system (the fourth largest in Britain, Ratcliffe 1977) in north-west England, stretching over 20 km from Southport in the north (at the mouth of the Ribble estuary) and Crosby in the south (at the mouth of the Mersey). The majority of the dune system site lies within the Sefton Coast National Character Area (NCA 57), but at the southern end its landward margin abuts the Merseyside Conurbation NCA (NCA 58). Ravenmeols Hills LNR also lies within Sefton Coast SAC.
- 6.20 Much of the SAC has public access and includes Ainsdale Sand Dunes and Cabin Hill National Nature Reserves and Ainsdale and Birkdale Sandhills Local Nature Reserves. There are 5 championship golf courses within the SAC and a military training camp at Altcar. The remainder of the land is owned and managed by the Wildlife Trust, the National Trust and one private owner. This means that most of the SAC has either full public access or is adjacent to public rights of way. The location, adjacent to the Merseyside conurbation, means that there are areas of high public use (around car parks) and the SAC is already at risk from recreational disturbance. This may increase in magnitude as further developments arise.
- 6.21 The site displays both rapid erosion and active shifting dunes. A substantial stretch of the dune system is fronted by shifting dunes. Marram *Ammophila arenaria* usually dominates the mobile dunes, amidst considerable areas of blown sand. Where rates of sand deposition decline, lyme grass *Leymus arenarius*, sea-holly *Eryngium maritimum* and cat's-ear *Hypochaeris radicata* occur, with red fescue *Festuca rubra* and spreading meadow-grass *Poa humilis* present on the more sheltered ridges. Sea spurge *Euphorbia paralias* and the nationally scarce dune fescue *Vulpia fasciculata* are frequent, while sea bindweed *Calystegia soldanella* is very local. The area of dunes around Formby Point has been eroding since 1906 while areas north and south of this are accreting (where the nature of the coast allows). The rapid erosion is therefore reducing the area of shifting dunes at Formby, and high, steep eroding dunes abut the beach with extensive areas of blown sand immediately inland.

## Qualifying Features<sup>163</sup>

- 6.22 The site is designated as a SAC for its:

### Qualifying Annex I habitats:

- Atlantic decalcified fixed dunes (*Calluno-Ulicetea*). (Coastal dune heathland)\*
- Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*). (Dunes with creeping willow)
- Embryonic shifting dunes
- Fixed dunes with herbaceous vegetation ("grey dunes"). (Dune grassland)\*
- Humid dune slacks
- Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes"). (Shifting dunes with marram)

Annex I priority habitats are denoted by an asterisk (\*).

- 6.23 Qualifying Annex II species:

- Great crested newt *Triturus cristatus*
- Petalwort

## Conservation Objectives<sup>164</sup>

- 6.24 "With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

<sup>163</sup> [www.publications.naturalengland.org.uk/publication/6588974160150528](http://www.publications.naturalengland.org.uk/publication/6588974160150528)

<sup>164</sup> Ibid

6.25 *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 habitats of qualifying species rely*
- *The populations of qualifying species, and,*
- *The distribution of qualifying species within the site.”*

## Environmental Vulnerabilities

6.26 The Site improvement Plan<sup>165</sup> identifies the following pressures and threats to the SAC:

- Coastal squeeze
- Air pollution: risk of atmospheric nitrogen deposition
- Inappropriate scrub control
- Invasive species
- Hydrological changes
- Public access/ disturbance
- Inappropriate coastal management
- Change to site conditions

## Ribble and Alt Estuaries SPA/ Ramsar

### Introduction

6.27 The Ribble & Alt Estuaries SPA / Ramsar lies on the coast of Lancashire and Sefton in northwest England, comprising extensive areas of sandflats, mudflats, saltmarsh, and grazing marsh (the latter two particularly in the lower stretches of the River Ribble). The large area includes two estuaries (R. Ribble and R. Alt), which in turn comprise part of the chain of west coast sites that fringe the Irish Sea. The southern limit of the SPA / Ramsar is formed by the sand dunes in the Sefton Coast SAC.

6.28 The site supports internationally important populations of breeding and wintering seabirds, wildfowl and waders. The sand dunes support vegetation communities and amphibian populations of international importance. Pressure on this site largely stems from its proximity to a large urban population, including recreational as well as development pressures. Beach recreation (e.g. motorsports carried out in the intertidal zone) is a particular recreation concern with the potential to disturb roosting flocks and ground-nesting birds. Low-lying aircrafts have also been reported to disturb bird roosts in the SPA/ Ramsar. Furthermore, recreational pressure concentrates around the coastal path, which is frequently used by cyclists and horse riders.

### SPA Qualifying Features<sup>166</sup>

6.29 Qualifying Annex I species:

- Ruff *Philomachus pugnax*
- Common tern
- Bewick's swan *Cygnus columbianus bewickii*

<sup>165</sup> [www.publications.naturalengland.org.uk/publication/6274126599684096](http://www.publications.naturalengland.org.uk/publication/6274126599684096)

<sup>166</sup> [www.publications.naturalengland.org.uk/publication/4868920422957056](http://www.publications.naturalengland.org.uk/publication/4868920422957056)

- Whooper swan *Cygnus Cygnus*
- Golden plover
- Bar-tailed godwit

Regular use by the following migratory species (other than those listed in Annex I):

- Lesser black-backed gull *Larus fuscus graellsii*
- Ringed plover
- Sanderling
- Redshank
- Pink-footed goose *Anser brachyrhynchus*
- Shelduck
- Wigeon
- Teal
- Pintail
- Oystercatcher
- Grey Plover
- Knot
- Sanderling
- Dunlin
- Black-tailed Godwit
- Redshank

Waterbird assemblage: cormorant, Bewick's swan, whooper swan, pink-footed goose, shelduck, wigeon, teal, pintail, scaup *Aythya marila*, common scoter *Melanitta nigra*, oystercatcher, ringed plover, golden plover, grey plover, lapwing, knot, sanderling, dunlin, black-tailed godwit, bar-tailed godwit, whimbrel *Numenius phaeopus*, curlew and redshank.

## Ramsar Qualifying Features<sup>167</sup>

6.30 The site is designated as a Ramsar for the following Criteria:

Criterion 2: The site supports up to 40% of the Great Britain population of natterjack toads.

Criterion 5: Assemblages of international importance. Species with peak counts in the winter – 222,038 waterfowl (5 year peak mean 1998/99-2002/2003).

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

### **Qualifying Species/populations (as identified at designation):**

#### **Species regularly supported during the breeding season:**

- Lesser black-backed gull

#### **Species with peak counts in spring/autumn:**

- Ringed plover *Charadrius hiaticula*
- Grey plover
- Red knot *Calidris canutus islandica*
- Sanderling

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<sup>167</sup> [www.jncc.gov.uk/jncc-assets/RIS/UK11057.pdf](http://www.jncc.gov.uk/jncc-assets/RIS/UK11057.pdf)

- Dunlin
- Black-tailed godwit
- Redshank
- Lesser black-backed gull

**Species with peak counts in winter:**

- Tundra/ Bewick's swan
- Whooper swan
- Pink-footed goose
- Shelduck
- Wigeon
- Teal
- Pintail
- Oystercatcher
- Bar-tailed godwit

## Conservation Objectives<sup>168</sup>

- 6.31 *"With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;*
- 6.32 *Ensure that 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."*

## Environmental Vulnerabilities

- 6.33 The Site improvement Plan<sup>169</sup> identifies the following pressures and threats to the SPA:
- Coastal squeeze
  - Air pollution: risk of atmospheric nitrogen deposition
  - Inappropriate scrub control
  - Invasive species
  - Hydrological changes
  - Public access/ disturbance
  - Fisheries: Commercial marine and estuarine
  - Shooting/ scaring
  - Feature location/ extent/ pressure condition unknown i.e., seabird assemblage and waterbird assemblage

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<sup>168</sup> [www.publications.naturalengland.org.uk/publication/4868920422957056](http://www.publications.naturalengland.org.uk/publication/4868920422957056)

<sup>169</sup> [www.publications.naturalengland.org.uk/publication/6274126599684096](http://www.publications.naturalengland.org.uk/publication/6274126599684096)

6.34 The Information Sheet on Ramsar Sites<sup>170</sup> identifies the following pressure and threat to the Ramsar site:

- Erosion

## Liverpool Bay/ Bae Lerwpl SPA

### Introduction

6.35 Liverpool Bay SPA lies in the eastern part of the Irish Sea, bordering the coastlines of north-west England and north Wales. The site covers an area of approximately 2,528km<sup>2</sup> and runs as a broad arc from Morecambe Bay to the east coast of Anglesey. Its seabed contains a range of mobile sediments, most commonly sand and gravelly sand, and is subject to relatively weak tidal currents (below 2 m/sec). Together with the large tidal range, this facilitates deposition of sediments and the formation of mud / sand belts.

6.36 Primarily the site encompasses marine habitats that support large aggregations of wintering red-throated diver and common scoter, as well as important foraging areas for breeding little tern (from the Dee Estuary SPA / Ramsar) and common tern (from the Mersey Narrows and North Wirral Foreshore SPA / Ramsar). The boundary of the SPA extends beyond 12 nautical miles from the English coastline and, therefore, partly lies in Welsh territorial waters.

### Qualifying Features<sup>171</sup>

6.37 The site is designated as a SPA for its:

Qualifying Annex I species:

- Red-throated diver *Gavia stellata* (non-breeding)
- Little gull (non-breeding)
- Little tern (breeding)
- Common tern (breeding)

Regular use by the following migratory species (other than those listed in Annex I):

- Common scoter

Waterbird assemblage: Main components include non-breeding red-throated diver, common scoter, red-breasted merganser *Mergus serrator* and great cormorant.

### Conservation Objectives<sup>172</sup>

6.38 “With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the ‘Qualifying Features’ listed below), and subject to natural change;

6.39 Ensure that 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.”

<sup>170</sup> <https://jncc.gov.uk/jncc-assets/RIS/UK11057.pdf>

<sup>171</sup> [www.publications.naturalengland.org.uk/publication/5089733892898816](http://www.publications.naturalengland.org.uk/publication/5089733892898816)

<sup>172</sup> [www.publications.naturalengland.org.uk/publication/5089733892898816](http://www.publications.naturalengland.org.uk/publication/5089733892898816)



## Environmental Vulnerabilities

6.40 The Site improvement Plan<sup>173</sup> identifies the following pressures and threats to the SPA:

- Fisheries: Commercial marine and estuarine
- Transportation and service corridors
- Fisheries: Recreational marine and estuarine
- Extraction: non-living resources e.g. aggregate dredging
- Siltation
- Water pollution

## Martin Mere SPA/ Ramsar

### Introduction

6.41 Martin Mere SPA / Ramsar is a wetland nature reserve managed by the Wildfowl and Wetlands Trust. It occupies a site comprising a former lake and mire, which extended over 1,300 ha of the Lancashire coastal plain in the 17<sup>th</sup> century. Until it was drained, Martin Mere was the largest freshwater body in England. Active management of the mere began in 1692, with most remaining sections of land now in agricultural use. The land levels have dropped by as much as 4 m over the last 100 years as a result of hundreds of years of land drainage. Agriculture is a protected use in Martin Mere, with a pumped drainage system keeping agricultural land adjacent to the SPA/ Ramsar dry.

6.42 Today, the SPA/ Ramsar comprises open water, seasonally flooded marsh and damp hay meadows overlying peat. The site harbours a large refuge for wintering, passage and breeding birds, including significant numbers of Bewick's swans, whooper swans, pink-footed geese and pintail. The SPA/ Ramsar is a significant component of the network of sites that includes nearby estuarine and coastal sites in the wider Liverpool area.

### SPA Qualifying Features<sup>174</sup>

6.43 The site is designated as a SPA for its:

Migratory bird species:

- Pink-footed goose
- Teal
- Pintail
- Bewick's swan
- Gadwall *Anas strepera*
- Mallard *Anas platyrhynchos*
- Whooper swan
- Shoveler *Anas clypeata*
- Snipe *Gallinago gallinago*
- Lapwing
- Bar-tailed godwit
- Ruff

Breeding bird species:

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<sup>173</sup> [www.publications.naturalengland.org.uk/publication/5296526586806272](http://www.publications.naturalengland.org.uk/publication/5296526586806272)

<sup>174</sup> [www.publications.naturalengland.org.uk/publication/4833056372293632](http://www.publications.naturalengland.org.uk/publication/4833056372293632)

- Greylag goose *Anser anser*
- Gadwall
- Mallard
- Snipe

## Ramsar Qualifying Features<sup>175</sup>

6.44 The site is designated as a Ramsar for the following Criteria:

Criterion 5: Assemblages of international importance. Species with peak counts in the winter – 25,306 waterfowl (5 year peak mean 1998/99-2002/2003).

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

### **Qualifying Species/populations (as identified at designation):**

#### **Species with peak counts in spring/autumn:**

- Pink-footed goose

#### **Species with peak counts in winter:**

- Tundra/ Bewick's swan
- Whooper swan
- Wigeon
- Pintail

## Conservation Objectives<sup>176</sup>

6.45 *“With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the ‘Qualifying Features’ listed below), and subject to natural change;*

6.46 *Ensure that 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.”*

## Environmental Vulnerabilities

6.47 The Site improvement Plan<sup>177</sup> identifies the following pressures and threats to the SPA:

- Hydrological changes
- Invasive species
- Water pollution

6.48 The Information Sheet on Ramsar Sites<sup>178</sup> does not identify any pressures and threats to the Ramsar site.

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<sup>175</sup> [www.jncc.gov.uk/jncc-assets/RIS/UK11039.pdf](http://www.jncc.gov.uk/jncc-assets/RIS/UK11039.pdf)

<sup>176</sup> [www.publications.naturalengland.org.uk/publication/5089733892898816](http://www.publications.naturalengland.org.uk/publication/5089733892898816)

<sup>177</sup> [www.publications.naturalengland.org.uk/publication/6181803727519744](http://www.publications.naturalengland.org.uk/publication/6181803727519744)

<sup>178</sup> [www.jncc.gov.uk/jncc-assets/RIS/UK11039.pdf](http://www.jncc.gov.uk/jncc-assets/RIS/UK11039.pdf)

## Manchester Mosses SAC

### Introduction

6.49 Mossland formerly covered a very large part of Greater Manchester, Merseyside, south Lancashire and north Cheshire, and provided a severe obstacle to industrial and agricultural expansion. While most has been converted to agriculture or lost to development, several examples have survived as degraded raised bog, such as Risley Moss, Astley and Bedford Mosses, and Holcroft Moss on the Mersey floodplain. Their surfaces are now elevated above adjacent land due to shrinkage of the surrounding tilled land, and all except Holcroft Moss have been cut for peat at some time in the past. While past drainage has produced dominant purple moor-grass *Molinia caerulea*, bracken *Pteridium aquilinum* and birch *Betula* spp. scrub or woodland, wetter pockets have enabled peat-forming species to survive.

### Qualifying Features<sup>179</sup>

6.50 The site is designated as a SAC for its:

Qualifying Annex 1 habitat:

- Degraded raised bogs still capable of natural regeneration

### Conservation Objectives<sup>180</sup>

6.51 *“With regard to the SAC and the natural habitats and/or species for which the site has been designated (the ‘Qualifying Features’ listed below), and subject to natural change;*

6.52 *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*
- *The structure and function (including typical species) of qualifying natural habitats, and,*
- *The supporting processes on which qualifying natural habitats rely”.*

### Environmental Vulnerabilities

6.53 The Site improvement Plan<sup>181</sup> identifies the following pressures and threats to the SAC:

- Hydrological changes
- Air pollution: impact of atmospheric nitrogen deposition

## Halkyn Mountain/ Mynydd Helygain SAC

### Introduction

6.54 The majority of the site is located 4km to the northwest of Mold in Flintshire, and lies at between 100-300m. The site comprises predominantly common land situated on an elongated plateau of Lower Carboniferous Limestone which trends north-south, with the Dee Estuary to the east and the Clwydian Hills to the west. The site supports many former mineral workings including metalliferous mine spoil tips along with small chert and limestone quarries. Three large quarries currently operate on Halkyn Common, two of which are included within Halkyn Common and Holywell Grasslands SSSI for their mineral interest.

6.55 The relict industrial landscape supports a mosaic of calcareous grasslands, bracken and dry heath with localised heavy metal tolerant vegetation developed on old metal mine spoil. In places where surface drainage is impeded small areas of rush pasture, wet heath, marshy grasslands and fen communities can be found. The disused quarries and pits throughout the site contain numerous small pools, which support

<sup>179</sup> [www.publications.naturalengland.org.uk/publication/5283870555504640](http://www.publications.naturalengland.org.uk/publication/5283870555504640)

<sup>180</sup> [www.publications.naturalengland.org.uk/publication/4577218189590528](http://www.publications.naturalengland.org.uk/publication/4577218189590528)

<sup>181</sup> [www.publications.naturalengland.org.uk/publication/6676598321315840](http://www.publications.naturalengland.org.uk/publication/6676598321315840)

one of the largest known breeding populations of the great crested newt (*Triturus cristatus*) in Wales along with an assemblage of other more widespread amphibian species. At the northern end of the plateau, along the west facing slope, a series of base-rich springs feed a small base-rich flush and associated fen-meadow.

- 6.56 Two outlying areas of Halkyn Mountain SAC supporting significant stands of calaminarian grassland over old lead workings are to be found near the town of Holywell. The first area known locally as the Gowdal lies just to the west of Holywell town centre and the other, Herward Smithy comprises a small enclosure lying 2km to the southeast of Holywell.

## Qualifying Features<sup>182</sup>

- 6.57 The site is designated as a SAC for its:

### Qualifying Annex I habitat:

- Calaminarian grasslands of the *Violetalia calaminariae*

### Qualifying Annex I habitats present as a qualifying feature, but not a primary reason for selection:

- European dry heaths
- Semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco – Brometalia*) (\*important orchid sites)
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)

### Qualifying Annex II species:

- Great crested newt

## Conservation Objectives<sup>183</sup>

- 6.58 To maintain favourable conservation status as defined in Articles 1(e) and 1(i) of the Habitats Directive:

*“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.*

*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*
- *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.”*

## Environmental Vulnerabilities

- 6.59 The Standard Data Form<sup>184</sup> identifies the following pressures and threats to the SAC:

<sup>182</sup> [www.sac.incc.gov.uk/site/UK0030163](http://www.sac.incc.gov.uk/site/UK0030163)

<sup>183</sup> [www.naturalresources.wales/media/672548/Halkyn%20SAC%20Plan%20 Eng\\_.pdf](http://www.naturalresources.wales/media/672548/Halkyn%20SAC%20Plan%20Eng_.pdf)

<sup>184</sup> [www.sac.incc.gov.uk/site/UK0030163](http://www.sac.incc.gov.uk/site/UK0030163)

- Grazing
- Mining and quarrying
- Utility and service lines
- Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)
- Outdoor sports and leisure activities, recreational activities
- Air pollution, air-borne pollutants
- Soil pollution and solid waste (excluding discharges)
- Invasive non-native species
- Problematic native species
- Fire and fire suppression
- Human induced changes in hydraulic conditions
- Biocenotic evolution, succession i.e., the process by which the structure of a biological community evolves over time.

## Deeside and Buckley Newt Sites SAC

### Introduction<sup>185</sup>

- 6.60 *“The site supports a breeding population of over 1000 adult great crested newts as identified by torch surveys in the spring. The population of newts is stable or increasing, with at least 100 display/breeding ponds present across the site. Native macrophyte plants cover many of the ponds, but at least 40% of the surface remains as open water. Fish are absent from all breeding/display ponds that support great crested newts, and wildfowl are only seen in small numbers. No non-native aquatic species will be present in any of the ponds. Water bodies throughout the site will exhibit a diverse range of seral conditions. Tall vegetation that surrounds the ponds will not cause excessive shading.*
- 6.61 *On land, vegetation, together with fallen trees, and large stones provides refuge areas for the newts during the day as well as suitable foraging areas, and hibernation places for amphibians. Great crested newts disperse between the ponds using a network of terrestrial corridors, formed by hedgerows and rough grasslands, together with habitats, such as grassland between ponds using ponds, woodland or scrub, that function as stepping-stones. Between sites, new surface water management systems will be amphibian friendly and will therefore not hinder newt dispersal.”*

### Qualifying Features<sup>186</sup>

- 6.62 The site is designated as a SAC for its:

Qualifying Annex I habitat:

- Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

Qualifying Annex II species:

- Great crested newt

### Conservation Objectives<sup>187</sup>

- 6.63 To maintain favourable conservation status as defined in Articles 1(e) and 1(i) of the Habitats Directive:

<sup>185</sup> [www.naturalresources.wales/media/671740/Deeside\\_and\\_Buckley\\_WES32\\_Plan\\_English.pdf](http://www.naturalresources.wales/media/671740/Deeside_and_Buckley_WES32_Plan_English.pdf)

<sup>186</sup> [www.sac.jncc.gov.uk/site/UK0030132](http://www.sac.jncc.gov.uk/site/UK0030132)

<sup>187</sup> [www.naturalresources.wales/media/671740/Deeside\\_and\\_Buckley\\_WES32\\_Plan\\_English.pdf](http://www.naturalresources.wales/media/671740/Deeside_and_Buckley_WES32_Plan_English.pdf)

*“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.*

*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*
- *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.”*

## Environmental Vulnerabilities

6.64 The Standard Data Form<sup>188</sup> identifies the following pressures and threats to the SAC:

- Mowing/ cutting of grassland
- Grazing
- ‘Other’ forestry activities
- Air pollution, air-borne pollutants
- Soil pollution and solid waste (excluding discharges)
- Invasive non-native species
- Problematic native species
- Other ecosystem modifications
- Biocenotic evolution, succession

## Oak Mere SAC

### Introduction

6.65 Oak Mere is a shallow lake formed in glacial drift some 15,000 years ago. It is unique because of its unusual water chemistry which gives rise to an outstanding assemblage of aquatic plants, including shore weed *Littorella uniflora* and narrow small-reed *Calamagrostis stricta*, together with a wide diversity of invertebrate groups. Associated with the main lake are a number of surrounding boggy pools and basin mires. The hydrology of the whole site is complex, resulting in fluctuations in water levels which periodically leave wide draw-down zones.

### Qualifying Features<sup>189</sup>

6.66 The site is designated as a SAC for its:

Qualifying Annex I habitats:

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<sup>188</sup> <https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0030132.pdf>

<sup>189</sup> [www.publications.naturalengland.org.uk/publication/4577218189590528](http://www.publications.naturalengland.org.uk/publication/4577218189590528)

- Oligotrophic waters containing very few minerals of sandy plains: *Littorelletalia uniflorae*. (Nutrient-poor shallow waters with aquatic vegetation on sandy plains)
- Transition mires and quaking bogs. (Very wet mires often identified by an unstable ‘quaking’ surface)

## Conservation Objectives<sup>190</sup>

- 6.67 “With regard to the SAC and the natural habitats and/or species for which the site has been designated (the ‘Qualifying Features’ listed below), and subject to natural change;
- 6.68 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
  - The structure and function (including typical species) of qualifying natural habitats, and
  - The supporting processes on which qualifying natural habitats rely”

## Environmental Vulnerabilities

- 6.69 The Site improvement Plan<sup>191</sup> identifies the following pressures and threats to the SAC:
- Water pollution
  - Invasive species
  - Hydrological changes
  - Air pollution: impact of atmospheric nitrogen deposition

# Alyn Valley Woods/ Coedwigoedd Dyffryn Alun SAC

## Introduction

- 6.70 The site predominantly occupies the steep Carboniferous Limestone escarpment alongside the river Alyn, together with adjoining areas. The site supports a large stand of semi-natural broadleaved woodland namely the SAC feature ‘*Tilio – Acerion* forests of slopes, screes and ravines’, arising along the steep gorge of the river Alyn and the Alyn’s tributaries Nant Gain and Aber Eilun. Narrow woodland strips along the valley bottom and on the wetter ground of the floodplain around Aber Eilun are dominated by wet woodland corresponding to the SAC feature ‘Alluvial forest with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno – Padion*, *Alnion incanae*, *Salicion alvae*)’.
- 6.71 Several small areas of species rich calcicolous grassland constitute the third SAC feature ‘Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco – Brometalia*)’.

## Qualifying Features<sup>192</sup>

- 6.72 The site is designated as a SAC for its:

### Qualifying Annex I habitat:

- *Tilio-Acerion* forests of slopes, screes and ravines\*

Annex I priority habitats are denoted by an asterisk (\*).

### Qualifying Annex I habitats present as a qualifying feature, but not a primary reason for selection:

- Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (\*important orchid sites)

<sup>190</sup> Ibid

<sup>191</sup> <http://publications.naturalengland.org.uk/publication/5056911862923264>

<sup>192</sup> [www.jncc.gov.uk/jncc-assets/SAC-N2K/UK0030078.pdf](http://www.jncc.gov.uk/jncc-assets/SAC-N2K/UK0030078.pdf)

- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

Qualifying Annex II species:<sup>193</sup>

- Otter
- Lesser horseshoe bat *Rhinolophus hipposideros*

## Conservation Objectives<sup>194</sup>

6.73 To maintain favourable conservation status as defined in Articles 1(e) and 1(i) of the Habitats Directive:

*“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.*

*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*
- *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.”*

## Environmental Vulnerabilities

6.74 The Standard Data Form<sup>195</sup> identifies the following pressures and threats to the SAC:

- Grazing
- Forest and Plantation management and use
- Forestry activities not previously referred to
- Other urbanisation, industrial and similar activities
- Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)
- Outdoor sports and leisure activities, recreational activities
- Air pollution, air-borne pollutants
- Invasive non-native species
- Problematic native species
- Biocenotic evolution, succession
- Interspecific floral relations

<sup>193</sup> <https://eunis.eea.europa.eu/sites/UK0030078#tab-species>

<sup>194</sup> [www.naturalresources.wales/media/670837/Alyn%20Valley%20Woods%20WES32%20Plan.pdf](http://www.naturalresources.wales/media/670837/Alyn%20Valley%20Woods%20WES32%20Plan.pdf)

<sup>195</sup> [www.jncc.gov.uk/jncc-assets/SAC-N2K/UK0030078.pdf](http://www.jncc.gov.uk/jncc-assets/SAC-N2K/UK0030078.pdf)



# River Dee and Bala Lake/ Afon Dyfrdwy a Llyn Tegid SAC

## Introduction

- 6.75 The River Dee has its source in Snowdonia at the outflow of Llyn Tegid and it includes the Ceiriog, Meloch, Tryweryn and Mynach tributaries. Its catchment contains a wide spectrum of landscape from high mountains around Bala, rugged peaks near Llangollen, steep sided wooded valleys, and the plains of Cheshire, Flintshire, north Shropshire and Wrexham. There is a tidal influence as far upstream as Farndon and high tides regularly exceed the Chester weir crest level.
- 6.76 The aquatic plant community includes Wirtgen's water-crowfoot *Ranunculus x bachii* and pond water-crowfoot *R. peltatus*, and also floating water-plantain *Luronium natans*. Water-crowfoot forms extensive beds along the whole length of the Dee where flow conditions are suitable. Other aquatic plants which occur within the site include intermediate water-starwort *Callitriche hamulata*, alternate-flowered water-milfoil *Myriophyllum alterniflorum* and bryophytes including *Rhynchostegium riparoides* and *Fontinalis antipyretica*. Marginal vegetation consists mainly of reed canary-grass *Phalaris arundinacea* with occasional branched bur-reed *Sparganium erectum*.
- 6.77 There is good tree cover along the banks of the River Dee and the tributaries, with the Ceiriog being tree lined on both banks along much of its length. The dominant species are alder *Alnus glutinosa* and willow *Salix* spp., with occasional ash *Fraxinus excelsior* and oak *Quercus* spp. Where sections of the riverbank have been fenced off the vegetation tends to be dominated by bramble *Rubus fruticosus* agg., nettles *Urtica dioica* and other tall ruderals.
- 6.78 The River Dee is recognised as one of North Wales' premier rivers for Atlantic salmon *Salmo salar*. The Mynach, Meloch and Ceiriog tributaries are the most important salmon spawning tributaries in the Dee catchment. Other migratory fish utilising the river system include river lamprey *Lampetra fluviatilis* and sea lamprey *Petromyzon marinus*. The Dee also supports important populations of non-migratory fish including bullhead *Cottus gobio* and brook lamprey *Lampetra planeri*. The otter *Lutra lutra* is well established throughout the river system, especially where appropriate bank side cover exists.

## Qualifying Features<sup>196</sup>

- 6.79 The site is designated as a SAC for its:

### Qualifying Annex I habitat:

- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation. (Rivers with floating vegetation often dominated by water-crowfoot)

### Qualifying Annex II species:

- Atlantic salmon *Salmo salar*
- Brook lamprey *Lampetra planeri*
- Bullhead *Cottus gobio*
- Floating water-plantain *Luronium natans*
- Otter *Lutra lutra*
- River lamprey *Lampetra fluviatilis*
- Sea lamprey *Petromyzon marinus*

<sup>196</sup> [www.publications.naturalengland.org.uk/publication/4660149109129216](http://www.publications.naturalengland.org.uk/publication/4660149109129216)

## Conservation Objectives<sup>197</sup>

- 6.80 “With regard to the SAC and the natural habitats and/or species for which the site has been designated (the ‘Qualifying Features’ listed below), and subject to natural change;
- 6.81 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”.

## Environmental Vulnerabilities

- 6.82 The Standard Data Form<sup>198</sup> does not identify any pressures and threats to the SAC.

## River Eden SAC

### Introduction

- 6.83 The Eden is an outstanding floristically rich, northern river on sandstone and hard limestone. Situated within multiple National Character Areas (NCA) including, Cumbria High Fells, Orton Fells, North Pennines, Solway Basin, Border Moors and Forests, Tyne Gap and Hadrian’s Wall and the Yorkshire Dales, the catchment includes headwaters running off the Yorkshire Dales, the North Pennines and the eastern fells of the Lake District and the major standing water body of Ullswater and it flows north to discharge into the Solway Estuary.
- 6.84 Streams flowing from limestone are calcareous, whilst those flowing off the Pennines and the Lake District fells are more acidic. The nutrient status gradually changes along the Eden’s length as nutrient loadings naturally increase in the lower reaches.
- 6.85 The variation in geology, altitude and flow result in an extremely high number of aquatic plant species with over 180 species recorded, many uncommon and at the edge of their geographical range. In places on the Eden there are natural riparian habitats of wet woodland sedge swamp and oxbow lakes. The River Irthing in particular supports extensive areas of alder floodplain woodland and the river shingles that this dynamic habitat forms upon.
- 6.86 The River Eden is one of the finest rivers in the UK for Atlantic salmon, bullhead and the three lamprey species found in the UK. The limestone streams and the upper main river support an extensive white-clawed crayfish *Austropotamobius pallipes* population. Otter is found throughout the catchment.

## Qualifying Features<sup>199</sup>

- 6.87 The site is designated as a SAC for its:

### Qualifying Annex I habitats:

- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*). (Alder woodland on floodplains)\*

<sup>197</sup> Ibid

<sup>198</sup> [www.jncc.gov.uk/jncc-assets/SAC-N2K/UK0030252.pdf](http://www.jncc.gov.uk/jncc-assets/SAC-N2K/UK0030252.pdf)

<sup>199</sup> [www.publications.naturalengland.org.uk/publication/5935614042046464](http://www.publications.naturalengland.org.uk/publication/5935614042046464)

- Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea*. (Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels)
- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation. (Rivers with floating vegetation often dominated by water-crowfoot)

Annex I priority habitats are denoted by an asterisk (\*).

Qualifying Annex II species:

- Atlantic salmon
- Brook lamprey
- Bullhead
- Otter
- River lamprey
- Sea lamprey
- White-clawed (or Atlantic stream) crayfish

## Conservation Objectives<sup>200</sup>

6.88 *With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;*

6.89 *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.”*

## Environmental Vulnerabilities

6.90 The Site improvement Plan<sup>201</sup> identifies the following pressures and threats to the SAC:

- Water pollution
- Agricultural management practices
- Physical modification
- Invasive species
- Changes in species distributions i.e., salmon
- Forestry and woodland management
- Hydrological changes
- Disease i.e., from signal crayfish *Pacifastacus leniusculus*

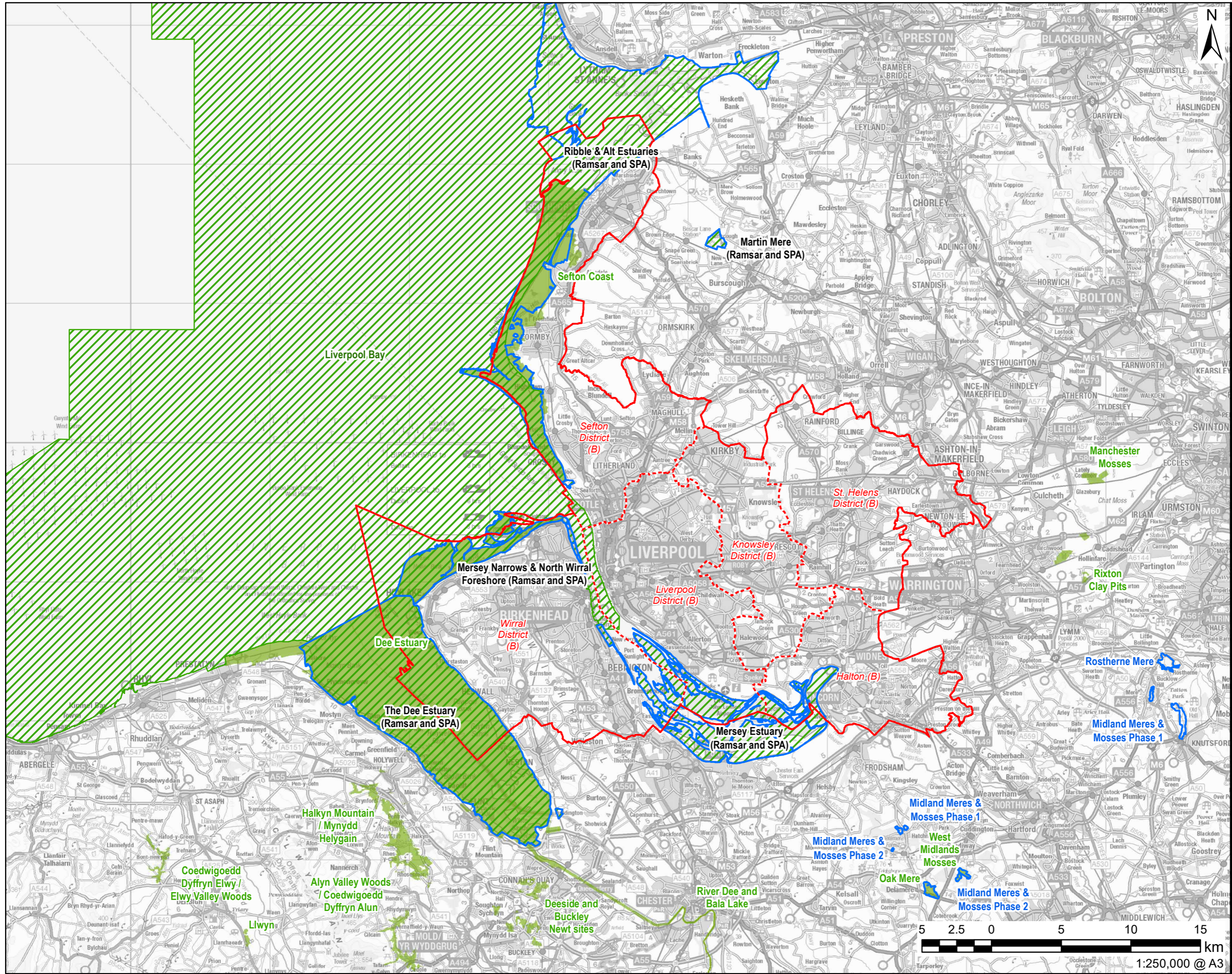
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<sup>200</sup> Ibid

<sup>201</sup> <http://publications.naturalengland.org.uk/publication/5920746052255744> [accessed 10/02/2021]

# Appendix B

## B.1 Figure 1.B European Sites



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# Appendix C

## C.1 Likely Significant Effects Assessment of the Plan Policies

**Table C.1. Screening table of the policies included in the Liverpool City Region Combined Authority Sustainable Development Strategy**

Policy number/ name	Policy summary and proposed approach (full policy details can be found in the SDS document)	Likely Significant Effects Screening Assessment
<b>LCR SS1 – Liverpool City Region Spatial Strategy</b>	<p>To create and maintain sustainable places and communities and deliver a more prosperous and inclusive economy, development, including the provision for a minimum of 83,600 new homes and a minimum of 521 hectares of employment land between 2021 and 2040, will be directed to sustainable locations. Development will be focussed on the Liverpool City Centre, the Inner Urban Area and the Wider Urban Area.</p> <p>The full policy wording may be viewed in the SDS document.</p>	<p><b>No Likely Significant Effects, screened out.</b></p> <p>This is a strategic policy that has been developed in response to the SDS vision and objectives.</p> <p>Although it specifies the quantum of development it does not provide exact locations.</p>
<b>Spatial Priorities</b>		
<b>Policy LCR SP1 – Strategic Housing Need and Distribution</b>	<p>1. A minimum of 83, 600 net additional dwellings should be delivered in the Liverpool City Region over the period 2021- 40, or an annual average of around 4,400 net dwellings.</p> <p>2. Liverpool City Region constituent local authorities should identify sufficient deliverable and developable sites and/or broad locations for their respective plan period, to meet the housing requirements in Table 5.1 below. Local authorities should work proactively with applicants to deliver sites that accord with the spatial strategy and relevant policies of this Plan and Local Plans.</p> <p>3. The overall housing requirement will be met from the following sources:</p> <ol style="list-style-type: none"> <li>Strategic housing sites set out in Table 5.2 below;</li> <li>Local Plan housing allocations;</li> <li>Housing completions since 2021;</li> <li>Sites with planning permission<sup>202</sup>;</li> <li>Developable sites without planning permission identified in local authorities (or any future Liverpool City Region) Strategic Housing Land Availability Assessment (SHLAA); and</li> <li>'Windfall' development.</li> </ol> <p>4. The indicative phasing of development is set out in Table 5.1..</p> <p>5. Each local authority should maintain a sufficient supply of deliverable sites to provide for at least five years' worth of housing, plus an appropriate buffer in accordance with national policy.</p> <p>6. Each local authority should monitor delivery rates within their area to ensure that delivery rates are maintained as anticipated in this Plan. This monitoring work will feed into the regular reviews of this Plan.</p> <p>Table 5.1: Distribution and Indicative Phasing of New Housing 2021-2040</p>	<p><b>Potential Likely Significant Effects</b></p> <p>This policy specifies areas where it will prioritise development. These developments could potentially create the following source receptor impact pathways:</p> <ul style="list-style-type: none"> <li>Recreational pressure;</li> <li>Loss of Functionally Linked Habitat should the development be located within 10km of SPAs;</li> <li>Reduction of Water Quality should the development discharge its waste through a Sewage Treatment Works within 8km upstream of a European Designated Site;</li> <li>Urbanisation should the development be located within 1km of a European site;</li> <li>Reduction of Air Quality should the development cause an increase in employment traffic on roads that pass within 200m of a nitrogen sensitive SAC.</li> </ul>

<sup>202</sup> Note this excludes those sites with planning permission identified as strategic housing sites.

Policy number/ name	Policy summary and proposed approach (full policy details can be found in the SDS document)							Likely Significant Effects Screening Assessment							
	Local Authority	2021-2025	2025-2030	2030-2035	2035-2040	Total 2021 - 2040	Total average per annum 2021-2040 (for illustration purposes only)								
Halton	1400 350 dpa	1750 350 dpa	1750 350 dpa	1351 270 dpa	6251	329									
Knowsley	1800 450 dpa	1868 373 dpa	1295 295 dpa	1295 295 dpa	6258	329									
Liverpool	6956 1739 dpa	8695 1739 dpa	9585 1917 dpa	10,920 2184 dpa	36,156	1902									
Sefton	2560 640 dpa	3200 640 dpa	2935 587 dpa	2935 587 dpa	11,630	612									
St Helens	1944 486 dpa	2430 486 dpa	2430 486 dpa	2166 433 dpa	8970	472									
Wirral	3340 850 dpa	4175 850 dpa	4175 850 dpa	3920 784 dpa	15,610	821									
<b>LCR Totals</b>	<b>18,000</b>	<b>22,118</b>	<b>22,170</b>	<b>22,587</b>	<b>84,875</b>										
<b>LCR Average Per Annum</b>	<b>4500</b>	<b>4424</b>	<b>4434</b>	<b>4517</b>	<b>4460</b>										

Table 5.2: LCR Strategic Housing Sites



LCR REF	Site	Indicative capacity	Site area (ha)
SH1	Daresbury	1,476	75.9
SH2	Sandymoor	1,424	65.9
SH3	North East Widnes	1,155	56.3
SH4	Halebank	538	25.3
SH5	East of Halewood	2,035	56.1
SH6	South Whiston (Halsnead Garden Village)	1,585	79.5
SH7	Cherryfield Drive	819	8.8
SH8	Land at Leeds St / Lanyork Road	742	0.8
SH9	Liverpool Waters	5,960	28.0
SH10	Scotland Rd/ Bevington Bush/Nicholas St	614	0.8
SH11	Former International Garden Festival Site	1,374	49.1
SH12	Brunswick Quay	552	1.0
SH13	Northern Dock	1,796	15.0
SH14	Aintree University Hospital	500	8.9
SH15	Freemasons Row	656	0.5
SH16	George St Development Area	1,008	1.5
SH17	Crowland Street	500	25.8

Policy number/ name	Policy summary and proposed approach (full policy details can be found in the SDS document)				Likely Significant Effects Screening Assessment
	SH19	Town Lane	661	14.2	
	SH20	Land at Florida Farm	522	17.4	
	SH21	Bold Garden Village	690 <sup>11</sup>	99.7	
	SH22	Garton's Lane	569	16.3	
	SH23	Cowley Hill	742 <sup>12</sup>	31.1	
	SH24	Moss Nook	802	20.1	
	SH25	Land at Hind Street, Tranmere	1,400	14.7	
	SH26	Wirral Waters	3,234	12.7	
	SH27	Former D1 Oils Dock	1,225	23.5	
	<b>TOTAL</b>		<b>34,377</b>	<b>834</b>	
<p><b>Policy LCR SP2 – Strategic Employment Land Need and Distribution</b></p>	<p>1. Within the Liverpool City Region over the period 2021-2040 provision should be made for the following amount of employment land:</p> <ul style="list-style-type: none"> <li>a) General industrial (B2 uses) - a minimum of 521ha</li> <li>b) Office and research and development (use class E (g) (iii)) uses – a minimum of 281,600 sq.m</li> <li>c) Strategic B8 storage and distribution uses –293-343ha</li> </ul> <p>2. Liverpool City Region constituent local authorities should identify sufficient developable sites and/or broad locations for their respective plan period, to meet the employment land and floorspace requirements set in tables 5.7 – 5.8 below.</p>				<p><b>Potential Likely Significant Effects</b></p> <p>This policy specifies areas where it will prioritise development. These developments could potentially create the following source receptor impact pathways:</p> <ul style="list-style-type: none"> <li>• Loss of Functionally Linked Habitat should the development be located within 10km of SPAs;</li> <li>• Reduction of Water Quality should the development discharge its waste through a Sewage Treatment Works within 8km upstream of a European Designated Site;</li> <li>• Urbanisation should the development be located within 1km of a European site;</li> </ul>

Policy number/ name	Policy summary and proposed approach (full policy details can be found in the SDS document)	Likely Significant Effects Screening Assessment																
	<p>3. Strategic employment sites are set out in table 5.9 below. These sites should be protected for employment use in accordance with national and local policy. Development proposals within or adjacent to strategic employment sites should not compromise the integrity or effectiveness of these locations in accommodating employment activities and their ability to operate on a 24-hour basis where appropriate.</p> <p>4. The successful delivery of the Liverpool City Region Freeport Sites, Liverpool City Region Life Sciences Investment Zone and any other subsequent flagship Government economic initiatives will be promoted and supported by the Combined Authority. The Combined Authority will work alongside local authorities, national government and relevant partners and agencies to maximise the significant and additional benefits these sites and initiatives bring to the city region and nationally</p> <p>5. The retention, enhancement and provision of strategic B8 capacity should be prioritised firstly in locations that have potential for the transport of goods by rail and/or water transport and secondly in locations that are accessible to the strategic road network.</p> <p>6. Liverpool City Region constituent local authorities should adopt a flexible and responsive approach to economic sectors showing growth potential over the SDS plan period, subject to development proposals complying with relevant policies of this SDS and local policy.</p> <p>7. The Liverpool City Region constituent local authorities should monitor the supply of employment land and floorspace, taking into account the findings of strategic and local employment land reviews to ensure that there continues to be a sufficient supply of employment land and floorspace available, in the right locations, and of the right quality, and should take action as necessary to ensure that supply is maintained as anticipated in this Plan</p> <p>Table 5.7 Minimum Employment land required for general industrial uses over the period 2021 to 2040</p> <table border="1" data-bbox="450 994 1395 1289"> <thead> <tr> <th>Local Authority</th> <th>General Industrial Employment Land Requirement (Hectares)</th> </tr> </thead> <tbody> <tr> <td>Halton</td> <td>95.9</td> </tr> <tr> <td>Knowsley</td> <td>107.0</td> </tr> <tr> <td>Liverpool</td> <td>123.7</td> </tr> <tr> <td>Sefton</td> <td>42.3</td> </tr> <tr> <td>St Helens</td> <td>111.5</td> </tr> <tr> <td>Wirral</td> <td>40.3</td> </tr> <tr> <td><b>LCR Total</b></td> <td><b>520.7</b></td> </tr> </tbody> </table> <p>Table 5.8 Minimum employment land required for office and research and development uses over the period 2021 to 2040</p>	Local Authority	General Industrial Employment Land Requirement (Hectares)	Halton	95.9	Knowsley	107.0	Liverpool	123.7	Sefton	42.3	St Helens	111.5	Wirral	40.3	<b>LCR Total</b>	<b>520.7</b>	<ul style="list-style-type: none"> <li>Reduction of Air Quality should the development cause an increase in employment traffic on roads that pass within 200m of a nitrogen sensitive SAC.</li> </ul>
Local Authority	General Industrial Employment Land Requirement (Hectares)																	
Halton	95.9																	
Knowsley	107.0																	
Liverpool	123.7																	
Sefton	42.3																	
St Helens	111.5																	
Wirral	40.3																	
<b>LCR Total</b>	<b>520.7</b>																	

Policy number/ name	Policy summary and proposed approach (full policy details can be found in the SDS document)			Likely Significant Effects Screening Assessment
	<b>Local Authority</b>	<b>Floorspace Requirement for Office (sq.m)</b>	<b>Floorspace Requirement for Research and Development (sq.m)</b>	
Halton	8,200	8,700		
Knowsley	28,300	9,200		
Liverpool	129,000	53,200		
Sefton	2,900	3,800		
St Helens	9,400	3,400		
Wirral	17,300	8,200		
<b>LCR Total</b>	<b>195, 100</b>	<b>86, 500</b>		
Table 5.9: Liverpool City Region Strategic Employment Sites				
<b>SDS Ref</b>	<b>Site</b>		<b>Indicative Area<sup>63</sup> (Hectares) Site Developable areas</b>	
<b>SE1</b>	The Heath Business Park, Halton		0.5	
<b>SE2</b>	Sci-Tech Daresbury, Halton		18.2	
<b>SE3</b>	West Runcorn (incl. Ineos, INOVYN), Halton <sup>64</sup>		N/A	
<b>SE4</b>	3MG, Halton		78	
<b>SE5</b>	Knowsley Industrial and Business Parks, Knowsley		60.03	
<b>SE6</b>	Jaguar Land Rover, Knowsley		0.46	
<b>SE7</b>	Land South of M62, Knowsley		22.51	
<b>SE8</b>	CBD, Liverpool		2.89	
<b>SE9</b>	Knowledge Quarter, Liverpool		N/A	
<b>SE10</b>	Atlantic Business Park, Sefton		16.8	
<b>SE11</b>	East of Maghull, Sefton		17.1	
<b>SE12</b>	Omega South, St. Helens		13.39	
<b>SE13</b>	Parkside65 (East), St. Helens		64.55	
<b>SE14</b>	Parkside (West), St. Helens		79.75	
<b>SE15</b>	Haydock Industrial Estate, St. Helens		28.33	

Policy number/ name	Policy summary and proposed approach (full policy details can be found in the SDS document)	Likely Significant Effects Screening Assessment									
	<table border="1"> <tr> <td data-bbox="461 244 562 276">SE16</td> <td data-bbox="562 244 1167 276">Glass Futures</td> <td data-bbox="1167 244 1402 276">1.64</td> </tr> <tr> <td data-bbox="461 276 562 308">SE17</td> <td data-bbox="562 276 1167 308">Northside, Wirral</td> <td data-bbox="1167 276 1402 308">13.11</td> </tr> <tr> <td data-bbox="461 308 562 347">SE18</td> <td data-bbox="562 308 1167 347">Wirral Waters, Wirral</td> <td data-bbox="1167 308 1402 347">22.37</td> </tr> </table>	SE16	Glass Futures	1.64	SE17	Northside, Wirral	13.11	SE18	Wirral Waters, Wirral	22.37	
SE16	Glass Futures	1.64									
SE17	Northside, Wirral	13.11									
SE18	Wirral Waters, Wirral	22.37									
<b>Policy LCR SP3 - Brownfield Deliverability and Regeneration</b>	<p>1. The use of previously developed ‘brownfield’ land will be maximised to meet development needs and support regeneration. Key measures to support delivery on brownfield land will include:</p> <ol style="list-style-type: none"> <li>Proactive use of the Brownfield Land Registers;</li> <li>Pursuing opportunities for coordinated, effective and efficient use of public sector brownfield assets for development including through the Liverpool City Region One Public Estate Partnership;</li> <li>Utilising Combined Authority funding, including the Strategic Investment Fund (SIF) as well as national funding, including the Brownfield Land Release Fund, One Public Estate Brownfield Land Release Fund and other external sources.</li> </ol> <p>2. To support and promote regeneration, high priority should be given to the sustainable development of brownfield land that is well connected by planned and existing public transport and active travel routes, particularly in and surrounding urban centres and in areas of significant deprivation.</p>	<p><b>No Likely Significant Effects, screened out.</b></p> <p>It is considered that directing new development towards brownfield sites is positive, because this minimises the risk of losing functionally linked habitat for birds. There are no linking impact pathways for European sites. The policy contains the positive provision that planning applications will focus on the redevelopment of brownfield sites, rather than utilising greenfield sites. Therefore, any potential loss of functionally linked habitats will be less likely.</p>									
<b>Policy LCR SP4 - Strategic Infrastructure</b>	<p>1. Provision of the following key strategic infrastructure necessary to meet identified needs, serve new development and enable growth will be supported subject to other SDS and Local Plan policies:</p> <ol style="list-style-type: none"> <li>Enhancement to the electricity network, including to accommodate EV charging points, battery storage, and renewable energy technologies;</li> <li>Enhancement to the gas network to accommodate transition towards hydrogen for homes, businesses and transport;</li> <li>LCR Connect full fibre network with connectivity to Transatlantic cables;</li> <li>Cycling and walking routes (as identified in the LCR Local Cycling and Walking Infrastructure Plan (CWIP));</li> <li>Improvements and enhancements to the local passenger rail network (including new stations at Liverpool St.James/Baltic, Carr Mill and Headbolt Lane; and improvements/expansion at Liverpool Central and Liverpool Lime Street) and ongoing review of new station proposals;</li> <li>Improvement and enhancements to the regional freight rail network (including increasing capacity on the LCR and wider regional network);</li> <li>Parkside Strategic Rail Freight Interchange;</li> <li>Improvements to the Key Route and Major Route Network;</li> <li>Improvements to the Strategic Route Network, including the following locations which are expected to come under significant pressure and may require intervention: <ol style="list-style-type: none"> <li>Junction 23 of the M6 (with the East Lancashire Road A580)</li> <li>Junction 22 of the M6 (with the A57, A557 and A570)</li> <li>Junction 7 of the M62 (with the A572)</li> </ol> </li> </ol>	<p><b>Potential Likely Significant Effects</b></p> <p>This policy specifies areas where it will prioritise development. These developments could potentially create the following source receptor impact pathways:</p> <ul style="list-style-type: none"> <li>Loss of Functionally Linked Habitat should the development be located within 10km of SPAs;</li> <li>Increased recreational pressure/ disturbance;</li> <li>Reduction of Water Quality should the development discharge its waste through a Sewage Treatment Works within 8km upstream of a European Designated Site;</li> <li>Urbanisation should the development be located within 1km of a European site;</li> <li>Reduction of Air Quality should the development cause an increase in employment traffic on roads that pass within 200m of a nitrogen sensitive SAC.</li> </ul>									

Policy number/ name	Policy summary and proposed approach (full policy details can be found in the SDS document)	Likely Significant Effects Screening Assessment
	<p>iv. M57 / Knowsley Expressway corridor;</p> <p>2. The Combined Authority will work with Local Authorities, infrastructure providers and other partners to coordinate infrastructure provision and its funding to support future strategic development locations identified in the SDS.</p>	
<p><b>Policy LCR SP5 - City and Town Centres</b></p>	<p>1. The City Region's strategic network and hierarchy of centres will be defined as follows:</p> <p><b>Tier 1 – Regional/ National Centre</b></p> <ul style="list-style-type: none"> <li>• Liverpool City Centre</li> </ul> <p><b>Tier 2 – City Regional Town Centres</b></p> <ul style="list-style-type: none"> <li>• Birkenhead Town Centre</li> <li>• Southport Town Centre</li> <li>• St Helens Town Centre</li> <li>• Widnes Town Centre</li> </ul> <p><b>Tier 3 – Town Centres</b></p> <ul style="list-style-type: none"> <li>• Bootle Town Centre</li> <li>• Earlestown Town Centre</li> <li>• Halton Lea Town Centre</li> <li>• Heswall Town Centre</li> <li>• Huyton Town Centre</li> <li>• Kirkby Town Centre</li> <li>• Moreton Town Centre</li> <li>• Liscard Town Centre</li> <li>• Prescot Town Centre</li> <li>• Runcorn Town Centre</li> <li>• West Kirby Town Centre</li> </ul> <p>2. This network will provide the focus for retail, leisure, office, cultural, tourism, community, and where appropriate, residential development and uses proportionate to the centre's function and scale in order to promote long term vitality and viability.</p> <p>3. The balance of this network will be maintained with centres complementing and not undermining one another. Support will be given to plans, proposals and initiatives that seek to positively promote and regenerate centres, allowing for diversification reflective of their distinct characteristics and contribution within the network.</p>	<p><b>Potential Likely Significant Effects</b></p> <p>Although the policy does not promote a quantum of development in any one area the policy does highlight areas where it will prioritise certain type of employment development.</p> <p>Depending on the location of the development the increase in employment development within the Combined Authority could potentially create the following source receptor impact pathways:</p> <ul style="list-style-type: none"> <li>• Loss of Functionally Linked Habitat should the development be located within 10km of SPAs.</li> <li>• Reduction of Water Quality should the development discharge its waste through a Sewage Treatment Works within 8km upstream of a European Designated Site;</li> <li>• Urbanisation should the development be located within 1km of a European site; and,</li> <li>• Reduction of Air Quality should the development cause an increase in employment traffic on roads that pass within 200m of a nitrogen sensitive SAC.</li> </ul>

Policy number/ name	Policy summary and proposed approach (full policy details can be found in the SDS document)	Likely Significant Effects Screening Assessment
	<p>4. District, local and other smaller centres, as defined in Local Plans, will complement the network providing the focus for shops, services and other community uses at an appropriate scale to meet the needs of local communities.</p> <p>5. The extent of centre boundaries and any necessary allocations to meet identified needs will continue to be defined through Local Plans and kept under review in light of local evidence.</p> <p>6. The 'town centre first' approach will continue to be applied in the city region. Proposals for main town centre uses outside of defined centres and not in accordance with an up-to-date plan will be required to apply and satisfy the sequential test consistent with national planning policy.</p> <p>7. To prevent significant adverse impacts on the investment in, or viability and vitality of existing centres, proposals for retail and leisure development outside of defined centres and not in accordance with an up-to-date plan will need to satisfy the requirements of an impact assessment consistent with national planning policy and any locally set policy criteria.</p>	
<p><b>Policy LCR SP6 - Green and Blue Infrastructure</b></p>	<p>The city region's multifunctional network of green and blue infrastructure includes:</p> <ul style="list-style-type: none"> <li>a) Parks, gardens, playing fields, allotments, amenity and other open spaces;</li> <li>b) Countryside recreation areas and country parks;</li> <li>c) The coast (including sand dunes, intertidal mudflats, saltmarsh);</li> <li>d) Waterways, waterbodies and wetlands (including rivers and their tributaries, canals, lakes and reservoirs);</li> <li>e) Trees and woodland (including street/urban trees); <ul style="list-style-type: none"> <li>• Nature conservation sites and Priority Habitats comprising the Liverpool City Region Ecological Network;</li> <li>• Green corridors and Greenways, including paths and cycleways;</li> <li>• Green walls and roofs and other forms of 'urban greening'.</li> </ul> </li> </ul> <p>As a strategic asset, the long-term sustainability and beneficial use of this green and blue infrastructure network will be achieved by:</p> <ul style="list-style-type: none"> <li>a) Protecting, enhancing, restoring, managing and expanding the network, as appropriate, consistent with other SDS policies including Policy LCR DP4 and Policy DP7 and in accordance with national and local planning policy;</li> <li>b) Securing, where appropriate, well-designed, accessible and multifunctional green and blue infrastructure provision as a result of new development in line with any local requirements, along with long-term management arrangements;</li> </ul>	<p><b>No Likely Significant Effects, screened out.</b></p> <p>This is a general policy which does not promote or support any specific development but is designed to protect, enhance and expand the green and blue infrastructure network within the LCRCA area.</p>

Policy number/ name	Policy summary and proposed approach (full policy details can be found in the SDS document)	Likely Significant Effects Screening Assessment
	<p>c) Supporting opportunities to improve integration and connectivity between the network, including green corridors and Greenways, to allow safe, continuous access and enable active travel;</p> <p>d) Securing opportunities to enhance the quality, connectivity and resilience of the LCR Ecological Network and Nature Improvement Areas as the focus for strategic nature recovery in the city region (pending a future LCR Local Nature Recovery Strategy and Nature Recovery Network);</p> <p>e) Promoting a Natural Capital and ecosystem services approach to plan making and decision taking in order to prioritise and identify strategic and local opportunities for green and infrastructure benefits including habitat provision/improvement;</p> <p>f) Supporting measures and opportunities for sustainable water and flood risk management</p> <p>f) Working with Mersey Forest and other partners in support of strategic initiatives to deliver increased tree cover and urban greening including the 'Northern Forest';</p>	
<p><b>Policy LCR SP7 - International Connectivity</b></p>	<p>The sustainable growth of key strategic assets enabling international connectivity (as set out in a) – e) below) will be supported subject to other relevant SDS policies, with particular regard to:</p> <p>i. Mitigating climate change and achieving net zero carbon;</p> <p>ii. Fully addressing any impacts on the natural and historic environment;</p> <p>iii. Supporting inclusive economic growth; and</p> <p>iv. Addressing any adverse impacts on local communities including amenity and health.</p> <p>a) Liverpool John Lennon Airport - operation and expansion together with a sustainable access solution.</p> <p>b) Network of maritime ports on the River Mersey - operation and expansion together with a sustainable multi-modal access solution to the Port of Liverpool.</p> <p>c) LCR Freeport – development of the associated tax and custom sites together with sustainable multi-modal access solutions linking the sites to the national transport network.</p> <p>d) Cruise Liner Terminal – development of a permanent terminal facility.</p> <p>e) Manchester Ship Canal – development enabling the waterway's operation for the sustainable transport of freight between Greater Manchester, the LCR and further afield.</p>	<p><b>Potential Likely Significant Effects</b></p> <p>This policy specifies areas where it will prioritise development. These developments could potentially create the following source receptor impact pathways:</p> <ul style="list-style-type: none"> <li>• Loss of Functionally Linked Habitat should the development be located within 10km of SPAs;</li> <li>• Reduction of Water Quality should the development discharge its waste through a Sewage Treatment Works within 8km upstream of a European Designated Site;</li> <li>• Urbanisation should the development be located within 1km of a European site;</li> <li>• Reduction of Air Quality should the development cause an increase in employment traffic on roads that pass within 200m of a nitrogen sensitive SAC.</li> <li>• Disturbance – noise/ visual</li> </ul>
<p><b>Policy LCR SP8 - River Mersey and the Coast</b></p>	<p>Development relating to the River Mersey and the city region's coast will be expected to contribute towards their long-term sustainability. This will be achieved by:</p> <p>a) Supporting proposals for the sustainable development of the city region's maritime port network, in particular, where this enables and facilitates low carbon modes of transportation for the movement of goods and freight (with regard to Policy LCR SP7 International Connectivity);</p> <p>b) Supporting the ambition of generating renewable tidal marine energy;</p> <p>c) Supporting the regeneration initiatives of coastal/riverside urban areas and towns, including through the promotion of the visitor economy and sustainable tourism;</p>	<p><b>Potential Likely Significant Effects</b></p> <p>This policy specifies areas where it will prioritise development. These developments could potentially create the following source receptor impact pathways:</p> <ul style="list-style-type: none"> <li>• Recreational pressure on European sites</li> <li>• Loss of Functionally Linked Habitat should the development be located within 10km of SPAs;</li> </ul>



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	<p>d) Protecting the designated coastal and estuarine nature conservation sites and their functionally linked land consistent with Policy LCR DP7 The Natural Environment and Nature Recovery and relevant legislation;</p> <p>e) Proactively managing recreational pressure on the LCR coast and adverse effects on internationally protected sites as a result of new development, including through securing appropriate mitigation measures on the non-designated coast and other green and blue infrastructure (including Suitable Alternative Natural Greenspaces (SANGs) across the LCR) to be set out in the emerging LCR Recreational Mitigation on the Coast Supplementary Planning Document;</p> <p>f) Ensuring development does not lead to adverse impacts on water quality (including on dune aquifers and bathing water) and where possible improves water quality;</p> <p>g) Working with partners in the achievement of River Basin Management Plan measures and objectives and the LCR objective to eliminate untreated discharge into the River Mersey by 2030;</p> <p>h) Ensuring development does not increase the risk of tidal flooding or coastal erosion, or result in adverse effects on coastal processes or the ability of the natural coast to form a natural sea defence (in line with specific Local Plan policies relating to Coastal Change Management Areas where defined);</p> <p>i) Supporting proposals for new coastal flood defences and flood risk management measures (with regard to the Shoreline Management Plan), and essential landfill facilities for offshore installations, including renewable energy;;</p> <p>j) Increasing, enhancing and preserving public access to and along the waterfront and coastline and creating uninterrupted active travel routes;;</p> <p>k) Ensuring the design and layout of new waterfront development responds positively and appropriately to its setting including through use of materials, retention of historic features, integration with footpaths/active travel routes, access to waterways, public realm and landscaping.</p>	<ul style="list-style-type: none"> <li>• Reduction of Water Quality should the development discharge its waste through a Sewage Treatment Works within 8km upstream of a European Designated Site;</li> <li>• Urbanisation should the development be located within 1km of a European site;</li> <li>• Reduction of Air Quality should the development cause an increase in employment traffic on roads that pass within 200m of a nitrogen sensitive SAC.</li> <li>• Disturbance – noise/ visual</li> </ul>
<p><b>Policy LCR SP9 – Culture, Tourism and Visitor Attractions</b></p>	<p>Support to the visitor economy and the promotion of cultural activity and sustainable tourism will be achieved through:</p> <p>a) The protection, enhancement and expansion of the city region’s range of cultural and tourism assets and visitor attractions as appropriate, consistent with other policies in the SDS;</p> <p>b) Expecting new tourism development to demonstrate the benefits of investment to the local economy including local job creation and delivery of wider Social Value to local communities (consistent with Policy LCR DP16 Delivering Social Value);</p> <p>c) Ensuring tourism and visitor attractions can be accessed by sustainable transport and active travel modes including walking, cycling and public transport;</p> <p>d) Supporting provision of sustainable transport connections to key transport gateways including airports, train stations and cruise ship and ferry terminals;</p> <p>e) Encouraging the co-location of visitor attractions, where appropriate, to create hubs;</p> <p>f) Supporting the provision of ancillary facilities including hotels and other types of accommodation consistent with Policy LCR SP5 City and Town Centres and other SDS and Local Plan policies ;</p> <p>g) Supporting opportunities for ‘green’ or ‘eco’ tourism and its associated development where appropriate;</p>	<p><b>No Likely Significant Effects, screened out.</b></p> <p>This policy can be screened out on the basis of activities being consistent with Policy LCR DP7 The Natural Environment and Nature Recovery, as stated within Policy LCR SP9 text itself.</p>

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	<p>h) Addressing any adverse effects or significant harm development may have on sites designated for nature or geological conservation, including visitor pressure, and where appropriate securing measures for mitigation or compensation consistent with Policy LCR SP8 River Mersey and the Coast and Policy LCR DP7 The Natural Environment and Nature Recovery;</p> <p>i) Recognising the cultural significance of the city region's historic environment and its importance to the visitor economy, fully addressing any impacts and harm to heritage assets and their setting consistent with Policy LCR DP14 The Historic Environment;</p> <p>h)</p> <p>j) Applying the 'agent of change' principle to help secure the long-term future of cultural assets and activities;</p>	
<p><b>Policy LCR SP10 - Rural City Region</b></p>	<p>In rural areas, the long-term sustainability of communities, the economy and the environment (both natural and built) will be achieved by:</p> <p>a) Supporting proposals that would facilitate the diversification of the rural economy and create employment opportunities, including for leisure and tourism, where appropriate;</p> <p>b) Protecting existing rural employment sites unless they can be demonstrated to be unviable and promoting the re-use of existing buildings;</p> <p>c) The application of national Green Belt policy where relevant in both plan-making and in the determination of planning proposals;</p> <p>d) Ensuring the protection, enhancement or restoration of rural landscape character with regard to local evidence;</p> <p>e) Protecting and enhancing the public rights of way network, including long distance routes and linkages to them, allowing for recreation opportunities and access to services and facilities by walking, cycling and other active travel;</p> <p>f) Securing opportunities to improve public transport service provision.</p> <p>g) Preventing the loss of best and most versatile agricultural land unless development needs can be clearly justified;</p> <p>h) Preventing the erosion and degradation of soil resources through use/encouragement of sustainable soil management approaches to development, agriculture and natural flood risk management;</p> <p>i) Ensuring rural village and other conservation areas and their settings are preserved or enhanced with regard to each area's distinct character and appearance;</p> <p>j) Protecting provision of local services and facilities;</p> <p>k) Supporting provision of high-speed internet;</p> <p>l) Supporting the provision of renewable energy, where appropriate subject to other SDS policies, national planning policy and Local Plan policies.</p>	<p><b>No Likely Significant Effects, screened out.</b></p> <p>This is a general policy which does not promote or support any specific development but is designed to ensure the long-term sustainability of rural communities within the City Region.</p>
<p><b>Development Principles</b></p>		
<p><b>Policy LCR DP1 - Planning for Climate Change</b></p>	<p>As a priority, development plans and proposals should be making the fullest possible contribution towards the mitigation of climate change and adaption to its effects as set out below.</p>	<p><b>No Likely Significant Effects, screened out</b></p>

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	<p><b>Climate Change Mitigation</b></p> <p>1. Minimising greenhouse gas emissions and maximising carbon storage in order to help reach the Liverpool City Region’s target of net zero carbon by 2040 and mitigate climate change. Supported measures to achieve this will include:</p> <ul style="list-style-type: none"> <li>a) Securing development that minimise car dependency and promote active travel and the use of public transport;</li> <li>b) Facilitating the decarbonisation of transport for the movement of people and goods and supporting the transition to zero and low carbon vehicles through the provision of appropriate infrastructure;</li> <li>c) Facilitating the development of green industries in the city region and supporting decarbonisation of existing industries;</li> <li>d) Facilitating the decarbonisation of energy supply networks/systems and increasing provision of energy from renewable and zero carbon energy sources;</li> <li>e) Facilitating the sustainable management of waste and promoting the circular economy;</li> <li>f) Maximising the energy efficiency of new and existing buildings and reducing the whole life-cycle carbon emissions of new development;</li> <li>e) Securing opportunities for long term carbon sequestration and storage through nature-based solutions such as the creation, restoration and protection of peatland, woodland, saltmarsh and other ‘carbon store’ habitats;</li> <li>f</li> </ul> <p><b>Climate Change Adaptation</b></p> <p>2. Increasing the City Region’s ability to adapt to climate change and improve the long-term resilience of communities, businesses, infrastructure and the natural environment to withstand its impacts. Supported measures to achieve this will include:</p> <ul style="list-style-type: none"> <li>a) Protecting the integrity of flood defences and directing vulnerable development away from areas of coastal change and other flood risk;</li> <li>b) The incorporation, from an early stage, of green and blue Infrastructure within development providing climate change mitigation benefits such as carbon sequestration and storage, natural flood risk management, urban cooling, Sustainable Drainage Systems (SuDS) and surface water run-off reduction;</li> <li>c) The incorporation, from an early stage, into the design and layout of new development and infrastructure of climate change adaptation measures such as water recycling and efficiency, flood and heat resistance and resilience, thermal efficiency, urban cooling and solar gain.</li> <li>d) The recovery of nature and species through the protection, enhancement and creation of habitats;</li> </ul>	<p>This policy is a strategic development management policy that sets out the criteria for developers to attain climate change targets within their development and to future protect development from the effects of climate change e.g., sea level rise etc. As well as futureproofing built development the policy also sets out Green Infrastructure networks will also need to be protected and enhanced to ensure they are resilient to future climate changes.</p> <p>The policy does not provide a quantum of development nor does it pertain to development in particular areas of the City Region.</p>

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<p><b>Policy LCR DP2 - Sustainable and Inclusive Communities</b></p>	<p>Development plans and proposals should contribute positively towards the creation of sustainable and inclusive communities.. This will be achieved by:</p> <ul style="list-style-type: none"> <li>a) The provision of high-quality new homes of an appropriate and balanced mix of types, tenures, and size to meet identified local needs across the city region;</li> <li>b) Supporting the provision of specialist housing for older people, or groups with particular housing needs, and ensuring this is in sustainable and accessible locations;</li> <li>c) Securing the provision of affordable housing in line with locally assessed needs ensuring any provision is of an appropriate type, tenure and size; the level of provision of affordable housing should be consistent with Local Plan viability evidence and subsequent local planning policy requirements;</li> <li>d) Setting requirements for new build homes to meet standards for accessibility and adaptability for wheelchair users (consistent with Parts M4(2) and M4(3)(2)(a) of Building Regulations 2010) with regard to local viability evidence and site specific considerations;</li> <li>e) Meeting any locally assessed identified need for Gypsy, Traveller and Travelling Show People accommodation in appropriate, sustainable and accessible locations and preventing the unnecessary loss of existing sites;</li> <li>f) Supporting the provision of self-build and custom-build homes in sustainable and appropriate locations with regard to local evidence and planning policies.</li> </ul>	<p><b>No Likely Significant Effects, screened out</b></p> <p>This policy is a strategic development management policy that sets out the criteria for developers to create sustainable, inclusive communities.</p>
<p><b>Policy LCR DP3 - Economic Prosperity</b></p>	<p>Development plans and proposals should plan positively to support sustainable economic growth in the city region in order to attract investment, promote innovation, improve productivity, increase opportunity and reduce inequalities. This will be achieved by:</p> <ul style="list-style-type: none"> <li>a) The provision of sufficient employment land to meet identified needs as set out in Policy LCR SP2;</li> <li>b) Supporting the sustainable growth of key sectors of the city region economy, particularly: <ul style="list-style-type: none"> <li>(i) Health and life sciences, materials chemistry, advanced manufacturing, digital and technology, maritime, visitor and tourism, arts and culture, film and television, logistics and distribution, research and development intensive organisations, financial and profession services, and green industries.</li> <li>(ii) Social economy uses (including where justified measures to help protect them, particularly in areas of deprivation) and micro, small and medium enterprises;</li> </ul> </li> <li>c) Supporting opportunities for industries to cluster in a way that maximises wider economic, environmental and social benefits, including the Liverpool City Region Freeport Sites and the Liverpool City Region Life Sciences Investment Zone, subject to relevant policies in this SDS and Local Plans;</li> <li>d). Supporting the sustainability and resilience of:</li> </ul>	<p><b>No Likely Significant Effect, screened out</b></p> <p>This is a broad policy relating to the City Region’s economy. Whilst it is noted that economic growth has potential to impact upon European designated sites (atmospheric pollution and water resource conflicts), this policy does not explicitly provide for development, it merely provides criteria for the Mayor and partners.</p>

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	<p>(i) Key employment sites required to meet employment needs by ensuring their protection from other uses where necessary, particularly sites that are/or can be served by rail and/or water borne freight movements;</p> <p>(ii) The city region's city and town centre network as a primary location for commercial, culture, retail, leisure, tourism, public services and social organisations, socialising, complemented by high quality homes that meet a range of needs;</p> <p>(iii) The rural economy, including supporting its diversification (consistent with national policy).</p> <p>e). Delivery of shared prosperity, including through supporting:</p> <p>(i) High quality employment opportunities for all members of the community, including opportunities to secure social value and enhance employment skills and qualifications through new development;</p> <p>(ii) Public transport infrastructure commitments to improve connectivity;</p> <p>(iii) Fast and reliable digital infrastructure particularly in underserved areas that are digitally excluded;</p> <p>(iv) Investment in the most deprived areas in a way that secures lasting improvements for local residents, communities and local businesses.</p>	
<p><b>Policy LCR DP4 - Promoting Health and Wellbeing</b></p>	<p>As a priority, development plans and proposals should plan positively to reduce health and wellbeing inequalities and allow for healthy and active lifestyles to be led. This will be achieved by:</p> <p>a) Working in partnership with healthcare agencies and other partners to help achieve the goals, objectives and needs identified in health and wellbeing strategies and needs assessments;</p> <p>b) Facilitating the effective operation of the city region's healthcare infrastructure to meet and respond to community needs, including provision of new or improved facilities where appropriate;</p> <p>c) Requiring development proposals defined as of 'potential strategic importance' to be informed and accompanied by a Health Impact Assessment prepared at an early stage of the development process to improve health outcomes;</p> <p>d) Protecting the city region's network of public open spaces, playing fields, outdoor sports and recreation facilities and, where appropriate, seek enhancements or new provision with regard to local quantity, quality and accessibility standards;</p> <p>e) Maximising opportunities for access to public open space and green infrastructure within walking distance of housing, employment, health and education establishments and town centres;</p> <p>f) Securing high standards of energy efficiency in new and existing homes particularly in the interests of affordable warmth;</p> <p>g) Securing opportunities to increase access to healthy food and restricting the proliferation, location and operation of hot food takeaways and other uses demonstrated to exacerbate poor health and health inequalities where a clear, evidenced link to negative health impacts on younger and vulnerable people has been shown;</p>	<p><b>No Likely Significant Effects, screened out.</b></p> <p>This policy is a strategic development management policy that set out the criteria to produce better, healthier, inclusive, high-quality and distinctive places to live.</p> <p>The policy does not provide a quantum of development nor does it pertain to development in particular areas of the City Region.</p>

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	<p>h) Protecting or providing allotments where appropriate and supporting other small-scale food growing opportunities such as community gardens/orchards, green roofs and other appropriate green infrastructure;</p>	
<p><b>Policy LCR DP5 – Impacts on Health</b></p>	<p>Development plans and proposals should plan positively to ensure that adverse impacts on human health are avoided or mitigated. This will be achieved by:</p> <ul style="list-style-type: none"> <li>a) Securing opportunities to improve, and minimise the impacts on air quality from new development, ensuring that proposals do not lead to any significant deterioration in air quality, impede the objectives of an Air Quality Management Area or Action Plan, or lead to the declaration of a new Air Quality Management Area;</li> <li>b) Ensuring risks to people's health, both immediate and long term, caused by flooding or coastal erosion, land instability or land contamination are minimised through the appropriate location and design of new development;</li> <li>c) Ensuring development does not have an unacceptable impact on health, including by air, water, light and noise pollution, nuisance, dust, odours, vibration, land instability and land contamination;</li> <li>d) Applying the 'Agent of Change principle' where existing established uses could have significant adverse health effects on users or occupiers of new development;</li> <li>e) Ensuring development does not adversely impact residential amenity or the amenity or operation of existing businesses, or would result in unacceptable impacts from traffic.</li> </ul>	<p><b>No Likely Significant Effects, screened out.</b></p> <p>This policy is a strategic development management policy that set out the criteria to produce better, healthier, inclusive, high-quality and distinctive places to live.</p> <p>The policy does not provide a quantum of development nor does it pertain to development in particular areas of the City Region.</p>
<p><b>Policy LCR DP6 - High Quality Design</b></p>	<p>Development plans and proposals should deliver high-quality buildings and places design that are attractive, inclusive, healthy, safe and environmentally sustainable. This will be achieved by:</p> <ul style="list-style-type: none"> <li>a) Following a design-led approach that responds positively to local character and distinctiveness, including townscape and landscape, and its wider setting through its appearance and design, density, use and choice of construction materials;</li> <li>b) Where appropriate, setting detailed design requirements, such as design guides, independent design review panels, design codes, masterplans and design competitions;</li> <li>c) Integrating design measures that help mitigate and adapt to climate change, including high energy efficiency performance, water resource efficiency, green and blue infrastructure and flood risk management;</li> <li>d) Incorporating active design principles to help promote healthy lifestyles for all ages including the facilitation of active travel;</li> <li>e) Providing opportunities for social interaction as part of new development including through the provision of new, or integration with existing community facilities and public spaces;</li> <li>f) Ensuring that employment related development is designed to achieve a healthy and safe working environment for its users and employees;</li> </ul>	<p><b>No Likely Significant Effects, screened out.</b></p> <p>This policy is a strategic development management policy that sets out the criteria to produce better, healthier, inclusive, high-quality and distinctive places to live.</p> <p>The policy does not provide a quantum of development nor does it pertain to development in particular areas of the City Region.</p>

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	<p>g) Ensuring that development is proportionate in size and scale and does not result in an adverse impact on visual amenity;</p> <p>h) Ensuring acceptable levels of amenity, outlook, privacy, sunlight, and daylight for future and neighbouring occupants;</p> <p>i) Maximising the resilience of buildings and minimise potential physical safety risks, including those arising as a result of extreme weather, fire, flood and related hazards, incorporating any necessary measures at the earliest possible stage of the design process;</p> <p>j) Ensuring safe access is provided for emergency vehicles and servicing requirements associated with development;</p> <p>k) Ensuring development is designed to minimise waste, utilising reclaimed and recycled construction materials where appropriate and facilitating the source separation, storage, collection and recycling of waste during use.</p>	
<p><b>Policy LCR DP7 - The Natural Environment and Nature Recovery</b></p>	<p>In recognition of its importance in supporting nature recovery, mitigating and adapting to climate change and offering health and wellbeing benefits, development plans and proposals should plan positively for the city region's natural environment by:</p> <p>a) Ensuring green and blue infrastructure is protected, enhanced, maintained and expanded in an integrated way with opportunities to for public access secured where appropriate;</p> <p>b) Expecting development to complement, restore or enhance landscape character as appropriate and mitigate any impacts with regard to local evidence;</p> <p>c) Protecting identified sites designated for their nature and/or geological conservation importance with the highest level of protection given to international and then national and local designations (in accordance with relevant legislation and consistent with national planning policy);</p> <p>d) Requiring development that is likely to have a significant effect on an internationally important site, including functionally linked land, to be subject to a Habitats Regulations Assessment, unless the development is directly connected with or necessary to the management of the site. Development that has an adverse effect on internationally important sites will only be permitted where it is demonstrated through an Appropriate Assessment that additional mitigation is sufficient to avoid likely significant effects, and the Integrity Test is met. If the Integrity Test is not met, development must demonstrate that there are no suitable alternatives and any imperative reasons of overriding public interest, and provide suitable compensatory provision;</p> <p>e) Following the 'mitigation hierarchy' (consistent with national planning policy) whereby if significant harm resulting from development on biodiversity cannot be avoided then this must be minimised, adequately mitigated, or, as a last resort, compensated;</p> <p>f) Targeting the location of any appropriate mitigation, replacement or compensation measures using a sequential approach as follows (in order of preference):</p> <p>(i) The development site;</p> <p>(ii) The immediate locality and / or within the LCR Ecological Network and/ or Nature Improvement Area;;</p>	<p><b>No Likely Significant Effects, screened out</b></p> <p>This policy is a strategic development management policy that sets out the criteria for City Region's ambitions for nature's recovery and also provides the policy framework for avoiding adverse impacts in the integrity of protected sites.</p>

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	<p>(iii) Locations that fall within the LCR Ecological Network and/ or Nature Improvement Area and within the local authority area; and</p> <p>(iv) Locations that fall within the LCR Ecological Network and/ or Nature Improvement Area within the city region;</p> <p>(v) Other ecologically appropriate locations within the city region.</p> <p>g) Ensuring development within the LCR Nature Improvement Area enables or contributes towards its effective functioning, and contributes to the creation and/or management of habitats as set out in the Nature Improvement Area Focus Area Profiles;</p> <p>h) Requiring an Ecological Appraisal for development proposals that would nationally or locally designated nature conservation site, Priority Habitat(s), legally protected species or Priority Species;</p> <p>i) Securing the provision of a minimum 10% 'Biodiversity Net Gain' as a result of new development, to be delivered on-site or, where not possible, off-site following the sequential approach outlined under f), guided by the LCR Ecological Network/ Nature Improvement Areas and LCR Local Nature Recovery Strategy (when prepared);</p> <p>j) Encouraging and supporting proposals that would achieve greater than 10% Biodiversity Net Gain and Marine Net Gain as appropriate subject to consistency with other SDS and Local Plan policies;</p> <p>k) Preventing the unacceptable loss or damage of trees and woodland as a result of development, securing replacements where appropriate;</p> <p>l) Ensuring development does not give rise to unacceptable impacts (including cumulatively) on the natural environment in terms of pollution (including air quality, water quality, light and noise), contamination, land instability or degradation.</p>	
<p><b>Policy LCR DP8 - Making the Best Use of Land</b></p>	<p>Development plans and proposals should ensure the efficient and effective use of land. This will be achieved by:</p> <p>a) Promoting and supporting the development of suitable underutilised and previously developed/brownfield land to meet identified needs (consistent with LCR SS1 Spatial Strategy, LCR SP3 Brownfield Deliverability and Regeneration and LCR DP10 Sustainable Travel and Transport);</p> <p>b) Recognising and promoting the value of existing buildings, places and assets as a catalyst for place-based regeneration;</p> <p>c) Taking opportunities to utilise and integrate with existing infrastructure assets;</p> <p>d) Proactively exploring the potential to intensify the use of land for an appropriate mix of homes or places of employment, promoting higher density development where appropriate;</p> <p>e) Applying a design-led approach to determine the optimum development capacity of sites;</p> <p>f) Recognising the role and potential of some previously developed/brownfield land for a range of sustainable uses including green and blue infrastructure, sustainable transport or low-carbon/renewable energy generation where appropriate;</p> <p>g) Tackling land contamination and stability issues with appropriate mitigation and remediation.</p>	<p><b>No Likely Significant Effects, screened out</b></p> <p>This policy is a strategic development management policy that sets out the criteria for developers to make the most effective and appropriate use of land, buildings and existing infrastructure.</p>



Policy number/ name	Policy summary and proposed approach (full policy details can be found in the SDS document)	Likely Significant Effects Screening Assessment
<b>Policy LCR DP9 – Infrastructure Provision</b>	<p>Development plans and proposals should support and contribute positively towards the creation of sustainable places that are well served by the range of infrastructure needed. This will be achieved by:</p> <p>a) Ensuring that development is served and supported by the infrastructure necessary to meet the needs of its users and secure the provision of new, replacement or enhanced infrastructure where necessary. This includes (in no particular order) but not limited to:</p> <ul style="list-style-type: none"> <li>• Social infrastructure including education, healthcare, community facilities, built sports and recreation facilities;</li> <li>• Green and blue infrastructure, including public open space and outdoor sports provision;</li> <li>• Public rights of way including walking and cycling paths, routes and networks;</li> <li>• Public transport infrastructure;</li> <li>• Highways infrastructure;</li> <li>• Utilities, including water, wastewater, electricity and digital.</li> </ul> <p>b) Ensuring that development integrates with existing infrastructure where feasible;</p> <p>c) Protecting existing infrastructure from loss, and safeguarding land for future planned infrastructure where a need has been identified;</p> <p>d) Where appropriate and subject to viability considerations, requiring developers to provide necessary infrastructure directly or securing contributions (including provision for long-term, on-going management and maintenance where appropriate) through appropriate mechanisms such as Section 106 or Section 278 agreements, Community Infrastructure Levy (CIL) or other potential future tariffs/levies, in accordance with national planning policy and relevant legislation;</p> <p>e) Ensuring infrastructure is delivered in a co-ordinated and programmed way in order for service or capacity provision to align with development phasing and minimise any impacts on local communities.</p>	<p><b>No Likely Significant Effects, screened out</b></p> <p>This policy is a strategic development management policy that sets out the criteria for developers to ensure the creation of sustainable places with the required infrastructure.</p>
<b>Policy LCR DP10 - Sustainable Transport and Travel</b>	<p>Development plans and proposals should plan positively to improve transport connectivity across the city region in ways that enable sustainable growth, promote modal shift, reduce carbon emissions, improve air quality and ensure safety. This will be achieved by:</p> <p>a) Securing patterns of development that allow people access to a good range of jobs, services, facilities and recreation opportunities through a choice of sustainable and active travel modes;</p> <p>b) Maximising opportunities for development to be served and accessed by sustainable modes of transport wherever practicable, guided by the priorities of the Sustainable Transport Hierarchy’;</p>	<p><b>No Likely Significant Effects, screened out</b></p> <p>This policy is a strategic development management policy that sets out the criteria for developers to plan for improved transport connectivity. It is also essentially an air quality positive policy.</p>

Policy number/ name	Policy summary and proposed approach (full policy details can be found in the SDS document)	Likely Significant Effects Screening Assessment
	<ul style="list-style-type: none"> <li>c) Ensuring, through site layout and design, that access to sustainable transport modes is convenient, safe, attractive and of a high quality;</li> <li>d) Ensuring potential transport related impacts of development proposals including network capacity, safety, accessibility, carbon emissions, air quality, noise and other amenity issues are fully addressed with the requirement to submit Transport Assessments or Statements as appropriate;</li> <li>a) Guiding development to locations that are genuinely accessible, or can be made accessible, by walking, cycling and other sustainable modes of transport;</li> <li>;</li> <li>e) Ensuring development proposals manage travel demand and maximise of sustainable transport with the requirement to submit a Travel Plan as appropriate;</li> <li>f) Maintaining and making best use of existing transport network assets and securing improvements where appropriate (with regard to other policies in the SDS);</li> <li>g) Supporting and promoting the sustainable movement of goods and freight including use of rail and/or water borne transport and encouraging freight and logistics developments to be multimodal;</li> <li>h) Support sustainable 'last mile solutions' that are consistent with the Sustainable Transport Hierarchy;</li> <li>i) Protecting public rights of way and where necessary, securing improvements to and integration with the existing network such as new connections or linkages';</li> <li>j) Safeguarding potential routes for active travel and other sustainable modes of transport;</li> <li>k) Requiring new development to provide electric vehicle charging points and/ or infrastructure,with appropriate regard to any local parking or infrastructure standards;</li> <li>l) Requiring new development to provide, where appropriate, convenient, safe and secure facilities for cycle and other travel users.</li> </ul>	
<p><b>Policy LCR DP11 - Energy</b></p>	<p>Development plans and proposals should contribute towards the reduction of carbon associated with energy generation and consumption, minimising energy costs to communities and businesses. This will be achieved by:</p> <ul style="list-style-type: none"> <li>a) Supporting proposals for the provision of renewable or low carbon energy and associated infrastructure (including battery/storage facilities) subject to fully addressing potential adverse impacts including amenity, health, landscape, the built and natural environment and national Green Belt policy;</li> <li>b) Supporting opportunities for the development of and/or connection to decentralised local renewable or low carbon energy provision such as district heat networks where feasible, informed by relevant evidence;</li> <li>c) Promoting sustainable energy consumption in new development in accordance with the following Energy Hierarchy whereby development should (in priority order):</li> </ul>	<p><b>No Likely Significant Effect., screened out.</b></p> <p>This policy promotes the development of the City Region's energy system, but does not specifically identify any location, or type of energy related development. Dependant on the location or type of development, potential impact pathways could exist (such as changes in hydrology, disturbance from construction/ operational activities, interrupting flightlines), however this policy does not provide specifically for any location or type of development. Moreover, it also has positive air quality dimensions regarding reduction of NOx emissions. As such there are no impact pathways present.</p>

Policy number/ name	Policy summary and proposed approach (full policy details can be found in the SDS document)	Likely Significant Effects Screening Assessment
	<ul style="list-style-type: none"> <li>i. Minimise energy demand;</li> <li>ii. Maximise energy efficiency;</li> <li>iii. Utilise renewable energy;</li> <li>iv. Utilise low carbon energy; and</li> <li>v. Utilise other energy sources.</li>   <li>d) Ensuring all new development for housing, employment and other uses provide high standards of sustainable design, construction and energy efficiency, setting through Local Plans where appropriate minimum renewable or low carbon energy requirements where viable and feasible;</li> <li>e) Supporting and facilitating the retrofitting of existing buildings, where appropriate, to improve energy efficiency and/or allow for renewable energy generation (where planning permission is required) ;</li> <li>f) Supporting the provision of electric and ultra-low emission vehicle charging or refuelling infrastructure taking full account of network capacity and demand and safety.</li> </ul>	
<p><b>Policy LCR DP12 - Resources</b></p>	<p>Development plans and proposals should contribute towards the sustainable and efficient use of resources and facilitate the move towards a circular economy. This will be achieved by:</p> <ul style="list-style-type: none"> <li>a) Minimising the generation of waste and ensuring it is managed in accordance with the Waste Hierarchy, contributing towards achieving city regional and national waste targets (as identified in the Merseyside &amp; Halton Joint Waste Local Plan 2013 (or replacement documents), Merseyside Recycling and Waste Authority Strategy and nationally);</li> <li>b) Ensuring that the city region's strategic network of waste management infrastructure is safeguarded and/or protected to meet identified needs consistent with the Merseyside and Halton Joint Waste Local Plan 2013 (or replacement documents);</li> <li>c) Maximising opportunities to recycle and re-use materials during construction and/or demolition to minimise waste and reduce embodied carbon;</li> <li>d) Prioritising the use of secondary and recycled materials wherever practicable to minimise primary mineral extraction;</li> <li>e) Facilitating a steady and adequate supply of aggregate minerals as appropriate in contribution towards sub-regional needs with regard to Local Aggregate Assessments;</li> <li>f) Ensuring that known mineral resources and associated supply infrastructure, including for secondary and recycled aggregate material, are identified and safeguarded as appropriate in Local Plans consistent with national planning policy;</li> </ul>	<p><b>No Likely Significant Effect., screened out.</b></p> <p>The Combined Authority has set out its commitment to a circular economy in its Plan for Prosperity 2022. This is driven by the principles of resource efficiency, minimising waste and maximising the re-use and value of the materials and products the city region has. In turn this provides benefits of reduced carbon/greenhouse gas emissions, reduced pollution and fewer/lesser impacts on the natural environment and wildlife.</p> <p>This is a positive policy that also highlights other key environmental benefits of soil resources including supporting biodiversity, carbon storage and water/flood risk management and the need to protect and restore these resources as appropriate. As such there are no impact pathways present.</p>

Policy number/ name	Policy summary and proposed approach (full policy details can be found in the SDS document)	Likely Significant Effects Screening Assessment
	<ul style="list-style-type: none"> <li>g) Ensuring minerals development does not have unacceptable adverse impacts on the natural or historic environment, water resources, amenity and/or human health and safety;</li> <li>h) Ensuring appropriate high-quality restoration and aftercare of mineral sites;</li> <li>i) Ensuring the protection, sustainable management and where possible restoration of valuable soil resources for food production or other environmental benefits.</li> </ul>	
<p><b>Policy LCR DP13 – Water Management and Flood Risk</b></p>	<p>Development plans and proposals should plan positively to ensure an integrated approach to water management to improve water quality, water resources and reduce the risk of flooding, both currently and in the future, for people and wildlife. This will be achieved by:</p> <ul style="list-style-type: none"> <li>a) Directing development away from areas at risk of flooding and managing the risk of flooding onsite and elsewhere now and in the future, through the application of the sequential and exception tests, and with regard to Strategic Flood Risk Assessments in accordance with national planning policy and guidance;</li> <li>b) Improving the water environment by returning watercourses to a more improved 'natural' state, where practicable;</li> <li>c) Assessing the impacts of climate change on the water environment and providing appropriate measures to mitigate the effects for people and wildlife;</li> <li>d) Supporting opportunities for sustainable water and flood risk management through natural flood management to slow the flow, provide flood storage, protect against a flood, and improve water quality;</li> <li>e) Where mitigation and / or natural flood management schemes are proven to not be practical, new flood defences or contributions to improve the performance of existing defences may be considered acceptable where they comply with flood management strategies and Shoreline Management Plans, and provide wider sustainable flood defence benefits and their future operation, management and maintenance over their lifetime can be secured;</li> <li>f) The provision and adoption of multifunctional Sustainable Drainage Systems (SuDS) with agreed management and maintenance for their life, that reduce run-off rates, improve water quality, provide for nature conservation and recreational uses where practical, following the targeted sequential approach to discharge of surface water as set out in local requirements or where these have not been adopted, in national planning policy or guidance;</li> <li>g) Improving surface and groundwater quality and quantity in compliance with the North West River Basin Management Plan and protecting water resources for public supply including Groundwater Source Protection Zones, consistent with advice from statutory bodies and utilities providers. and providing better or more infiltration to recharge groundwaters where practical and safe;</li> <li>h) Ensuring development does not compromise the operation of water supply, wastewater treatment and flood defence infrastructure assets;</li> <li>i) Encouraging and supporting measures to maximise water resource conservation and efficiency in new development;</li> <li>j) Ensuring existing and future infrastructure, including the highway and rail network, is resilient to flood risk and designed to minimise and mitigate its potential impacts.</li> </ul>	<p><b>No Likely Significant Effect., screened out.</b></p> <p>This policy sets out the key strategic measures for managing water sustainably in the city region, addressing the risks water can pose and recognising its value as a vital natural resource.</p>

Policy number/ name	Policy summary and proposed approach (full policy details can be found in the SDS document)	Likely Significant Effects Screening Assessment
<p><b>Policy LCR DP14 – The Historic Environment</b></p>	<p>In recognition of its importance in providing quality of place, maintaining cultural and economic vitality, and bestowing social wellbeing, development plans and proposals should plan positively for the city region’s historic environment by:</p> <ul style="list-style-type: none"> <li>a) Demonstrating an understanding of the historic environment and heritage value of development sites and surrounding areas;</li> <li>b) Maximising the opportunities provided by the historic environment in regeneration, place making and other strategic initiatives to enhance local character and distinctiveness;</li> <li>c) Conserving heritage assets in a manner appropriate to their significance;</li> <li>d) Securing the long-term future and, where appropriate, the optimum viable use of the heritage assets and reducing the number of entries on the Heritage at Risk Register;</li> <li>e) Only accepting proposals that would result in the harm or loss of heritage assets where cumulative impacts have been fully assessed and the requirements of national planning policy and legislation have been clearly satisfied;</li> <li>f) Requiring proposals that may affect heritage assets (and their setting) or assets of archaeological interest to be supported by heritage impact or archaeological assessments to inform decision making with regard to local evidence including the Historic Environment Record (HER);</li> <li>g) Preserving or enhancing conservation areas including key elements, positively identified in any Conservation Area Appraisals and Management Plans;</li> <li>h) Protecting strategic views of heritage assets and their setting where appropriate;</li> <li>i) Supporting innovative and creative architectural design responses where appropriate;</li> <li>j) Supporting the historic environment to appropriately mitigate and adapt to climate change;</li> <li>k) Working with partners organisations including Historic England and community groups to further develop knowledge, evidence and understanding of the city region’s historic environment and assets.</li> </ul>	<p><b>No Likely Significant Effects, screened out.</b></p> <p>This policy is a strategic development management policy that sets out the criteria to support the historic environment and cultural priorities of the City Region.</p> <p>The policy does not provide a quantum of development nor does it pertain to development in particular areas of the City Region.</p>
<p><b>Policy LCR DP15 – Safer Placemaking</b></p>	<p>Development plans and proposals should help to create safe and secure places. This will be achieved by:</p> <ul style="list-style-type: none"> <li>a) Minimising the fear of and opportunities for crime, including the threat of terrorism, through design measures in accordance with Policy DP6;</li> <li>b) Requiring developments that will result in crowded places, to produce a Safer Placemaking Design Statement that satisfies principles and standards that address the issues of crowded places and terrorism including: ensuring that public realm and pedestrian permeability associated with a building or site is not adversely impacted, ensuring that design considers the application of Hostile Vehicle Mitigation measures at an early stage and ensuring early consultation with the Police on risk mitigation measures;</li> </ul>	<p><b>No Likely Significant Effects, screened out.</b></p> <p>This policy is a strategic development management policy that set out the criteria to produce safer places to live.</p> <p>The policy does not provide a quantum of development nor does it pertain to development in particular areas of the City Region.</p>

Policy number/ name	Policy summary and proposed approach (full policy details can be found in the SDS document)	Likely Significant Effects Screening Assessment
	<ul style="list-style-type: none"> <li>c) The provision of well-lit and overlooked routes to address fear of safety and security particularly on routes to and from public transport stops;</li> <li>d) Supporting mixed-use of spaces that broaden the variety of activities available for natural surveillance;</li> <li>e) Ensuring that developments with public spaces and a network of streets are safe, secure, and accessible to all;</li> <li>f) Providing opportunities for social interaction as part of new development including through the provision of new, or integration with existing community facilities and public spaces;</li> <li>g) Requiring major developments (where applicable) to carry out effective and inclusive community engagement, with a particular focus on vulnerable and marginalised groups, to help shape new buildings, streets, and open spaces; and</li> <li>h) Requiring development schemes that could generate safety risks to the wider community, with a particular focus on women, such as transport schemes and public parks to provide a Safer Placemaking Design Statement, outlining how the design and operation of the development will meet the safety requirements of vulnerable and marginalised groups and how they have been involved in the design process.</li> </ul>	
<p><b>LCR DP16 - Delivering Social Value</b></p>	<p>Development plans and proposals should seek to maximise social value provided by new development for its future users and the wider community. Aspects of social value deliverable through planning include:</p> <ul style="list-style-type: none"> <li>• Reducing crime and anti-social behaviour;</li> <li>• Education and skills provision;</li> <li>• Local employment and job creation;</li> <li>• Improving the natural environment and public open space; and</li> <li>• Benefits to health and well-being.</li> </ul> <p>The provision of social value as a result of new development will be achieved by the following measures:</p> <ul style="list-style-type: none"> <li>a) Requiring development proposals defined as of 'potential strategic importance' to be informed and accompanied by a Social Value Statement clearly setting out the measures proposed through the lifecycle of the development or that will make a positive contribution to social value, including Employment and Skills plans, the creation of apprenticeships and training opportunities for local people and the use of local suppliers of goods and services;</li> <li>b) The use of local policy and/or supplementary planning documents setting out the social value priorities for the local authority area and how these should be demonstrated and provided;</li> <li>c) Securing commitments to social value through appropriate mechanisms such as planning conditions Section 106 agreements, Community Infrastructure Levy (CIL) or other potential future tariffs/levies, in accordance with national and local planning policy and relevant legislation.</li> </ul>	<p><b>No Likely Significant Effects, screened out.</b></p> <p>This policy is a strategic development management policy that set out the criteria to produce better, healthier, inclusive, high-quality and distinctive places to live.</p> <p>The policy does not provide a quantum of development nor does it pertain to development in particular areas of the City Region.</p>

Source: Policy details provided by LCRCA

# Appendix D

## D.1 Buffers for European sites within and around Liverpool City Region used in the screening

<b>10km buffer</b>	To identify potential risk of habitat loss around the SPA designated for wintering waterfowl and wader bird assemblages including golden plover and lapwing. The Natural England document 'Impact Risk Zones Guidance Summary Sites of Special Scientific Interest Notified for Birds Version 1.1' (dated March 2019) identifies that for SSSIs designated for wintering waterfowl and waders (golden plover and lapwing) a maximum of 10km is appropriate for the identification of potential functionally-linked land for airports (10km).
<b>8km buffer</b>	To identify potential risk of water pollution/litter applicable to all European sites where water quality is a priority issue currently affecting or threatening the condition of a feature of the site.
<b>7km buffer</b>	<p>To identify potential risk of increased recreational pressures applicable to all European sites where recreational is a priority issue currently affecting or threatening the condition of a feature of the site.</p> <p>Recreational catchments vary from European site to European site but for catchments for inland sites are often in the range of 2-7km while those for coastal sites are often larger. Various research reports have provided compelling links between changes in housing and access levels. The results of studies compiling visitor survey data for a range of European sites<sup>203</sup> demonstrate that more housing consistently means more visitors to protected sites, across most habitats. This is particularly the case for on-foot visitors that originate from housing within 1.5 km, highlighting that additional housing development in close proximity to protected sites is likely to significantly increase recreation pressure. For those sites with car parks, levels of housing within 15 km of protected sites were also a significant predictor of visitor pressure but depended on habitat type.</p> <p>To identify potential risk of invasive species applicable to all European sites where invasive species is priority issue currently affecting or threatening the condition of a feature of the site. It makes sense for this to be similar to that for recreational pressure as recreational visits to a site could be accompanied by fly tipping (for example).</p>
<b>4km buffer</b>	<p>To identify potential risk of habitat loss around the SPA designated for wintering waterfowl and wader bird assemblages not including golden plover.</p> <p>The Natural England document 'Impact Risk Zones Guidance Summary Sites of Special Scientific Interest Notified for Birds Version 1.1' (dated March 2019) identifies that for SSSIs designated for wintering waterfowl and waders other than golden plover and lapwing) a maximum of 2km is appropriate for the identification of potential functionally-linked land for development with the exception of wind energy (3km) and airports (10km).</p>
<b>1km buffer</b>	To identify potential risk of urban effects i.e., fire/arson or fly tipping applicable to all European sites where urban effects are priority issues currently affecting or threatening the condition of a feature of the site.

<sup>203</sup> Weitowitz D.C., Panter C., Hoskin R. & Liley D. 2019. The effect of urban development on visitor numbers to nearby protected nature conservation sites. *Journal of Urban Ecology* 5. <https://doi.org/10.1093/jue/juz019>

Research has shown that urban effects including arson and damage/disturbance are more likely to occur where developments occur within 500m of a European Site<sup>204</sup> although they do occasionally occur at greater distances. A 1km buffer zone is considered precautionary for the purposes of screening.

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**500m buffer**

A 500m zone is also used on a precautionary basis to identify Broad Locations for Growth where the greatest risk of disturbance during construction of development (or operation of non-residential development). Studies indicate that noise levels in excess of 84 dB(A) typically elicit a flight response in birds<sup>205</sup> and the same research recommends that construction noise levels are kept below 70 dB to avoid excessive disturbance of birds<sup>206</sup>. The noisiest construction activity is generally impact piling, where a hammer is dropped on the pile. This has a typical maximum noise level of 100-110dB at 1m from source. Noise attenuates by 6dB for every doubling of distance, such that impact piling typically results in noise levels below 70 dB at distances of more than 100m from source. Therefore, a 500m separation between construction activity and the SPA/Ramsar is very unlikely to result in any disturbance.

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**200m buffer**

To identify potential risk of localised (rather than dispersed) effects on air quality applicable to all European sites where air quality is a priority issue currently affecting or threatening the condition of a feature of the site. The 200m zone is well evidenced, based on monitoring data, is in line with the standard approach in Design Manual for Roads and Bridges and will certainly cover the zone along each relevant road where traffic pollution will be most elevated.

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<sup>204</sup> Kirby, J. S. & Tantram, D.A.S. (1999) 'Monitoring heathland fires in Dorset: Phase 1' Report to Department of the Environment, Transport and the Regions: Wildlife and Countryside Directorate

19 Rylatt, F. Garside, L. Robin, S (2017) Human Impacts on Nature Reserves – The Influence of Nearby Settlements. In Practice Issue 97.

<sup>205</sup> Cutts N & Allan J. 1999. Avifaunal Disturbance Assessment. Flood Defence Works: Saltend. Report to Environment Agency).

<sup>206</sup> Cutts, N., Phelps, A. and Burdon, D. (2009) Construction and waterfowl: Defining Sensitivity, Response, Impacts and Guidance. Report to Humber INCA, Institute of Estuarine and Coastal Studies, University of Hull



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