THE LONDON RESORT

The London Resort Development Consent Order

BC080001

Environmental Statement
Volume 2: Appendices

Appendix 12.5 Consultation responses to the 2020 EIA Scoping request

Document reference: 6.2.12.5
Revision: 00

December 2020

Planning Act 2008
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009
Regulation 5(2)(a)
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017
Regulation 12(1)

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Consultee	Topic	Paragraph	Scoping Comments	Response/Action Taken
Natural England - Sean Hanna (Senior Advisor, Sussex and Kent team)	Internationally and nationally designated sites	2.6	The environmental statement should thoroughly assess the potential for the proposal to affect designated sites. European sites (e.g. designated Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)) fall within the scope of the Conservation of Habitats and Species Regulations 2017 (as amended). In addition paragraph 176 of the National Planning Policy Framework requires that potential Special Protection Areas, possible Special Areas of Conservation, listed or proposed Ramsar sites, and any site identified as being necessary to compensate for adverse impacts on classified, potential or possible SPAs, SACs and Ramsar sites be treated in the same way as classified sites.	A thorough assessment of the potential effects upon designated sites is provided within Chapter 12: *Terrestrial and Freshwater Ecology and Biodiversity* (Document Reference 6.1.12) of the Environmental Statement. The assessment has been prepared having had regard to the comments made by Natural England (and other consultees) within the EIA Scoping Opinion, and the Preliminary Environmental Information Report consultation.
		2.7	Under Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended) an appropriate assessment needs to be undertaken in respect of any plan or project which is (a) likely to have a significant effect on a European site (either alone or in combination with other plans or projects) and (b) not directly connected with or necessary to the management of the site.	A Shadow Habitat Regulations Assessment (Document Reference 6.2.12.4) has been submitted along with the application for development consent, to inform the completion of an appropriate assessment by the competent authority (in this case the Secretary of State).
		2.8	Should a likely significant effect to European/internationally designated site(s) be identified or be uncertain, the competent authority may need to prepare an Appropriate Assessment, in addition to consideration of impacts through the EIA process.	
	Sites of Special Scientific Interest (SSSIs) and sites of European or international importance (Special Areas of Conservation, Special Protection Areas and Ramsar Sites)	2.9	Based upon the information provided, the proposal has the potential to directly or indirectly impact the following statutory designated sites: - Bakers Hole Site of Special Scientific Interest (SSSI) . - Darenth Woods SSSI. - Medway Estuary and Marshes SSSI, SPA and Ramsar Site. - Inner Thames Marshes SSSI. - Mucking Flats and Marshes SSSI. - South Thames Estuary and Marshes SSSI. - Thames Estuary and Marshes Special Protection Area and Ramsar Site. - Swanscombe Skull Site SSSI. - Swanscombe Marine Conservation Zone. - West Thurrock Lagoon and Marshes SSSI. - Wouldham to Detling Escarpment SSSI. - North Downs Woodland Special Area of Conservation.	The Environmental Statement includes an assessment of potential impacts on all those designated sites identified by Natural England. To clarify, potential impacts upon the Swanscombe Marine Conservation Zone are provided within Chapter 13: Marine Ecology and Biodiversity (Document Reference 6.1.13). Impacts upon geological sites including Baker's Hole SSSI are assessed within Chapter 14: *Cultural Heritage and archaeology* (Document Reference 6.1.14). The remaining ecology designations referred to by Natural England are assessed within Chapter 12: *Terrestrial and Freshwater Ecology and Biodiversity* (Document Reference 6.1.12)

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		2.10	Further information on the SSSIs, the Marine Conservation Zone and their special interest features can be found at www.magic.gov.uk. The Environmental Statement should include a full assessment of the direct and indirect effects of the development on the features of special interest within these sites and should identify such mitigation measures as may be required in order to avoid, minimise or reduce any adverse significant effects. We would also recommend that the European site conservation objectives5 are utilised when considering the potential impacts to the designated sites.	Potential impacts upon the Swanscombe Marine Conservation Zone are provided within Chapter 13: Marine Ecology and Biodiversity (Document Reference 6.1.13).
		2.11	In addition to the site specific comments, the environmental statement should include the following information: - Details of the potential direct and indirect impacts to designated sites from the proposal. These could result from, for example, direct land take, loss or alteration of habitats from increased boat movements, impacts to functionally linked land for the SPAs and Ramsar Sites, air quality impacts (from dust, traffic and from the proposed combined heat and power plant and gas heating system), water quality, noise, lighting, visual and recreational disturbance and impacts to species associated with the designated sites). - Comprehensive details of how the project has been designed to avoid and fully mitigate all direct and indirect impacts to the designated sites and, in the case of the SPAs and Ramsar Sites, functionally linked land. - Where impacts cannot be fully avoided or mitigated, full details of the compensation measures that are proposed.	The information requested is provided within Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement, and its associated appendices.
		2.12	Natural England would be pleased to provide more detailed advice to the applicant on the scope and methodology for the specific surveys required in relation to all of the designated sites where impacts may occur.	Full details of the survey methodologies undertaken to inform the DCO application were sent to Natural England via email 29 May 2020 (invertebrates only), within the 2020 EIA Scoping request and 2020 PEIR. The surveys are considered robust and sufficient to inform the Environmental Statement.
		2.12	Section 11.2 of the Scoping Report highlights that the applicant will engage with Natural England on the scope of surveys and the recommended mitigation and we look forward to engaging in these discussions. However, with the timeframe for submission of the application being late 2020, we would urge the applicant to engage further with Natural England and other consultees as soon as possible to ensure that the studies are sufficiently robust to inform the environmental statement.	As above, full details of the survey methodologies undertaken to inform the DCO application were sent to Natural England (NE) via email 29 May 2020 (invertebrates only), within the 2020 EIA Scoping request and 2020 PEIR. A briefing note was submitted to NE on 21 August 2020 providing further justification for the scope of bird surveys undertaken (Report reference: edp5988_r022 "Ecology Briefing Note - Natural England Consultation' - a copy of which is enclosed at the rear of this appendix). The Ecology Briefing Note was reissued to NE on 03 December 2020, asking for their review of the document and confirmation whether any further surveys are required. NE have provided no further comments. The surveys are considered robust and sufficient to inform the Environmental Statement.

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	Designated Sites - Darenth Woods SSSI	2.16	Parts of the Darenth Woods SSSI, which is a nationally important ancient woodland, fall within the development consent order boundary where junction improvements to the A2 corridor are proposed. It is unclear from the information provided whether any direct land take is proposed from within the SSSI. Ancient woodland is an irreplaceable habitat and Paragraph 175 of the NPPF, in addition to the policy wording relating to SSSIs (see Section 2.14 of this letter) states that 'development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons'. Section 5.32 of the National Policy Statement for National Networks provides similar protection for irreplaceable habitats.	The Proposed Development will result in no direct land take from within the SSSI. Whilst the DCO boundary previously included the ancient woodland parcels between the A2 and A296 slip roads, these have since been removed and will not be affected by The London Resort proposals, which will be limited to minor highway works in this area such as road markings and signage. As a point of clarity, a small number of individual trees will be lost on the edge of 'The Thrift' Ancient Woodland on the southern boundary of the A2 and the slip road as a result of the separate A2 Bean and Ebbsfleet Junction improvement works which was permitted in May of this year.
		2.16	In addition to the concern regarding direct loss of the SSSI, there is the potential for air quality impacts to the woodland to result from this proposal both during construction and operation from traffic-generated air quality impacts. We would therefore recommend that the environmental statement includes a thorough assessment of the potential direct and indirect impacts to the SSSI.	The Environmental Statement includes a thorough assessment of the potential for traffic-generated air quality impacts to Darenth Woods SSSI both during construction and operation. This is presented within Chapter 12: Ecology and Freshwater Ecology and Biodiversity (Document Reference 6.1.12), using data on potential air quality impacts derived from Chapter 16: Air Quality (Document Reference 6.1.16).
	Mucking Flats and Marshes SSSI, South Thames Estuary and Marshes SSSI, Thames Estuary and Marshes SPA and Ramsar Site, Medway Estuary and Marshes SSSI, SPA and Ramsar Site, Inner Thames Marshes SSSI, West Thurrock Lagoon and Marshes SSSI	2.17	The Mucking Flats and Marshes and the South Thames Estuary and Marshes SSSI form the constituent SSSIs to the Thames Estuary and Marshes SPA and Ramsar Site. The appendices to the Scoping Report include the bird surveys undertaken for the Swanscombe Peninsula; these state that the land subject to this proposal is 'functionally linked' to the Special Protection Areas and Ramsar Sites although it is not confirmed whether the linkage is to the Thames Estuary and Marshes or the Medway Estuary and Marshes, or indeed both. Functionally linked land is habitat outside of the designated site boundaries which supports mobile species associated with the designated sites and should be considered within the impact assessment and Habitats Regulations Assessment. Further guidance on functionally linked land can be found within Natural England's Report NECR207 '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	It is not possible to confirm with absolute certainty the degree of linkage to each individual statutory designated site in the potential zone of influence of the Project Site (including the Thames Estuary and Marshes Ramsar/ SPA/ SSSI and the Medway Estuary and Marshes Ramsar/ SPA/ SSSI) due to their proximity to each other and the large amount of overlap in the bird species assemblages noted in their respective citations. However, it is reasonably considered that there is likely to be an element of functional linkage to all of the nearby sites designated for bird interest, decreasing in proportion to their distance from the Project Site. A full assessment of the loss of, and disturbance to, functionally linked land is included within Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement and Appendix 12.4: Shadow Habitat Regulations Assessment (Document Reference 6.2.12.4). The assessment has been prepared with reference to the Natural England Research Report NECR207 as referred to by Natural England.

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		2.17	To inform the environmental statement, detailed survey information will be required and a minimum of two seasons of recent bird survey data is normally required to provide a robust baseline for the environmental assessment. From the information provided, it appears that only a single recent winter survey period (winter 2019/20) is proposed to be submitted. In addition to the winter bird surveys, breeding birds are notified features of some of the coastal SSSIs. The Thames is also a key passage corridor for wintering birds so the environmental statement should include detailed survey information along with a robust impact assessment for birds during the breeding and over-wintering periods along with birds on passage	A briefing note was submitted to Natural England (NE) on 21 August 2020 providing further justification for the scope of bird surveys undertaken (Report reference: edp5988_r022 "Ecology Briefing Note - Natural England Consultation', a copy of which is enclosed at the rear of this appendix). The Ecology Briefing Note was reissued to NE on 03 December 2020, asking for their review of the document and confirmation whether any further surveys are required. NE have provided no further comments. The briefing note included the following statement in respect of bird survey data: "The Environmental Statement and Habitats Regulations Assessment (HRA) to be submitted along with the Development Consent Order (DCO) application will be informed by a comprehensive suite of wintering, passage and breeding bird survey data collated during winter 2019/2020 through to spring 2020. In addition, this recent data is supplemented by a suite of 'baseline' surveys completed by Chris Blandford Associates (CBA) during 2012/2013. Therefore, two seasons of bird survey data is to be submitted along with the DCO application, albeit not in consecutive years. The wetland habitats within the Kent Project Site have not changed significantly in the intervening years between the 2012/2013 baseline surveys and the recent 2019/2020 surveys, and the data collected is more or less consistent across that time period. As set out in the Preliminary Environmental Information Report (PEIR) the wintering wader/wildfowl assemblage using the Kent Project Site has been valued at the International level owing to its association with the nearby Ramsar and SPAs. The assemblage, which is treated as an Important Ecological Feature (IEF) in the Ecological Impact Assessment, has therefore been valued at the highest level, and data from additional surveys will not affect this valuation or significantly alter the impact assessment and mitigation measures being developed."
				To further assess the ornithological interest at the Project Site a comprehensive desk study, based on Wetland Bird Survey (WeBS) data and local record centre data, has been updated in 2020. Gaps in the WeBS data have been acknowledged and covered through the inclusion of survey data accumulated during the Tilbury2 DCO application.

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		2.17	In addition to the potential for direct impacts from the proposal through loss of habitat used by birds associated with the designated sites , there is also the potential for significant indirect impacts. Such indirect impacts may, for example, result from: Water quality and water availability to the reedbed and marsh habitats on the Swanscombe Peninsula during construction and operation; Noise and visual disturbance to birds during construction and operation of the Resort (both on the Swanscombe Peninsula and within the designated sites and wider Thames Estuary from the passenger ferries and delivery of construction materials); Impacts from lighting to birds, both on the Peninsula and at the ferry terminals; Impacts to sediment (and food availability) in the Thames from the construction/upgrade/refurbishment of the jetties/passenger ferry terminals and any maintenance dredging during construction and operation; Impacts to habitat (including sediment and prey availability) from the wash associated with an increase in boat movements within the Thames Estuary from the construction and operation of the Resort.	The Environmental Statement includes a full assessment of the potential for significant indirect impacts upon the habitats within the DCO boundary used by birds associated with designated sites, and the potential for likely significant effects is explored and evidenced within Appendix 12.4: Shadow Habitat Regulations Assessment (Document Reference 6.2.12.4). Natural England's comments in this regard are noted.
		2.17	Given the confirmed functional linkage to the SPA(s) and Ramsar Site(s) and, as detailed above, the potential for direct and impacts to habitats and species, the applicant will need to prepare a Habitats Regulations Assessment to be submitted with the application. This should be in accordance with the guidance contained within the Planning Inspectorate's 'Advice note ten: Habitats Regulations Assessment relevant to nationally significant infrastructure projects'8 and all relevant case law.	A Shadow Habitat Regulations Assessment (Document Reference 6.2.12.4), prepared in accordance with the guidance stated, is submitted alongside the DCO application.
	Wouldham to Detling Escarpment SSSI and the North Downs Woodland Special Area of Conservation (SAC)	2.19	There is the potential for air quality impacts to the North Downs Woodland SAC to result from traffic generated air quality. As such, Natural England recommends that an assessment of the potential for air quality impacts from this project, both alone and in-combination with other plans or projects, is provided within the environmental statement.	The potential for traffic-generated air quality impacts on the North Downs Woodland SAC has been screened as part of the Habitat Regulations Assessment (Document Reference 6.2.12.4). Air quality impacts upon the SAC are also assessed within Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement, using information derived from Chapter 16: Air Quality (Document Reference 6.1.16) of the ES.
	Regionally and Locally Important Sites	3.2	The environmental statement should include a full assessment of the likely impacts on the wildlife and geodiversity interests of such sites. The assessment should include proposals for mitigation of any impacts and if appropriate, compensation measures. Detailed surveys for all of the interest features of the Local Wildlife Sites should inform the impact assessment.	Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement includes an assessment of the likely impacts on the wildlife interests of Local Wildlife Sites. Details of the proposed mitigation measures are also provided. A comprehensive suite of ecology surveys has been undertaken across the Project Site to information the Environmental Statement, and the scope of surveys is considered robust and sufficient to inform the Environmental Statement.

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		3.3, 3.4	The Scoping report recommends that only the following Local Wildlife Sites will be considered within the environmental statement: - Alkerden Lane Pit - Botany Marshes - Ebbsfleet Marshes, Northfleet - Tilbury Marshes	Full justification for scoping out any local sites from inclusion in the Environmental Statement is provided in Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement. In addition to the sites referred to by NE, the potential for air quality impacts upon the Disused Hospital Grounds, Mabledon LWS is also assessed within Chapter 12.
			A number of other Local Sites within close proximity to both the Kent and Essex sites have been scoped out for consideration within the environmental statement. However, no ecological justification appears to have been provided to explain why these sites should not be considered within the environmental statement. Natural England therefore recommends that further clarity on why these sites have been excluded for further consideration should be provided. Where impacts are possible, a comprehensive impact assessment should be included within the environmental statement.	
	Protected Species - Species protected by the Wildlife and Countryside Act 1981 (as amended) and by the Conservation of Habitats and Species Regulations 2017 (as amended)	4.1	The environmental statement should assess the impact of all phases of the proposal on terrestrial, freshwater and marine protected species (including, for example, dormice, great crested newts, reptiles, birds, water voles, badgers and bats).	A comprehensive suite of ecology surveys has been undertaken across the Project Site to information the Environmental Statement, and the scope of surveys is considered robust and sufficient to inform the Environmental Statement.
		4.2	The area likely to be affected by the proposal should be thoroughly surveyed by competent ecologists at appropriate times of year for relevant species and the survey results, impact assessments and appropriate accompanying mitigation strategies included as part of the environmental statement. In order to provide this information there may be a requirement for a survey at a particular time of year. Surveys should always be carried out in optimal survey time periods and to current guidance by suitably qualified and where necessary, licensed, consultants. Natural England has adopted standing advice9 for protected species which includes links to guidance on survey and mitigation.	Ecological surveys have been completed by competent Ecologists at appropriate times of the year, with reference to best practice guidelines where available. Full details of the surveys undertaken, including their methodology, timing and any survey limitations, have been reported fully in Appendix 12.1: Ecology Baseline Report (Document Reference 6.2.12.1).

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		4.3	The supporting appendices to the Scoping Report highlight that a number of protected species have been recorded across the Kent Site during the previous surveys. Natural England would expect all of the species surveys for the Kent Site to be updated in 2020. In addition, surveys for the Essex Site should also be undertaken to ensure that a robust baseline is available for the impact assessment on both sides of the Thames.	Natural England's comments are noted. A comprehensive suite of ecology surveys has been undertaken across the Project Site to information the Environmental Statement. A much smaller range of ecological surveys was undertaken at the Essex Project Site, including a Phase 1 Habitat survey, eDNA survey of ditches for great crested newts, building assessments for roosting bats, and invertebrate habitat assessment. This is due to the nature of the habitats in the Essex Project Site being almost entirely developed land. The applicant would welcome confirmation if Natural England feels any additional surveys are required, otherwise the scope of surveys is considered robust and sufficient to inform the Environmental Statement
		4.4	It will be important for the environmental statement to include recent survey information. Natural England would be pleased to advise the applicant on the scope and methodology for the specific surveys required in relation to protected species. Section 11.2 of the Scoping Report highlights that the applicant will seek our advice on the scope of surveys and the recommended mitigation and we look forward to engaging in these discussions.	The scope of surveys, as described in Appendix 12.1: Ecology Baseline Report (Document Reference 6.2.12.1), is considered robust and sufficient to inform the Environmental Statement. A meeting was held on the 10 August 2020, and a follow up meeting scheduled for 24 August 2020.
	Habitats of principal importance	5.3	Natural England advises that a habitat survey (equivalent to Phase 2) is carried out on the site, in order to identify any important habitats present. In addition, surveys for priority species including ornithological, botanical and invertebrate surveys should be carried out at appropriate times in the year, to establish whether any scarce or priority species are present.	Noted. These surveys have been completed and used to inform the Environmental Statement
		5.5	In addition, the botanical survey undertaken in 201211, included within the appendices to the Scoping Report, highlights that some of the grassland areas within the Kent Site demonstrated affinities to species rich neutral (MG5) grassland.	An update botanical survey has been completed in summer 2020, the findings are provided in full within Appendix 12.1: Ecology Baseline Report (Document Reference 6.2.12.1).
		5.8	Given that much of the land within the development consent order boundary is included within the national Priority Habitat Inventory, Natural England would expect the environmental statement to fully detail how the proposal has been designed to avoid and fully mitigate the impacts to all of the priority habitats resulting from this proposal.	Full details of avoidance, mitigation and, where necessary, compensation measures are provided within Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement.
	Species of principal importance	5.12	It is important that the environmental statement considers the potential impacts of the proposal to all species of conservation concern. Based upon the information provided to date, Natural England is particularly concerned about the potential impacts to birds, invertebrates and plants.	Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement considers the potential impacts on all species of conservation concern, including birds, invertebrates and plants as identified by Natural England.

Consultee	Topic	Paragraph	Scoping Comments	Response/Action Taken
	Birds	5.14	Natural England is keen to work with the applicant to understand the importance of the habitats within the application boundary for birds, both in relation to the designated site and species of wider conservation concern. From the information provided to date, the Kent Site appears to be of significant conservation value and we would therefore recommend the Resort is designed in a way which avoids direct impacts to the areas of conservation value and we will be pleased to work with the applicant in this regard.	The applicant has consulted with Natural England via the EIA Scoping request, PEIR consultation and meetings held on 10 August 2020, 24 August 2020, and 01 October 2020. The potential impacts on birds have been considered within Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement, and Appendix 12.4: Habitat Regulations Assessment (Document Reference 6.2.12.4). Furthermore, a draft 'Breeding Bird and Wintering Bird Mitigation Strategy' (the final version of which is enclosed within Appendix 12.3: Ecological Mitigation and Management Framework, Document Reference 6.2.12.3) was submitted to Natural England on 05 October 2020 to invite their comments on the proposed mitigation strategy ahead of the DCO application being made. At the time of writing, no response from Natural England has been received on the document.
				To minimise impacts on birds, the proposed layout retains Black Duck Marsh which has been identified as an important area for wintering birds and breeding birds. Furthermore, large areas of the existing saltmarsh habitat is retained, with significant areas of new saltmarsh creation to be provided to create new inter-tidal habitats of value to birds.
	Invertebrates	5.15	The Thames Estuary is considered to be a very important area for invertebrate species. From the London Resort's own studies and those undertaken for other development proposals, the invertebrate assemblages across the Kent Site, and those within the local wildlife sites and habitat surrounding the Essex Site, appear to be of particularly high nature conservation value. We would therefore recommend the Resort is designed in a way which avoids direct impacts to the areas of conservation value and Natural England would welcome the opportunity to work with the applicant in this regard.	The applicant has consulted with Natural England and the potential impacts on invertebrates have been considered within Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the ES. A draft 'Invertebrate Mitigation Strategy' (the final version of which is enclosed within Appendix 12.3: Ecological Mitigation and Management Framework, Document Reference 6.2.12.3) was submitted to Natural England on 22 September 2020 to invite their comments on the proposed mitigation strategy ahead of the DCO application being made. At the time of writing, no response from Natural England has been received on the document.
		5.15	We are keen to work with the applicant to ensure that the value of the Kent and Essex sites for their invertebrate assemblage is fully understood. Natural England expects a robust assessment of the impacts to be provided as part of the environmental statement for invertebrates based upon comprehensive survey information across the entire survey season for the Kent and Essex Sites. Where impacts cannot be avoided, a comprehensive mitigation, compensation and enhancement package should be included within the environmental statement.	
	Plants	5.16	The botanical survey undertaken for the Kent Site in 2012 recorded five nationally scarce plants across the site (yellow vetchling, Bithynian vetch, man orchid, divided sedge and golden samphire). In addition, there are historical records for 52 notable vascular plant, lichen and fungi within a two kilometre radius of the application site.	The updated botanical survey undertaken in 2020 has reconfirmed the presence of each of these nationally scarce plants on the Kent Project Site, with the exception of man orchid which could not be relocated despite sustained survey effort. A 'Rare Plant Mitigation Strategy' is provided within Appendix 12.3: Ecological Mitigation and Management Framework, Document Reference 6.2.12.3), which provides mitigation measures such as translocation of plants/turfs to ensure that the site continues to maintain populations of rare plants.

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		5.16	Given the nature of the habitats within the application boundary, Natural England would recommend that comprehensive upated surveys are undertaken to inform a robust impact assessment.	A detailed up to date botanical survey has been undertaken in 2020, full details of which are provided in Appendix 12.1: Ecology Baseline Report (Document Reference 6.2.12.1. The survey findings, as well as those from other ecological surveys, have informed a robust impact assessment, as well as the development of an appropriate mitigation strategy, as presented in Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the ES.
	Air quality	9.1	The assessment should take account of the risks of air pollution and how these can be managed or reduced.	Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement, and Appendix 12.4: Habitat Regulations Assessment (Document Reference 6.2.12.4), has considered the potential effects of air quality on ecological receptors.
		9.1	Further information on air pollution impacts and the sensitivity of different habitats/designated sites can be found on the Air Pollution Information System (www.apis.ac.uk). Further information on air pollution modelling and assessment can be found on the Environment Agency website	The guidance stated has been used to inform the air quality assessment referred to above.
	Climate change adaptation	10.10	The England Biodiversity Strategy published by Defra establishes principles for the consideration of biodiversity and the effects of climate change. The environmental statement should reflect these principles and identify how the development's effects on the natural environment will be influenced by climate change, and how ecological networks will be maintained. The NPPF requires that the planning system should contribute to the enhancement of the natural environment 'by establishing coherent ecological networks that are more resilient to current and future pressures' (NPPF Para 174), which should be demonstrated through the environmental statement.	Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement, considers the influence of climate change upon ecological receptors, using information derived from Chapter 20: Greenhouse gases and climate change (Document Reference 6.1.20).
	Cumulative and in-combination effects	11.1	A full consideration of the implications of the whole scheme should be included in the environmental statement. All supporting infrastructure should be included within the assessment.	Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement provides full consideration of the cumulative impact of the Proposed Development upon ecological receptors.
	Environmental enhancement and mitigation measures	12.1	In addition to the required mitigation and compensatory measures for impacts to biodiversity and geodiversity assets from the London Resort, Natural England recommends that the scheme should deliver a net benefit for biodiversity and the wider environment. Such enhancements should consider the terrestrial, aquatic and marine habitats and species. The environmental statement should fully detail the environmental enhancements that will be provided by the applicant.	Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement provides a comprehensive package of mitigation measures for terrestrial and freshwater species/ species assemblage recorded within the Project Site. A suite of on-site habitat creation and enhancement measures of benefit to terrestrial, aquatic and marine habitats and species is provided, and illustrated within Appendix 11.7: Landscape Strategy (Document Reference 6.2.11.7). Details pursuant to the delivery of appropriate off-site mitigation are provided within Appendix 12.10 'General Principles for Offsite Ecological Mitigation' (Document Reference 6.2.12.10). Collectively, through adherence to these measures, the Proposed Development is capable of providing a net gain for biodiversity.
		12.2	Natural England recommends that positive environmental outcomes should be delivered from major infrastructure developments. Nationally Significant Infrastructure Projects can make a significant contribution to delivering the environmental ambition in the Government's 25 Year Environment Plan14. This aims to deliver an environmental net gain through development and infrastructure.	

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		12.4	As part of an overall enhancement package, Natural England recommends that options for reconnecting habitats through the creation of new semi-natural habitat, linking in with local priorities this part of the Thames estuary. Similarly, we would encourage the applicant to work closely with other major projects on both sides of the Thames to deliver a coherent, landscape scale mitigation and enhancement strategy.	As documented within Appendix 12.10 'General Principles for Offsite Ecological Mitigation' (Document Reference 6.2.12.10), off-site mitigation for the loss of functionally linked wetland habitat will be delivered within the Greater Thames Nature Improvement Area in order to provide new habitats in coherence with existing conservation objectives in the local area.
		12.5	Where habitat compensation will be required for any of the habitats or species impacted by the development, the long-term security and management of the site(s) needs to be secured and we recommend that the mechanism for this should be detailed within the environmental statement.	Natural England's comments are noted and this information is included within Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement. At the time of making the application for development consent, off-site mitigation has not yet been secured, however a set of general guiding principles has been provided, to be adhered to in the delivery of off-site ecological mitigation, see Appendix 12.10 'General Principles for Offsite Ecological Mitigation' (Document Reference 6.2.12.10). The need to provide long term management and monitoring of off-site mitigation land has been identified as a requirement within the principles document referred to above.
The Environment Agency - Karolina Allu (Planning Specialist)	Water Quality	11.44	We have provided advice on the spread of water quality sampling points to ensure the whole site is fully understood; in particular those parts of the site subject to most significant change or redevelopment as part of this proposal.	WQ monitoring surface water quality sampling has been undertaken for the project. Two of the proposed sample locations are within the Ebbsfleet. The EA have been consulted on the location of the water sampling points. In addition, sampling of the aquatic invertebrate community has been undertaken at circa 30 locations across Black Duck, Botany and Swanscombe marshes from which biotic indices have been derived to provide an indication of biological water quality and value for an invertebrate assemblage.
		11.44	It is important to consider the wider Ebbsfleet Garden City development and take consideration of water quality impact across the larger site. Impacts and mitigation for the cumulative effect of nearby developments need to be taken into account.	Representative samples of waterbodies across the Kent Project Site have been undertaken to inform an assessment of potential effects upon water quality. Survey work has included the assessment of an aquatic invertebrate community within standing waterbodies across Black Duck, Botany and Swanscombe marshes and subsequent calculation of biotic indices to provide an indication of biological water quality. The results of survey effort and aquatic invertebrate taxa lists are provided within Annex 11 to the 'Ecology Baseline Report (Document Reference 6.2.12.1).
		11.46	It is proposed that water quality within the River Ebbsfleet will be assessed using aquatic invertebrate surveys only. Despite the lack of WFD classification here we would like to see a water quality survey using typical physical-chemical indicators to provide a baseline before the work starts and to allow the project to demonstrate that there has been no adverse impact on water quality. The invertebrate surveys are a good step, however not a true indicator of chemical water quality elements. EW sampling should be included as well as invert surveys.	WQ monitoring surface water quality sampling has been undertaken for the project and will be continued during construction and for an agreed period post-construction. Two of the proposed sample locations are within the Ebbsfleet. The EA have been consulted on the location of the water sampling points.

Consultee	Topic	Paragraph	Scoping Comments	Response/Action Taken
		11.46	We recommend the developer to collects water quality samples pre-, during, and postdevelopment so we can assess potential impacts on the River Ebbsfleet as well as the other sample sites raised in the WFD scoping report. The River Ebbsfleet has real potential, being groundwater fed from the underlying chalk, and the habitat is poor in the main channel and it's hidden away/culverted in sections. Improvements to this river could be a good opportunity for mitigating impacts for other areas of the development in terms of zero net loss of diversity & habitat.	WQ monitoring surface water quality sampling have been undertaken for the project and will be continued during construction and for an agreed period post-construction. Two of the proposed sample locations are within the Ebbsfleet. The EA have been consulted on the location of the water sampling points. This is in addition to assessment of the aquatic invertebrate community at 4 locations along the River Ebbsfleet, establishing a biological baseline against which the results of future monitoring can be prepared, whilst sampling or an aquatic invertebrate community across standing waterbodies as also been completed. The results of this are presented at Annex 11 to the 'Ecology Baseline Report (Document Reference 6.2.12.1).
	Fish surveys	11.46	Fish surveys should also still be carried out. If the project is proposing any kind of mitigation in the River Ebbsfleet, fish surveys will be helpful in demonstrating the impact and benefit of their mitigation measures.	Further information regarding a scoping assessment for freshwater fish populations associated with the River Ebbsfleet, was provided to Environment Agency for further comments and consultation in the form of an Ecology Briefing Note (report reference: edp5988_r019, a copy of which is enclosed at the rear of this appendix). With reference to this document, no fish surveys of the River Ebbsfleet was proposed given the presence of significant barriers to fish movement, combined with the modified nature and heterogeneity of habitat features. A formal response was received from the EA on 15 September 2020 (reference: KT/2020/127432/01-L01) confirming they were in agreement with EDP's assessment of the River Ebbsfleet and associated fish communities and confirmed they did not consider further survey effort necessary. With respect to the River Ebbsfleet, mitigation will be limited to habitat creation and enhancement of habitats within the floodplain adjacent and associated with proposed drainage features. No habitat measures are proposed to the River Ebbsfleet itself given its engineered nature and role in flood defence. We would consider there to be no value in sampling a fish community to assess impacts and benefits of mitigation measures given that an assemblage is constrained by the presence of significant culverts preventing movement between the River Thames and Ebbsfleet as well as the relative homogeneity of the watercourse.
	Habitats	11.51	It is unclear why this scoping study has picked out specific habitats and flora to be included in the Environmental Statement. The overall mosaic of habitats, including brownfield habitats associated with the whole site must be included. We expect to see detailed information on how much habitat is currently represented on the development site, and an understanding of how this mosaic of habitats and species interact and utilise the site. Therefore no one habitat should be excluded from the assessment.	Habitats of higher intrinsic value (significant at the local level or higher) have been identified to be assessed as Important Ecological Features, in accordance with industry guidelines for Ecological Impact Assessment. Habitats of lesser value have been assessed and quantified through the biodiversity net gain calculations using the DEFRA Metric 2.0. Habitats of lesser value that support protected or notable species have also been assessed for their value to those species within the ES. The overall mosaic of habitats, which includes large areas of 'Open Mosaic Habitats on Previously Developed Land' (Priority habitat), has been included within the ES.
		11.51	The mosaic of habitats found at the site has previously been highlighted by the London Resort as an important aspect of the ecology. Any species of local, regional or nationally scarce, rare or of particular interest should be included, particularly invertebrate species. Habitats of site value that nonetheless form part of the mosaic of habitats used by species or assemblages of greater than site value, should also be taken into account, if they form part of the range of habitats that they utilise on site.	Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the ES includes the mosaic habitat 'Open Mosaic Habitat of Previously Developed Land' as an Important Ecological Features, and therefore impacts upon habitats that lie within it (even those of site level value on their own) are assessed, and mitigated where necessary.

Consultee	Topic	Paragraph	Scoping Comments	Response/Action Taken
	The Tilbury Site	11.60	The project should address the following points in reviewing the Tilbury site: - Impacts on designated sites (SSSIs) within 2km. These are incredibly sensitive, particularly West Thurrock Lagoons and Marshes SSSI, where restoration management has been undertaken in recent years by developers and Natural England. - Impacts on Local Wildlife Sites within 2km. - Protected species such as water voles and great crested newts. - Rare invertebrate species i.e. brownfield assemblages. - SuDS should incorporate wildlife features and compensation should aim for a ratio greater than 1:1. - The installation of new culverts is generally to be avoided wherever possible and compensation undertaken if this is unavoidable.	The Environment Agency's comments have been noted. Impacts upon terrestrial habitats will be limited at the Essex Project Site, but nonetheless have been assessed within Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the ES. Impacts on statutory and non statutory designations within 2km of the Essex Project Site have been assessed, and sites beyond 2km included where there is potential for air quality impacts due to the site's proximity to the affected road network.
	Pond surveys - great crested newts	11.62	The ponds most likely to hold Great Crested Newts, based on the water quality surveys, have not been included for the GCN assessment (Central CTRL Wetlands). It is not clear why they have been excluded from assessment.	Some of the ponds within Swanscombe Peninsula, particularly those around the CTRL Wetland were not safely accessible in order to undertake GCN surveys. This was due to high water levels until mid-summer and the presence of a large number of Schedule 1 nesting bird species within wetland habitats, which cannot legally be disturbed.
	Water vole surveys	11.65	It isn't clear from the submitted information if the updated water vole surveys will be sufficiently thorough. Whilst deploying rafts can help identify the presence of watervoles the surveys will need to involve much more thorough searches. How the surveys will be conducted in the areas of dense reedbed of the central wetlands needs to be clarified, as we need to sufficiently understand how this habitat will be properly assessed for this species and many others. It is also unclear how the areas of wetland, particularly areas of reedbed will be fully assessed utilising a methodology of	The Environment Agency's comments have been noted. Many of the wetland habitats, including ditches and reedbeds, were heavily choked with dense vegetation and not accessible for the purposes of a traditional water vole survey. The methodology used is a recognised technique following guidance set out in the Water Vole Mitigation Guidelines and was necessary due to the presence of dense reeds, which significantly limit visibility. Furthermore, the reedbed and other wetland habitats on-site support nesting Schedule 1 bird species (bearded tit, Cetti's warbler, marsh harrier), meaning that access to those habitats was not possible without contravention of the Wildlife & Countryside Act (1981). Where access was not possible and evidence of water vole presence is found nearby, presence has been assumed within the ES.
	Aquatic invertebrate surveys	11.65	We have provided recent feedback on the locations of aquatic invertebrate surveys that we felt were too limited and didn't include many points in areas that will be most impacted by the development. We hope this feedback has been taken on board. The assessments should consider how these additional aquatic surveys add to the information previously collected. Particularly regarding the value of the various parts of the site.	The location of macroinvertebrate sample points along the River Ebbsfleet has been designed to provide a representative spread across the length of the River Ebbsfleet within the Kent Project Site. Sampling has been completed during spring and autumn 2020 and can be replicated annually to provide a long-term baseline for the watercourse if required. Aquatic invertebrates were also sampled in standing water bodies at 19 locations across the Kent Project Site following consultation with the Environment Agency.
	Water voles	11.65	We are aware of a record for 2018 for water voles on Botany marshes (east), just outside of the development boundary, but within the peninsula. This should be verified with Kent Wildlife Trust.	Surveys of Botany Marsh East Local Wildlife Site have been undertaken and water vole presence confirmed.
	The River Ebbsfleet	11.86	We can confirm that whilst the River Ebbsfleet has no specific targets, the principle of no deterioration still remains and needs to be assessed.	An assessment of potential effects upon the River Ebbsfleet and associated communities has been undertaken, with due regard to a 'no deterioration' objective. Further information has been provided within Appendix 12.8: 'Water Framework Directive (Screening) Assessment: River Ebbsfleet' (Document Reference 6.2.12.8).

Consultee	Topic	Paragraph	Scoping Comments	Response/Action Taken
		11.86	Our previous comments to the 2014 scoping report also recommends the applicant to obtain considerable baseline data for water quality on the River Ebbsfleet to ensure there is no deterioration shown from the surrounding developments proposed. We would like to reiterate this significance of obtaining substantial baseline data.	Sampling of a macroinvertebrate community at 4 sample points along the River Ebbsfleet has been undertaken on two occasions during spring and autumn 2020. Although samples point locations have been influenced by access constraints it is considered that they provide a representative overview of the River Ebbsfleet. An assessment of biological water quality was undertaken based on the calculation of biotic indices (BMWP/ASPT) of the macroinvertebrate community identified at each sample location, in addition to an assessment of their conservation value more generally. See 'Water Framework Directive (Screening) Assessment: River Ebbsfleet' (Document Reference 6.2: Appendix 12.8).
	Fish surveys	11.92	We would not consider it appropriate to scope out fish species in the Thames Estuary as a potential receptor. Migratory fish and juvenile life stages of fish species in the estuary can be adversely impacted upon by a range of construction, and permanent, physical developments in the sub- and intertidal areas, e.g. physical habitat modifications, percussive piling, dredging, water abstraction and discharges.	It is not proposed to scope out fish species in the River Thames. With reference to Chapter 13: Marine Ecology and Biodiversity (Document Reference 6.1.13), the Thames Estuary provides both spawning and nursery grounds for a number of marine species. As such, site-specific fyke net and seine net surveys have been undertaken to characterise the fish assemblages utilising habitats that could be effected by the Proposed Development. Intertidal fish surveys were also undertaken at four stations at the Kent Project Site during June 2020.
		11.93	Whilst fish communities in the Ebbsfleet may be limited, the proximity to the tidal Thames may find some species such as eel present in some of the freshwater systems present on the site. If this species is found to be present and works are carried out that negatively impact upon them, the Eel Regulations 2009 would apply. The EIA should address this risk.	No further fish surveys of the River Ebbsfleet have been proposed given barriers to fish and eel movement comprising significant culverts at the upstream and downstream extent of the watercourse whilst a fish assemblage surveyed during 2015 was limited to modest populations of roach and perch. Surveys of waterbodies across the Swanscombe marshes comprising electrofishing and fyke netting have been undertaken where access was available, in response to consultation with the EA.
		11.93	We would recommend fish surveys for River Ebbsfleet and marshes to ascertain which species are present and to consider habitat connectivity between the marshes and Thames/Ebbsfleet.	Further information regarding a scoping assessment for freshwater fish populations associated with the River Ebbsfleet, has been provided to Environment Agency for further comments and consultation in the form of an Ecology Briefing Note (Report reference: edp5988_r019 "Ecology Briefing Note: Further Information in Respect of an EIA Scoping Opinion"). With reference to this document, no fish surveys of the River Ebbsfleet was proposed given the presence of significant barriers to fish movement, combined with the modified nature and heterogeneity of habitat features. A formal response was received from the EA on 15 September 2020 (reference: KT/2020/127432/01-L01 - enclosed at the rear of this appendix) confirming they were in agreement with EDP's assessment of the River Ebbsfleet and associated fish communities and confirmed they did not consider further survey effort necessary. However, an ES should still have due regard to the future potential of the watercourse to support fish populations whilst the principle of 'no deterioration' in condition and water quality would apply. An assessment of impacts has therefore been included within the ES.
Kent County Council Ecological Advice Service - Helen Forster (Biodiversity Officer)	Surveys		We advise that the EcIA must clearly demonstrate why the survey area for each species is appropriate to ensure that it provides sufficient information to enable the determining authority to understand the ecological interest of the proposed development site.	All surveys have been undertaken with reference to best practice guidelines by competent and appropriately qualified ecologists, in some cases in exceedance of standard methodologies. Where deemed appropriate, specialist surveyors have been used.

Consultee	Topic	Paragraph	Scoping Comments	Response/Action Taken
			We advise that if the 2020 surveys indicate that there has been a decline in habitat/species from the previous surveys – the EIA must demonstrate why they are satisfied that the updated survey results are valid.	KCC's comment has been noted. The updated survey results are valid and represent the current ecological base line at the Project Site, as presented within Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement. Information on the predicted future ecological baseline has also been included.
			We highlight that due to the scale of the proposed development we would strongly recommend that updated botanical surveys are carried out to ensure the determining authority can fully understand the impact from the proposed development.	A full botanical survey was undertaken in summer 2020 by a specialist surveyor, the findings of which are presented in detail in Appendix 12.1: 'Ecology Baseline Report (Document Reference 6.2.12.1).
	Local Wildlife Sites		The scoping report has detailed that only 3 LWS out of 11 LWS within 2km of the site will be considered within the EIA. We advise that information must be included within the EIA clearly explaining why those LWS scoped out will not be assessed in detail – A LWS can still be negatively impacted by a development even when it is not directly adjacent / within the proposed red line boundary.	The Local Wildlife Sites included within the ecological assessment has been fully reviewed following receipt of consultation responses, and full justification for scoping out any local sites from inclusion in the Environmental Statement is provided - see Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement.
	Mitigation		We highlight that the submitted information must demonstrate that it has followed the mitigation hierarchy	Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement includes information on the application of the mitigation hierarchy.
			The proposal has referred to mitigation and enhancement however no reference has been made about compensation. Due to the scale of the proposed development it's our opinion that any impact cannot be fully mitigated on site and therefore we would expect any submission to provided details of any proposed compensation - as per the mitigation hierarchy.	The Proposed Development will provide a range of on-site mitigation measures, as summarised within Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement, with full details (specific to individual species/ species assemblages) provided within Appendix 12.3: Ecological Mitigation and Management Framework (Document Reference 6.2.12.3). To mitigate any residual impacts after the delivery of on-site mitigation, off-site mitigation will be provided, full details of which are to be secured through the Examination. To ensure the off-site mitigation meets the requirements of the various species/ species assemblage/ habitats affected, a range of general principles to be adhered to have been provided, see Appendix 12.10: General Principles for Offsite Ecological Mitigation (Document Reference 6.2.12.10).
			We would expect a detailed mitigation strategy to be submitted as part of any submission and the submitted plans to demonstrate that the proposed mitigation and compensation can be implemented.	Mitigation strategies for each species/species group have been provided within Appendix 12.3: Ecological Mitigation and Management Framework (Document Reference 6.2.12.3), which accompanies the ES. The level of detail is commensurate with the level of information available at this stage of the Proposed Development, and is considered sufficient to demonstrate that the individual needs of species/species groups can be met.
	Habitat Regulations Assessment		A recent decision from the Court of Justice of the European Union has detailed that mitigation measures cannot be taken into account when carrying out a screening assessment to decide whether a full 'appropriate assessment' is needed under the Habitats Directive. Therefore if the HRA screening identifies that there is a need for a mitigation to be carried out avoid a likely significant effect on the designated sites an appropriate assessment will have to be submitted with the submission. The determining authority have to undertake the Appropriate Assessment but the applicant must ensure that sufficient information is submitted with the submission.	A Shadow Habitat Regulations Assessment (Document Reference 6.2.12.4) has been produced assessing likely impacts upon European sites around the Project Site. In preparing the HRA, relevant case law has been taken into consideration. Mitigation is taken into account at the Appropriate Assessment stage.

Consultee	Topic	Paragraph	Scoping Comments	Response/Action Taken
	Net Gain		The report has not referred to Biodiversity Net Gain which is part of the Environment Bill which was introduced in to parliament in January 2020. Therefore we strongly recommend that the habitat data gathered is capable of being utilised as part of a Net Gain Calculation.	Within the current draft of the Environment Bill, as submitted to Parliament, Nationally Significant Infrastructure Projects (NSIPs) are exempt from the requirement to deliver 10% net gain. Nevertheless, the Applicant is submitting the Biodiversity Metric 2.0 on a voluntary basis to demonstrate a commitment to delivering net gain in accordance with the NPPF (see Appendix 12.2: 'Biodiversity Net Gain Assessment', Document Reference 6.2.12.2)
Gravesham Borough Council	Ecological value of marshes, and future management		The proposal develops a significant area of fresh (originally salt) marshes in Gravesham that are currently relatively undisturbed. The past history of the area means many locations have been significantly modified, particularly by chalk quarrying. This does not mean that they do not now have ecological value. It is noted that the area next to Britannia Refined Metals is now shown within the development boundary, along with Black Duck Marsh and the tip of the peninsula as landscaped areas. Clarity is need on what is, or is not, proposed for these areas and how they will be managed in the future. Public Rights of Way need to be maintained including the recently created section of Coastal Path.	A Landscape Strategy has been produced that outlines measures to be implemented across retained green space within the Order Limits. It should be noted that these areas will be managed primarily for their ecological value, and their current ecological value has been taken into account. A managed retreat around the northern edge of the peninsula is proposed, which will result in a net gain in the amount of saltmarsh habitat. Details of long term management and maintenance are provided within Appendix 11.8: Landscape Management Plan (Document Reference 6.2.11.8), and specifically to ecology features see the Ecological Mitigation and Management Framework (Document Reference 6.2.12.3)
Dartford Borough Council	General		The Council procures specialist technical advice from the KCC archaeology team and the KCC ecology team and this advice is incorporated into this response but is also likely to be passed onto you by Kent County Council and the Ebbsfleet Development Corporation (EDC).	The DBC response echoes the comments made by the KCC ecology team who provide specialist technical advice to the council. The comments made are therefore addressed within the response to KCC comments above.
Thurrock Council	Survey methodologies		The proposed survey methodologies follow the relevant good practice guidelines and therefore are broadly supported.	Thurrock Council's comments are noted.
	Essex surveys		Previous surveys undertaken to inform earlier iterations of the scheme were undertaken in 2012 and 2016; however these did not include the Essex Project Site as it was not part of the original proposals.	Where appropriate, based on the nature and extent of habitats present, ecological surveys have been undertaken at the Essex Project Site.
	Impacts on SSSIs - Essex Project Site		Paragraph 11.36 of the main document states that 'following a review of the additional SSSIs located within the potential zone of influence of the Essex Project Site, it is not considered that any of (those) designations would experience a potential adverse risk due to their geographical separation or lack of effect-receptor pathways'. It is agreed that the additional land within Essex would not increase the potential impacts on these sites.	The final suite of SSSIs to be assessed within the Ecological Impact Assessment has been determined following review of comments made by Thurrock Council and other statutory consultees, and through collaboration with other project disciplines such as Air Quality.
	Impacts on LWSs - Essex Project Site		It is agreed that of the Local Wildlife Sites within 2km of Tilbury only Tilbury Marshes should be scoped in. While the proposed scheme does not appear to encroach directly onto this site, surveys should consider potential indirect effects. In addition opportunities to provide a softer edge beside the LWS should be considered as part of the enhancement measures.	Thurrock Council's comments are noted and potential for indirect effects are considered within Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement
	Open Mosaic Habitat on Previously Developed Land		It is noted that Open Mosaic Habitat on Previously Developed Land, which is a Habitat of Principal Importance that can support important invertebrate assemblages is not included in the list of important Ecological Features in 11.65.	Open Mosaic Habitat on Previously Developed Land has been included as an Important Ecological Feature within Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement.

Consultee	Topic	Paragraph	Scoping Comments	Response/Action Taken
	Habitat Regulations Assessment		The proposal in 11.83-84 to provide a Report to Inform Assessment is supported. This will need to consider potential effects on the West Thurrock Lagoon and Marshes SSSI which is likely to be functionally linked to the nearby SPA/Ramsar sites.	Under Article 6(3) of the EU Habitats Directive (Council directive 92/43/EEC), an Appropriate Assessment is required where a plan or project is likely to have a significant effect upon a European site, which includes the network of protected sites across Europe called Natura 2000 sites. Natura 2000 sites include Special Protection Areas and Special Areas of Conservation. West Thurrock Lagoon and Marshes SSSI is not included within the Natura 2000 sites. Nevertheless, impacts on this SSSI are assessed within the Ecological Impact Assessment (EcIA) provided within Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12) of the Environmental Statement.
	Ecological Desk Study		The Summary of Protected/Notable Species Records (Appendix 11.23) references KMBRC findings but does not refer to any Essex Field Club and the Essex Wildlife Trust Biological Records Centre results. Can it be confirmed that records were sought from both of these?	A desk study has been carried out using information obtained from KMBRC and EFC. Information has been included within Appendix 12.1: Ecology Baseline Report (Document Reference 6.2.12.1)
	Scoping out bat, reptile and dormouse surveys		The Summary of Terrestrial Ecology Survey Methodologies (appendix 11.24) proposes no bat, reptile or dormouse surveys to be undertaken for the Essex Project Site. Given the lack of suitable habitat within the two component areas this is considered acceptable.	Thurrock Council's comments are noted and no surveys were conducted
	Invertebrate Surveys		It is unclear if any invertebrate surveys are proposed for the Essex Project Site. This is an area known to support important assemblages ofinvertebrates as identified on Buglife's All of a Buzz mapping. It is important that the small areas of habitat present are properly assessed and the results used to inform appropriate mitigation and enhancement measures.	An initial scoping study was completed in April 2020 along with a single invertebrate sampling event in May 2020. As described within Appendix 12.1: Ecology Baseline Report (Document Reference 6.2.12.1), following the May sampling event, on account of its relatively small size and unexceptional grassland and scrub habitat, it was decided that no further sampling would be undertaken in Area 19 - Tilbury Docks, Essex. The habitat selected tentatively within the scoping study, comprised a short stretch of road verge grassland and scrub habitat around TQ 64582 75464. Thus, no further sampling was undertaken within the Essex Project Site, with all remaining sample areas being located in the Kent Project Site.
	Tilbury Marshes		It is important to reiterate the point made by Kent County Council in its previous response regarding landscape (Table 10.2) that built, natural and historic environment together produce the character of our landscapes. This is particularly important for the Tilbury Marshes which is a remnant of the much larger coastal grazing marshes that once dominated the Thames, contains an important Scheduled Monument and has ecological importance. While the proposed scheme does not appear to have a direct impact on this area, indirect effects could further detract from its quality. Thurrock Council will be looking to see what mitigation and enhancement measures are proposed to enhance the setting of the marshes, Tilbury Fort and the Cruise Terminal. The proposed Landscape and Ecology Management Plan (paragraph 1.90) should address this area.	The potential for indirect effects to Tilbury Marshes is assessed, and any mitigation required, from a landscape and visual perspective (see Chapter 11: Landscape and visual effects (Document Reference 6.1.11)) and from an ecological perspective (see Chapter 12: Terrestrial and Freshwater Ecology and Biodiversity (Document Reference 6.1.12)).

Consultee	Topic	Paragraph	Scoping Comments	Response/Action Taken
Port of London Authority	Fish surveys		It is proposed to scope out fish due to very few fish species being recorded in the 2015 survey within the Thames Estuary. This should be revisited as it is contrary to Section 12 of the Scoping Report and at the moment limited details are provided regarding the works to existing river structures and the proposed new structures. Surveys have been undertaken recently by the Applicant and these should be reviewed, and more detail provided on the in river works before scoping out fish.	Further information regarding a scoping assessment for freshwater fish populations associated with the River Ebbsfleet, Swanscombe Marshes and River Thames, was provided to the Environment Agency for further comments and consultation in the form of an Ecology Briefing Note (Report reference: edp5988_r019 "Ecology Briefing Note: Further Information in Respect of an EIA Scoping Opinion", copy enclosed at the rear of this appendix). With reference to this document, no fish surveys of the River Ebbsfleet were proposed given the presence of significant barriers to fish movement, combined with the modified nature and relative homogeneity of habitat features. No survey of the Swanscombe marshes was proposed given poor water quality across waterbodies, evidence of contamination, high alkalinity and limited, saline intrusion and poor habitat. Intertidal fish surveys of the River Thames have, however, been undertaken, the results of which are provided within ES ecology Marine Chapter and supporting appendices. A formal response was received from the EA on 15 September 2020 (reference: KT/2020/127432/01-L01). The EA confirmed they were in agreement with EDP's assessment of the River Ebbsfleet and associated fish communities and confirmed they did not consider further survey effort necessary. However, an ES should still have due regard to the future potential of the watercourse to support fish populations whilst the principle of 'no deterioration' in condition and water quality would apply. An assessment of impacts have therefore been included within the ES and further communicated within a WFD Screening Report for the River Ebbsfleet (report reference: edp5988_r029; ES Appendix 12.8). The EA similarly confirmed they were in agreement with EDP's assessment of the Swanscombe Marshes with respect to a fish community. However, further survey of suitable waterbodies for a fish community were progressed during September 2020 inform a mitigation strategy given proposed loss of several drains/ponds, with potential effects assessed within the ES. Further fish surveys of waterbodies comprising Swanscombe Marshes (where access was available) confirmed the continued absence of a significant fish assemblage. No fish were captured at any of the survey sites or observed during survey effort whilst the ditch network across Botany Marsh was predominantly dry.
	Phase 1 Habitat Plan		Drawing number edp5988_d047 lists the Thames as standing water. It is not and that reference will significantly affect how the Thames is assessed particularly for navigation. Mud will also extend beyond the low tide level.	The Phase 1 Habitat Plan has been updated to show the River Thames as moving water (tidal), with direction of flow indicated. It is acknowledged that mud extends beyond the low tide level, but for the purposes of the Phase 1 Habitat plan, the extent of intertidal mud running to the low tide level is considered sufficient.
	WFD within ES		Reference to the Water Framework Directive (WFD) is spread across three different chapters of the Scoping Report and it is not well cross-referenced which makes it confusing to follow. The terrestrial and freshwater ecology chapter of the ES is one place where the WFD is mentioned.	References to the WFD have been reviewed as part of updating the Environmental Statement ready for submission

The London Resort
Ecology Briefing Note – Natural England Consultation
edp5988_r022

1. Introduction

1.1 This Ecology Briefing Note has been prepared by the Environmental Dimension Partnership Ltd (EDP) in response to comments made during a meeting on 10 August 2020 by Sean Hanna (Senior Advisor, Natural England) regarding impacts upon European Sites by the proposed London Resort development.

1.2 Two points will be addressed within this note, as follows:

- Mitigation hierarchy – Natural England raised concerns that the ecology strategy for the Proposed Development does not adequately follow the mitigation hierarchy, i.e. avoid, mitigate, compensate; and,

- Insufficient winter bird survey data – Natural England questioned the lack of two consecutive years of survey data for winter and passage bird surveys and the suitability of the data to assess indirect impacts upon off-site Sites of Special Scientific Interest (SSSIs).

2. Mitigation Hierarchy

2.1 The mitigation hierarchy requires that the design of a development follows what is known as the mitigation hierarchy to reduce impacts upon Important Ecological Features (IEFs). The Chartered Institute for Ecology and Environmental Management (CIEEM) guidelines for Ecological Impact Assessment (EcIA)[1] outline the principles as follows:

"Avoidance: Seek options that avoid harm to ecological features (for example, by locating on an alternative site).

Mitigation: Negative effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation.

Compensation: Where there are significant residual negative ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.

[1] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

Enhancement: Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation."

2.2 The Project Site, which includes land on Swanscombe Peninsula on the Kent side of the River Thames ('the Kent Project Site') and land immediately to the east of the port of Tilbury on the Essex side of the River Thames ('the Essex Project Site'), was chosen by the project team after careful consideration of a number of sites from a wide search area which included land within 100km of central London. The full consideration of alternative sites and site selection process is detailed in full in Chapter Four '*Alternative sites and project evolution*' of The London Resort Environmental Impact Assessment (EIA) Scoping Report submitted to the Secretary of State on 17 June 2020.

2.3 The Project Site was selected as the preferred location following review of a number of criteria including (in no order of priority) land availability, land use, planning and environmental constraints, proximity to and connectivity with central London, transport and accessibility, regeneration and economic benefit and micro-climate. The Swanscombe Peninsula was subsequently chosen as it offers a unique combination of advantages, as detailed in Chapter 4 of the EIA Scoping Report:

"It centres upon a large and generally unused brownfield site with a broadly level terrain, large enough to accommodate a full resort development. It is close to the edge of London but outside of the metropolitan green belt. It lies only 1 km north of Ebbsfleet International Station, which offers high speed train connections to London St Pancras International station with a journey time as low as 17 minutes and services to and from continental Europe.

Strategic highway routes in the locality include the A2(T), which passes 3 km to the south of the peninsula and provides a connection to Junction 2 of the M25 motorway to the west and onwards into London. The Dartford Tunnels and Queen Elizabeth II Bridge crossings of the River Thames lie approximately 3 km to the west of the site. The Swanscombe Peninsula does not contain any international or national wildlife or heritage designations, and it offers the potential to dovetail the resort development with significant local economic regeneration initiatives."

2.4 Having determined the best location of the entertainment resort, the development layout for the site was appraised with consideration of a number of variables including (but not limited to) existing land use, land ownership, ground conditions, drainage, land contamination, local terrain, and transport requirements. From an ecological perspective, the development layout has been situated to avoid impacts on the most sensitive habitats where possible, and retains areas of habitat within Black Duck Marsh, Botany Marsh Local Wildlife Site and Broadness marsh, as well as areas of semi-natural habitat within Bamber Pit and through the Ebbsfleet Valley, and the majority of the existing saltmarsh and inter-tidal mudflats around the edge of Swanscombe Peninsula. Furthermore, the land take from the Proposed Development mostly includes existing development or formerly developed land and landfill sites. In order to deliver a viable entertainment resort, the site needs to be large enough to accommodate the entertainment resort, including a theme park, attendant visitor attractions and amenities, hotels and transport facilities. Some habitat loss is therefore unavoidable.

2.5 Positioning the resort further west or north within the Swanscombe Peninsula, whilst avoiding impacts upon Botany Marsh west and the Channel Tunnel Rail Link (CTRL) wetlands, would necessitate loss of further wetland habitats within Black Duck Marsh and bring the development closer to the estuary front. Black Duck Marsh is considered to be 'functionally linked' to nearby statutory designated sites, including the Thames Estuary and Marshes Ramsar/Special Protection Area (SPA)/SSSI and the Medway Estuary and Marshes Ramsar/SPA/SSSI, as it supports various waterfowl species over winter. Furthermore, it also supports a diverse breeding bird assemblage not associated with the aforementioned designated sites, including small populations of breeding pochard (*Aythya ferina*), bearded tit (*Panurus biarmicus*) and Cetti's warbler (*Cettia cettia*). On balance it is considered that situating the resort further west on the peninsula would have greater ecological impact.

2.6 The ecology strategy is being developed to mitigate and compensate for negative impacts remaining the first 'avoid' stage of the mitigation hierarchy. This will include mitigation for impacts to the mosaic of habitats within the Kent Project Site, and associated fauna. A range of ecological enhancements are being developed across retained areas of the peninsula including new saltmarsh creation, improved water management strategy to maintain and enhance existing wetlands and create new wetlands, extension of the inter-tidal zone at low lying areas along the shoreline through managed retreat, and enhancement to existing grassland to create species-rich wildflower meadow, collectively creating a site-wide mosaic of habitats. The strategy will also address the current threat to the open-mosaic habitats present across the peninsula through lack of management and encroachment of scrub with large areas of the peninsula becoming dominated by dense scrub, eventually reaching the climax stage of natural succession of woodland and losing open, early successional stage habitats. On-site enhancement will be combined with managed access to ensure areas are kept that are valuable to wildlife.

2.7 Due to the land take of the Proposed Development and the inability to totally avoid or mitigate the loss of habitats on-site, such as grazing marsh, it is considered necessary after avoidance and mitigation to provide some off-site compensation. Compensation land has not yet been secured, but it is intended will take the form of restored wetlands with some drier habitats on higher ground where possible. This will primarily compensate for the loss of functionally linked land on-site and will therefore be situated as close as possible to the Thames Estuary & Marshes Ramsar/SPA/SSSI and Medway Estuary Ramsar/SPA/SSSI, and within the Greater Thames Marshes Nature Improvement Area. Through the off-site completion land the applicant is also committed to delivering a net biodiversity gain, in line with the current requirements of the National Planning Policy Framework (NPPF) (Paragraph 170. d).

3. Winter Bird Survey Data

3.1 In their EIA Scoping response, Natural England confirms that, to inform the Environmental Statement, "*…detailed survey information will be required and a minimum of two seasons of recent bird survey data is normally required to provide a robust baseline for the environmental assessment.*"

3.2 The Environmental Statement and Habitats Regulations Assessment (HRA) to be submitted along with the Development Consent Order (DCO) application will be informed by a comprehensive suite of wintering, passage and breeding bird survey data collated during winter 2019/2020 through to spring 2020. In addition, this recent data is supplemented by a suite of 'baseline' surveys completed by Chris Blandford Associates (CBA) during 2012/2013. Therefore, two seasons of bird survey data is to be submitted along with the DCO application, albeit not in consecutive years.

3.3 The wetland habitats within the Kent Project Site have not changed significantly in the intervening years between the 2012/2013 baseline surveys and the recent 2019/2020 surveys, and the data collected is more or less consistent across that time period. As set out in the Preliminary Environmental Information Report (PEIR) the wintering wader/wildfowl assemblage using the Kent Project Site has been valued at the International level owing to its association with the nearby Ramsar and SPAs. The assemblage, which is treated as an Important Ecological Feature (IEF) in the Ecological Impact Assessment, has therefore been valued at the highest level, and data from additional surveys will not affect this valuation or significantly alter the impact assessment and mitigation measures being developed.

Desk study

3.4 To further assess the ornithological interest at the Project Site a comprehensive desk study, based on Wetland Bird Survey (WeBS) data and local record centre data, has been updated in 2020. WeBS Core Count data was requested within two 'consolidations'[2]; the 'River Thames - QEII Bridge (Dartford) to Swanscombe' sector, which includes part of the site, and the 'Thames Estuary' consolidation, which includes most of estuary between Barking and Grain/Foulness. The extent of the 'Thames Estuary' consolidation is shown in **Figure EDP 3.1** below. The 'River Thames - QEII Bridge (Dartford) to Swanscombe' sector can be seen extending from the western edge of the Swanscombe Peninsula to the QEII bridge, on the south bank of the Thames.

Figure EDP 3.1: Extent of WeBS 'Thames Estuary' sector consolidation (excludes areas south and east of Lower Stoke). Approximate location of the Kent Project Site indicated by red dot.

[2] Consolidation refers to grouping of data from WeBS sectors, e.g. Thames Estuary refers to all sectors under the BTO location code 25901

3.5 There are a small number of gaps in the data, namely the developed areas of Gravesend, Canvey Island, Thames Haven and Southend and a small area of undeveloped foreshore along the north bank of the Thames between Tilbury and East Tilbury. The Inner Thames Marshes, West Thurrock Lagoon and Marshes SSSI, Thames Estuary & Marshes Ramsar/SPA/SSSI and Medway Estuary Ramsar/SPA/SSSI are included within the consolidation.

3.6 The lack of data for the area between Tilbury and East Tilbury could be considered a limitation, however, this area was surveyed over winter 2016/2017 and autumn 2017 by White Young Green (WYG) as part of the Tilbury2 Nationally Significant Infrastructure Project (NSIP), with data included within the Ecology chapter of the ES accompanying the DCO application[3]. This data can be utilised as further context for the results collected within the Project Site from CBA surveys in 2012/2013 and EDP update surveys in 2019/2020.

3.7 The data collected for the Tilbury2 project identified a winter bird assemblage using the foreshore between Tilbury Fort and East Tilbury of Local (Amber List species[4]) and District/Borough (Red List species) value, using habitat deemed to be functionally linked to the Thames Estuary & Marshes SPA. It is considered unlikely that the small increase in river traffic occurring as a result of the Propose Development will cause significant levels of disturbance to these habitats, which occur between 250m and 4.5km from the jetty at Tilbury, within an already busy shipping channel.

Indirect impacts on SSSIs

3.8 Natural England also raised a concern that indirect impacts on West Thurrock Lagoon and Marshes SSSI and the Inner Thames Marshes SSSI could not be assessed without surveying those sites. The potential indirect impacts identified by EDP in the EIA Scoping Report and PEIR are due to the loss and potential disturbance of habitat within the Kent Project Site which is assessed as being 'functionally linked' to the Thames Estuary and Marshes Ramsar/SPA/SSSI and Medway Estuary Ramsar/SPA/SSSI, and likely to the surrounding marshes, including those within the two SSSIs mentioned above. The potential for indirect impacts to West Thurrock Lagoon and Marshes SSSI and the Inner Thames Marshes SSSI, as a result of loss or disturbance of functionally linked land, is an impact which occurs as a result of changes to the baseline environment within the Kent Project Site itself.

3.9 Therefore, survey data collected from within the Kent Project Site by CBA in 2012/2013 and EDP in 2019/2020, in addition to the desk study data from across the Thames estuary, is considered sufficient for a robust assessment of likely significant effects required for EIA purposes. Further data collection across the Thames estuary of off-site SSSIs is not considered necessary.

[3] Proposed Port Terminal at Former Tilbury Power Station, Tilbury2, TR030003 Volume 6 Part A, Environmental Statement Document Ref: 6.1 (October 2017)

[4] Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746.

The London Resort
Ecology Briefing Note: Further Information in Respect of an EIA Scoping Opinion
edp5988_r019

1. Introduction

1.1 This Ecology Briefing Note has been prepared by The Environmental Dimension Partnership Ltd (EDP) on behalf of London Resort Company Holdings Limited (hereafter referred to as 'the Client') in relation to proposed development of land on the Swanscombe Peninsula, and the Ebbsfleet Valley, on the south side of the River Thames (referred to as 'the Kent Project Site', and land to the east of the A1089 Ferry Road and the Tilbury Ferry Terminal (referred to as 'the Essex Project Site'). Collectively these two parts of the Development Consent Order (DCO) boundary are referred to as 'the Project Site'.

1.2 A Scoping Opinion from the Planning Inspectorate (case reference: BC080001) was received by the Client during 2020 following submission of an Environmental Impact Assessment (EIA) Scoping Report in respect of proposed development of the Project Site, which sought to confirm and agree the scope of technical inputs required to inform an Environmental Statement (ES). Of pertinence to this Ecology Briefing Note are matters concerning Terrestrial and Freshwater Ecology and Biodiversity and Marine Ecology and Biodiversity detailed within Chapter 11 and Chapter 12 of the EIA scoping Report.

1.3 In response to proposals to scope out project effects on a fish community from a future ES, the following response was received from the Planning Inspectorate:

'The Scoping Report seeks to scope out these effects on the grounds that survey information shows very few species within these areas. This appears to contradict the statement in paragraph 12.73 of the Scoping Report which states that surveys are proposed. Accordingly, the Inspectorate does not agree to scope this matter out. The ES should assess impacts to fish populations in the Thames Estuary, Swanscombe Marshes and the Ebbsfleet Stream where significant effects are likely to occur. The Applicant should make effort to agree the approach to the assessment with relevant consultation bodies including the Environment Agency.'

1.4 This Ecology Briefing Note, therefore, seeks to provide additional information and clarification of EDP's position with respect to potential effects on a fish population within the River Thames, Swanscombe Marshes and River Ebbsfleet, for further consideration by the Environment Agency.

1.5 In addition, this Ecology Briefing Note also provides a summary of current ongoing investigations to inform an assessment of water quality within the Swanscombe Marshes and River Ebbsfleet and seeks further clarification on the requirement for a formal Water Framework Directive Assessment in respect of these waterbodies.

2. Identification of Important Ecological Features: Fish

River Ebbsfleet

2.1 The River Ebbsfleet flows south to north from the southern boundary of the Kent Project Site, downstream of the A2 dual carriageway and continues north of Ebbsfleet International Station where it is culverted under existing development at Northfleet before discharging into the tidal River Thames.

2.2 With respect to a fish population, a desk study request to the Environment Agency confirmed there are no Environment Agency monitoring stations along the River Ebbsfleet and no historical data with respect to chemical and biological water quality data, including assessment of fish and macroinvertebrate communities. This is with the exception of a single fish survey undertaken by the Environment Agency during 2007 (adjacent to Ebbsfleet International Station) during which no fish were captured.

2.3 A fish survey of the River Ebbsfleet was initially undertaken by Colclough and Coates Aquatic Consultants in 2015 to inform development proposals (see **Annex EDP 1**). The River Ebbsfleet from Springhead Nurseries downstream to the crossing point of the North Kent railway line at Northfleet was subject to a visual survey whilst electrofishing and fyke nets were deployed at two locations close to the A226 Thames Way/A2260 junction. The sites fished represented those sections of the watercourse where access was possible.

2.4 Modest populations of mature roach (*Rutilus rutilus*) and perch (*Purca fluviatilis*) were captured during electrofishing and fyke netting operations. Three-spined stickleback (*Gasterosteus aculestus*) were common or abundant at all sites surveyed and were also observed within those water bodies where electrofishing and fyke netting was not possible. Nine-spine sticklebacks (*Pungitius pungitius*) were also found in both electrofishing and fyke netting operations.

2.5 The fish surveys undertaken by Colclough and Coates Aquatic Consultants identified no evidence of active recruitment to the fishery, such that a population present within the River Ebbsfleet is not self-sustaining in the long-term. Following informal discussions between Colclough and Coates Aquatic Consultants and local angling groups during 2015 it was considered that fish populations within the River Ebbsfleet could either be wash outs from local fisheries or may have been introduced by anglers.

2.6 It was further noted that suitable habitat for a notable fish population within the River Ebbsfleet is extremely limited, given the heavily modified nature of the watercourse. This was verified following a River Corridor Survey (RCS) and River Habitat Survey (RHS) undertaken by EDP during May 2020. Overall, the River Ebbsfleet is a realigned/straightened and heavily modified watercourse, relatively uniform in appearance and structure with limited in channel habitat diversity of value to a fish population and little variation in water flow, water depth and substrate.

2.7 Of further note, the River Ebbsfleet is culverted upstream of the Project Site and further culverted for circa 560m (as the crow flies) under Northfleet before it discharges into the River Thames.

Such engineered features are considered a significant barrier to the fish movement and migration, such that fish movement between the River Thames upstream to the River Ebbsfleet is extremely unlikely and considered negligible.

2.8 A fish community within the River Ebbsfleet is considered to be of no more than Site importance and has subsequently been scoped out of an EIA assessment. Although effects on fish populations are considered unlikely to be significant, a scoping exercise has also considered the survey and assessment of a local fish population as an indicator of water quality within the River Ebbsfleet. However, populations are considered to be constrained by the availability of suitable habitat rather than water quality and are unlikely to provide a robust indicator of water quality within the River Ebbsfleet. As such, no further fish surveys are to be undertaken in this respect.

Swanscombe Marshes

2.9 A fish survey of waterbodies across Swanscombe Marshes was initially undertaken by Colclough and Coates Aquatic Consultants in 2015 to inform development proposals (see **Annex EDP 2**). Open freshwater waterbodies in Swanscombe Marshes were subject to visual surveys during June 2015 whilst electrofishing gear was deployed at suitable locations in Swanscombe Marshes on 15 August 2015. This was combined with hand net sampling at a number of locations in Swanscombe Marshes and the western edge of Botany Marshes on the same date. Fyke nets were set overnight in the same locations as earlier electrofishing operations on during September 2015. The sites fished represented those waterbodies where access was possible.

2.10 Three-spined stickleback were present in small numbers, in isolated locations in the eastern complex of Swanscombe Marshes and on the bottom edge of Botany Marshes. No fish were captured anywhere in the western complex of Swanscombe Marshes despite suitable conditions. No fish were recovered from the fyke nets set out in these marshes either.

2.11 Recovery of the fyke nets indicated that bed conditions in the channels were anaerobic, whilst very dense blooms of water flea (*Daphnia sp.)* were observed throughout the main channels during both the electrofishing and fyke netting operations, thus indicating poor water quality which would limit a significant, healthy fishery. Some evidence of a polluting discharge was further noted in the eastern complex of Swanscombe Marshes.

2.12 A desk study exercise further noted the Environment Agency had previously undertaken a three-catch depletion electrofishing survey between NGR TQ 59605 75457 to TQ59671 75510 during 2007. No fish were captured.

2.13 Overall, survey effort identified a poor head of fish within waterbodies comprising Swanscombe marshes, likely attributed to poor water quality and anaerobic bed conditions in addition to saline intrusion and unstable water levels observed during 2015.

2.14 An Extended Phase 1 survey of the EIA site encompassing Swanscombe peninsula and undertaken by EDP during 2020 recorded an extensive network of drains and ditches throughout the marshes in addition to ponds and standing waterbodies. Each of these waterbodies were

subject to eDNA (water sampling) analysis in April 2020 to confirm presence/infer absence of great crested newt (*Triturus cristatus*) where access was available (as illustrated at **Annex EDP 3**). During survey effort, it was noted that the ditch system is predominantly devoid of both in channel and bankside vegetation with a substrate dominated by silt such that there are no/limited suitable habitat features for a significant fish population (illustrative photographs are provided at **Annex EDP 4**). Water conditions were turbid with the ditch system frequently disturbed by the local bird assemblage, likely contributing to poor water quality and trampling of bank side habitats. Indeed, dense algal blooms were often recorded in association with these waterbodies, indicating eutrophication. Several of these ditches were, furthermore, dry or otherwise ephemeral in nature and, therefore, unsuitable for a fish population.

2.15 Several large ponds/waterbodies were also recorded in association with the Swanscombe peninsula. These were largely inaccessible due to the prevalence of dense scrub and reeds, the latter of which had often colonised the full area of the waterbody such that no open water is visible. It is presumed that such waterbodies are either dry or otherwise hold limited water depth. Several of these waterbodies are associated with and/or adjacent to the industrial estate on the eastern edge of the peninsula. Evidence of contamination from industrial leachate was apparent here with several of these waterbodies reported to be highly alkaline in nature. Such water quality issues would naturally suppress a diverse and significant fishery.

2.16 Waterbodies across Swanscombe peninsula are largely isolated from one another with limited/negligible potential for movement of fish populations between waterbodies, whilst saline intrusion, pollution and eutrophication combined with limited diversity of microhabitats, would limit a diverse fish assemblage. It is, therefore, considered that the effects of the Proposed Development on fish populations associated with Swanscombe Marshes are unlikely to be significant, in EIA terms. effects on this receptor have therefore been scoped out of an assessment and no further survey/assessment is proposed.

River Thames

2.17 With reference to the Chapter 12 (Marine Ecology and Biodiversity) of the EIA Scoping Report, the Thames Estuary provides both spawning and nursery grounds for a number of marine species. As such, site-specific fyke net and seine net surveys have been proposed to characterise the fish assemblages utilising habitats that could be effected by development proposals.

2.18 Subsequently, an intertidal fish survey was undertaken at four stations by APEM at the Kent Project Site during June 2020 with further pertinent information provided below:

- At each station, double fyke nets were set in pairs perpendicular to the estuary and left over a full tidal cycle to sample fish and other mobile fauna. Each fyke consisted of a 1m high hoop and six progressively smaller hoops and a 5.3m long trap section with a 5m long leader manufactured from 10mm mesh;

- Four fish species (European flounder (*P. flesus*), seabass (*D. labrax*), eel (*A. Anguilla*) and herring *C. harengus*)) were identified across the four fyke netting stations with a total of 57 individuals recorded, including a very large seabass which was approximately 480mm long;

- Across all survey stations, flounder was the most frequently caught species with a total of 26 individuals, followed by seabass, eel and herring with 19, 10 and 2 individuals, respectively;

- Seine netting was conducted in the vicinity of fyke nets at slack high water using a micromesh seine of 15m in length and 2.5m deep and was deployed in an arc to trap any fish present. Two seine net deployments were conducted at adjacent but not overlapping locations at each sample station to increase the volume of water sampled;

- Eight fish species (Atlantic herring (*C. harengus*), goby (*Gobiidae*), 3-spined stickleback (*Gasterosteus aculeatus*), European perch (*Perca fluviatilis*), smelt (*O. eperlanus*), sprat (*S. sprattus*), seabass and flounder) were identified across five seine net stations with a total of 103 individuals recorded; and

- Across all survey stations herring was the most frequently caught species with a total of 77 individuals.

3. Water Framework Directive Assessment

River Ebbsfleet

3.1 The River Ebbsfleet (Water Framework Directive (WFD) Waterbody GB106040024190) was previously identified as a Heavily Modified Waterbody (HMWB) under the WFD until 2015. At this time, the River Ebbsfleet was considerate to be at 'moderate ecological' potential based with an objective to reach good potential by 2027. The waterbody's chemical status did not require assessment whilst supporting conditions for quantity and dynamics of flow supports 'good' status. Ecological potential is instead defined by the following mitigation measures:

- Retain marginal aquatic and riparian habitats; and

- Increase in-channel morphological diversity.

3.2 Justification for not for achieving 'good' potential by 2015 is, however, attributed to being disproportionately expensive and technically unfeasible.

3.3 Following progression of the second cycle River Basin Management Plans, however, the River Ebbsfleet has been 'de-classified' and no longer subject to assessment or management under the WFD with no subsequent classification of its current ecological potential.

3.4 Nevertheless, to assess the current biological water quality of the River Ebbsfleet and thus allow an assessment of the potential effects of the Proposed Development upon biological water quality, the aquatic invertebrate community was sampled at four locations along the length of the Rivers Ebbsfleet during May 2020 with further surveys proposed during Autumn 2020. It is understood that mitigation for the Project Site should ensure there is no deterioration in the water quality of the River Ebbsfleet, this objective being consistent with the requirements of the Water Framework Directive. It does, however, remain unclear whether a formal WFD Assessment is required following exclusion of the River Ebbsfleet from current River Bain Management Plans for the catchment.

Swanscombe Marshes

3.5 Waterbodies associated with Swanscombe Marshes are not classified under the WFD and, therefore, are not proposed for inclusion within a formal WFD Assessment. Following consultation with the Environment Agency, however, it is understood that an assessment of biological water quality is required in addition to chemical water quality previously proposed.

3.6 To date, sampling of the invertebrate communities within each waterbody has, therefore, been undertaken in accordance with best practise guidance[1] during May 2020 with further sampling proposed in August 2020. Samples will be identified to family level, with Biological Monitoring Working Party (BMWP) and Average Score Per Taxon (ASPT) scores to be calculated for each sample, to provide an assessment of current water quality within each waterbody.

4. Summary and Conclusions

4.1 This Ecology Briefing Note has been prepared by The Environmental Dimension Partnership Ltd on behalf of London Resort Company Holdings Limited in relation to proposed development of land on the Swanscombe Peninsula, and the Ebbsfleet Valley, on the south side of the River Thames.

4.2 Following a receipt of a Scoping Opinion from the Planning Inspectorate during July 2020, this Ecology Briefing Note seeks to provide additional information and clarification of EDP's position with respect to potential effects on a fish population within the River Thames, Swanscombe Marshes and River Ebbsfleet. Specifically, no further assessment of a fish community associated with the River Ebbsfleet is proposed based on the following findings/observations:

- Fish surveys undertaken by the Coclough and Coates Aquatic Consultants in 2015 identified a limited assemblage of coarse fish species with no evidence of active recruitment;
- A fish community is not considered a resident, self-sustaining population and have likely be introduced by anglers or otherwise are wash-outs from local fisheries;

[1] Murray-Bligh, J.A.D., Furse, M.T., Jones, F.H., Gunn, R.J.M, Dines, R.A. and Wright, J.F. (1997) Procedure for collecting and analysing macroinvertebrate samples for RIVPACS. Joint publication by the Institute of Freshwater Ecology and the Environment Agency, 162 pp

- The heavily modified nature of the watercourse and limited in channel diversity provides limited habitat for a significant fish assemblage; and

- Culverts upstream and downstream of the River Ebbsfleet and Project Site provide a significant barrier to the movement and migration of fish further preventing establishment of recruiting populations.

4.3 Similarly, no further survey of a fish community associated with Swanscombe Marshes is proposed based on the following findings/observations:

- Fish surveys undertaken by the Coclough and Coates Aquatic Consultants in 2015 identified a limited assemblage of fish species with populations considered limited due to poor water quality, anaerobic bed conditions, saline intrusion and unstable water levels observed during 2015; and

- Waterbodies across Swanscombe Marshes are isolated from one another with limited/negligible potential for movement of fish populations between waterbodies. There is limited habitat diversity within each waterbody for a significant fish population whilst poor water quality arising from eutrophication and/or chemical contamination would furthermore suppress a population.

4.4 It is, therefore, considered that the effects of the Proposed Development on fish populations associated with Swanscombe Marshes are unlikely to be significant, in EIA terms. Effects on this receptor have therefore been scoped out of an assessment.

4.5 With respect to the Thames Estuary, however, it is recognised that the Thames Estuary provides both spawning and nursery grounds for a number of marine species such that site-specific fyke net and seine net surveys have been proposed to characterise the fish assemblages utilising habitats that could be effected by development proposals.

4.6 In respect of proposed assessment of biological water quality within the River Ebbsfleet and waterbodies associated with Swanscombe Marshes, no formal WFD Assessment is proposed in this instance. It is, however, recognised that that there is the potential for significant negative effects to water quality arising from proposed development of the Project Site such that assessment in accordance with EIA guidelines is warranted. Of further pertinence, mitigation for the Project Site should ensure there is no deterioration in the water quality of the River Ebbsfleet in particular, this objective being consistent with the requirements of the Water Framework Directive. As such, a summary of proposed scope for assessment of biological water quality has been provided within this document.

Annex EDP 1
Fish survey of the Ebbsfleet Stream
(Colclough and Coates, 2015)

London Paramount Entertainment Resort

A Fish Survey of the Ebbsfleet Stream

September 2015

Aerial photograph courtesy of LRCH

Plate 1 Adult Perch *Perca fluviatilis*

Draft Report 14th December, 2015

Client: **CHRIS BLANDFORD ASSOCIATES LTD**

Project Manager : Steve Colclough BSc (Hons), FIFM, C.Env.

[redacted]

SC^2 Reference: CB/003

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CONTENTS

1.0 SUMMARY

1.0.1 Chris Blandford Associates (CBA) has been appointed by London Resort Company Holdings Limited ('LRCH or 'the Applicant') to coordinate a programme of ecological surveys to inform the Environmental Impact Assessment and design of the London Paramount Entertainment Resort (LPER) project ('the Entertainment Resort' or the 'Proposed Development').

1.0.2 The upper section of the Ebbsfleet Stream may be impacted as a result of the proposed development of a new access route from the A2 trunk road. The Environment Agency has limited information on the current status of fish communities associated with this watercourse. Colclough & Coates – SC^2 has been contracted by CBA to conduct a fish survey and report on the findings. Site investigations and access arrangements were conducted during July & August 2015. The survey fieldwork was conducted on 11/12 September, 2015.

1.1 Scope of Survey

1.1.1 Most of the watercourse from Springhead Nurseries downstream to the crossing point of the North Kent rail line at Northfleet was subject to visual survey. Electrofishing and fyke nets were deployed at two adjacent sites close to the A226 Thames Way/A2260 junction. Information was drawn from the only past Environment Agency survey at TQ 61501 74329, adjacent to Ebbsfleet Station, in 2007.

1.2 Survey Limitations

1.2.1 Site access proved to be the greatest limitation. The sites fished represented most of the open water sites where electrofishing and fyke netting proved practicable. A further site existed upstream adjacent to the CTRL railway bridge, but access for fishing gear was poor. Access to the upper river above the CTRL railway bridge was extremely poor.

1.3 Key Findings

1.3.1 Three-spined stickleback were common or abundant at all sites fished and were observed at a number not fished. Nine-spined sticklebacks were also found in both electrofishing and fyke netting operations. Modest populations of mature roach and perch were captured in these same operations. There was no evidence of active recruitment to either of these populations. The only area of mature riverine habitat capable of supporting more than minor species was that encountered at the sites adjacent to the A226/A2260 road junction, where the roach and perch were captured. Much of the channel is overwide and overgrown. Significant areas of open water are rare. The watercourse has been heavily modified, particularly in the upper reaches. The fish community encountered at the road junction sites suggest that river channel restoration projects could lead to significant improvement in the fish holding capacity of other reaches of the watercourse.

2.0 INTRODUCTION

2.0.1 To inform the Environmental Impact Assessment, Colclough & Coates – SC[2] have been engaged to provide a fish survey of the fish communities which might may be associated with the Ebbsfleet Stream. Salient features of the survey can be seen in Figure 1.

Figure 1 Ebbsfleet Stream Fish Survey September 11/12th 2015
Salient Features

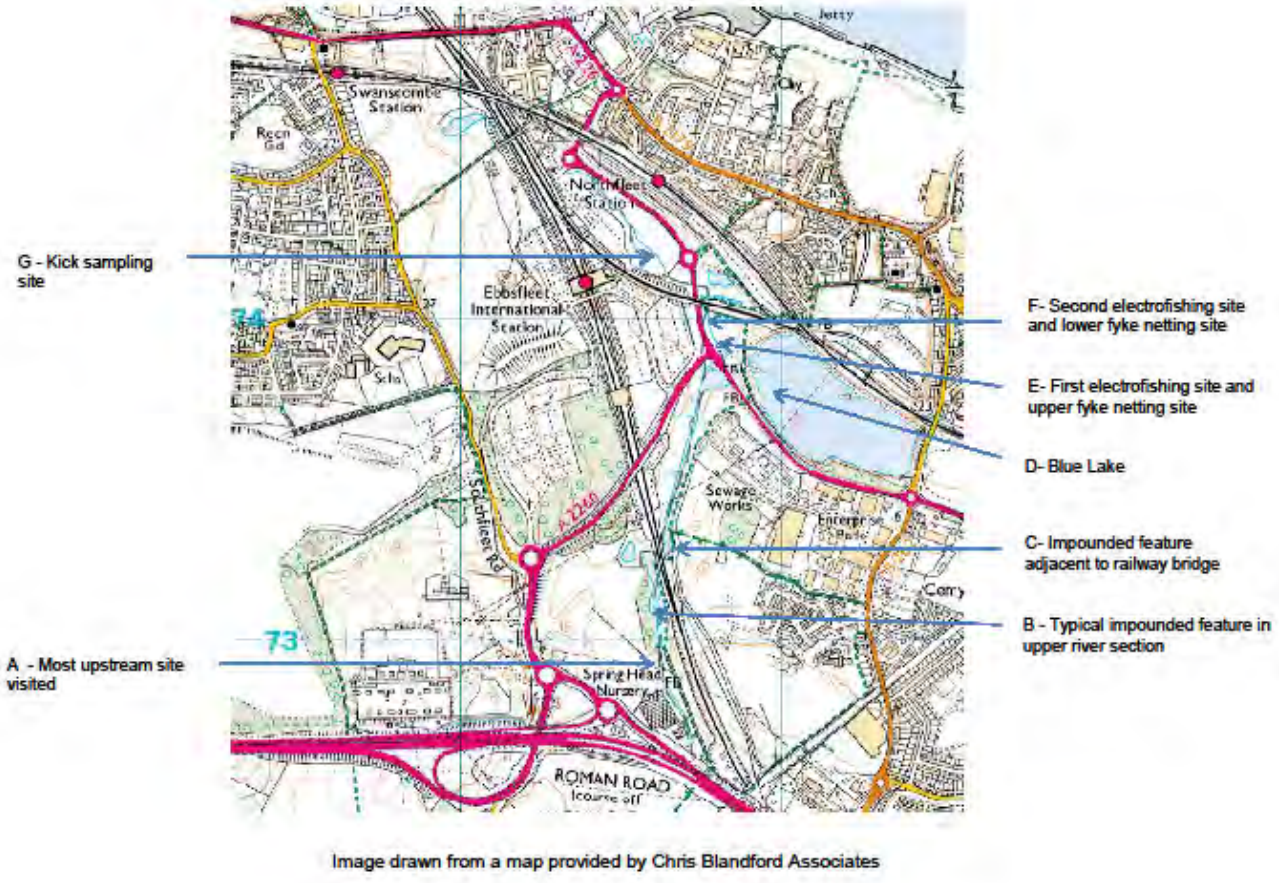

Image drawn from a map provided by Chris Blandford Associates

2.1 Ebbsfleet Stream

2.1.1 The Ebbsfleet Stream (or River) is a small calcareous watercourse running some 4km from its source at 8 original spring sources at Springhead north to discharge to the Thames at Northfleet Harbour.

2.1.2 The water course forms part of a rich local archaeological history. There were Roman settlements and an anchorage at Northfleet and Saxon water mills further upstream. In the 19th century, William Bradbery began the first commercial watercress company in the UK at Springhead in 1808 (Bellenden, 1822). By 1901, most of the water had been abstracted by the local water company. Marie Stopes (1903) conducted a botanical survey of the dried up areas or river bed. A large

proportion of the Ebbsfleet Valley has been damaged land arising from extensive chalk quarrying and subsequent land- fill. The Blue Lake is one local example of that history. (Ebbsfleet D & EF, 1996).

2.1.3 Construction of new tidal defences by the former Greater London Council modified the original discharge to the Thames by routing via a tidal flap valve and a closed culvert section. The Northfleet Harbour Restoration Trust has aims to restore the original form so as to permit the passage of migratory fish. The most recent impact on the watercourse was associated with the construction of the CTRL rail link in 2002.

2.1.4 The stream runs through areas of reed bed, marsh, rough grassland and scrub. With the Blue Lake, the stream supports an important range of complementary habitats forming a mosaic which is of county importance. This is recognised in its designation as a Site of Nature Conservation Interest (SNCI) within the Local Plans for the area. (Ebbsfleet D & EF, 1996).

Plate 2 Ebbsfleet Stream adjacent to A226/A2260 junction

3.0 FISH SURVEY METHODOLOGY

3.1 Walk over survey

3.1.1 Virtually the entire watercourse from Springhead Nurseries downstream to the crossing point of the North Kent rail line at Northfleet was subject to visual surveys during July and August, 2015. Photographs and details of the watercourse from the six key locations (A-C, E-F in Figure 1 above) appear in Appendix 3.

3.1.2 From the walkover survey it was evident that conventional fish survey equipment could only be applied at a very few locations. In a discussion with the Environment Agency it was agreed that the very small and overgrown nature of the watercourse to the south of the CTRL rail bridge precluded the application of any fish survey equipment here (J. Lyons, pers.comm). See photographs at Site A in Appendix 3.

3.2 Electrofishing and fyke netting

3.2.1 Electrofishing was applied on September 11th at sites E & F on Figure 1 (see also Appendix 3). Fishing was conducted with 230v regulated 2.75kva pulsed DC electrofishing equipment provided by Fisheries Solutions. The equipment was boat based with a single anode at Site E and set out on the bank with a 50m wander lead for site F. A 3 man team was supplied by SC^2 in conjunction with Fisheries Solutions. One staff member acted as banksman adjacent to the electrofishing control box, while the wander lead was in use at Site F.

3.2.2 The original intention had been to attempt semi-quantitative surveys between stop nets at Site E. A single 15m by 2m by 5mm stop net was deployed at the upstream point of Site E adjacent to the A226 Thames Way road bridge base, but instream weed and debris, shrub and tree growth rendered the setting of a second stop net at the lower end of the site impracticable.

3.2.3 Two small winged fykes net (5m by 0.5m, 3mm micromesh knotless mesh throughout, otter guards fitted) were set out overnight on September 11/12th, 2015. One fyke was set out at the upstream boundary of Site E and the second one in the centre of Site F.

3.3 Kick sampling

3.3.1 A standard biologists kick net (250mm wide frame, 300mm deep mesh bag with 1mm mesh throughout) was applied at Site G, in very overgrown conditions, in an attempt to capture small fish noted locally. This site is immediately adjacent to the Environment Agency site fished in July 2007

3.3.2 Captured fish were held in oxygenated tanks during the survey operations. All fish were identified, measured to the nearest millimetre and returned to the water.

4.0 RESULTS

4.0.1 Details of the fish captured and observations on those captures appear in Appendix 1. Photographs of exemplar fish appear in Appendix 2.

4.0.2 Three-spined stickleback *Gasterosteus aculeatus* ware found to be abundant at sites E & F with the electrofishing gear, at site F in the fyke net and were also captured in low numbers in the kick net at site G. Nine-spined stickleback *Pungitius*

pungitius were captured in low numbers at site E with both electrofishing gear and fyke net.

4.0.3 8 adult perch *Perca fluviatilis* at 235-320mm were taken by electrofishing at site E, along with 5 adult roach, *Rutilus rutilus* at 160-285mm. 4 adult perch at 240-275mm were taken with the same method at site F, together with 2 adult roach at 215-307mm.

4.0.4 2 adult perch at 263-268mm were recovered from the fyke net at site F.

4.0.5 The only ever Environment Agency fish survey in the Ebbsfleet Stream took place at TQ 61501 74329 on 7th July, 2007. This location is approximately 200m downstream of site G in this survey. A three catch electrofishing operation over a 100m section isolated with stop nets reported no fish captured. The survey reported a 4.5m wide channel with only 15cm depth of water and a heavy fine silt burden.

5.0 EVALUATION OF THE RESOURCE

5.0.1 The overall fish holding capacity of a small watercourse may be severely constrained if there is an inadequate supply of suitable habitat features available, such as depth and cover (N.R.A., 1991). Drawing from experiences in smaller water courses from elsewhere in the South East of England, it is quite possible that populations of larger fish, such as those of roach and perch taken at sites E & F, adjacent to the A226/A2260 road junction, are highly restricted in the Ebbsfleet Stream, given the poor habitat available in much of the watercourse (NRA, 1991 & 1993). The only other area of suitable habitat would appear to be in the overwide deep section around the CTRL Bridge (site C on Figure 1 and in Appendix 3).

5.0.2 Experiences from other small calcareous streams in the South East would suggest that local fish communities may feature cyprinids such as roach and perch, dace *Leuciscus leuciscus* and chub *Leuciscus cephalus*, together with bullhead *Cottus gobio* , brown trout *Salmo trutta* and eel *Anguilla anguilla*. (NRA, 1989).

5.0.3 Informal discussions with anglers from Thameside Works Angling and Preservation Society (TWAPS, who fish Blue Lake), brought several issue to light. Several anglers fished the Ebbsfleet stream in the 1980's. Roach, perch and dace were reported to be present in the lower reaches up to Blue Lake at that time.

5.0.4 No eels were taken during the current survey. Although often difficult to capture efficiently with electrofishing gear, they would probably have been taken in the fyke nets set overnight, if present. Anglers fishing the Blue Lake report regular captures of large eels, with no recruitment evident. Given the close association of the Blue Lake with the watercourse adjacent, it is entirely possible that the installation of a tidal flap valve at Northfleet Harbour as part of the former GLC tidal flood defence scheme in the 1970's brought to an end eel migration into the system.

5.0.5 There is a small balancing pond to the west of the CTRL bridge that discharges to stream immediately upstream of the rail bridge (Site C in Appendix 3) This had been previously managed as a carp fishery. Anecdotal information from TWAPS members suggests that escapee carp either were or may still be present in the deep pool around the bridge.

5.0.6 The condition of the roach and perch taken on both days at sites E & F were excellent, with no visible external lesions or parasites, fin ray or scale damage. There was no recruitment evident in either of these two populations. The smallest roach taken was 160mm and the smallest perch was 235mm. It would appear therefore that this is a not a resident self- recruiting fish community. These fish could either be wash-outs for connected on- line lakes or may have been introduced by anglers (NRA, 1991 & 1993).

5.0.7 Although they are not recruiting, the excellent condition of the fish does suggest that the availability of suitable habitat is constraining fish production, rather than water quality. This it suggests that any future river restoration initiatives on the Ebbsfleet Stream would probably see significant improvements in local fish communities.

6.0 CONCLUSIONS

6.0.1 The past history of the Ebbsfleet Stream has produced a highly modified low flow system with poor availability of suitable habitat for the fish species expected in small calcareous watercourses. Migratory passage probably ended with the 1970's tidal defence works at Northfleet Harbour. Future restoration processes could lead to significant improvements in riverine fish communities and restoration of the migration of species such as eel.

7.0 REFERENCES

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8.1 Appendix 1 Species captured in current survey Electrofishing 11th September, 2015

Site	Common Name	Latin Name	Fork Length
Upper site (E)			
	Three- spined stickleback	*Gasterosteus aculeatus*	
	Abundant		25-35mm
	Nine-spined stickleback	*Pungitius pungitius*	28mm
			30mm
			33mm
			N=3
	Perch	*Perca fluviatilis*	235mm
			320mm
			265mm
			295mm
			260mm
			240mm
			280mm
			265mm
			N=8
	Roach	*Rutilus rutilus*	285mm
			264mm
			285mm
			160mm
			275mm
			N=5
Lower site (F)			
	Three- spined stickleback	*Gasterosteus aculeatus*	
	Abundant		20-35mm
	Perch	*Perca fluviatilis*	270mm
			240mm
			275mm
			264mm
			N=4
	Roach	*Rutilus rutilus*	307mm
			215mm
			N=2

8.1 Appendix 1 Species captured in current survey Fyke netting 12th September, 2015

Site	Common Name	Latin Name	Fork Length
Upper site (A)			
	Nine-spined stickleback	*Pungitius pungitius*	
	10 in total		28-34mm
Lower site (B)			
	Three-spined stickleback	*Gasterosteus aculeatus*	
	11 in total		24-32mm
	Perch	Perca fluviatilis	263mm
			268mm
			N=2

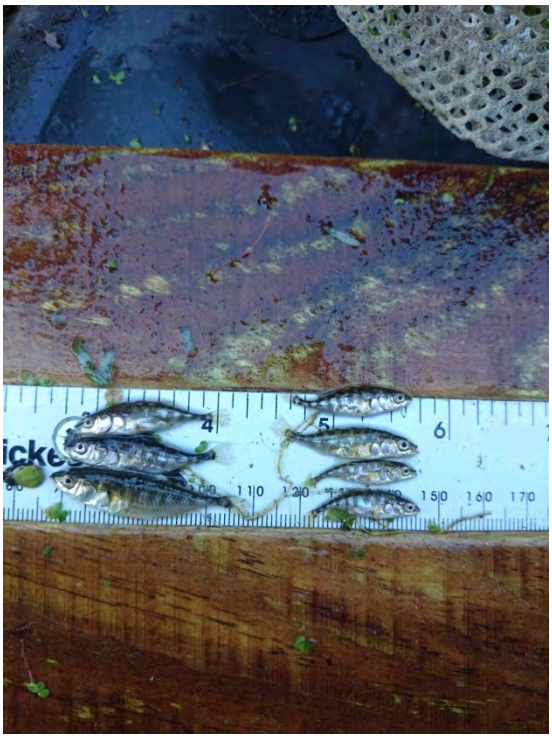
Observation notes:

All of the roach and perch captured were adult fish in excellent condition with no evidence of external lesions or parasites, scale or fin ray damage.

8.2 Appendix 2 Photographs of fish captured

Perch *Perca fluviatilis*

Roach *Rutilus rutilus*



Three-spined stickleback *Gasterosteus aculeastus*

Nine-spined stickleback *Pungitius pungitius*

8.3 Appendix 3 Site photographs and notes

Site A – Downstream of Springhead Nurseries

Looking upstream with nurseries on the right

Looking downstream

Notes: Heavily modified V shaped channel. Wetted area 1-2m. Maximum depth 15cm. No permanently open water. Main instream plant growth *Apium nodiflorum*. Substrate is gravel and fine muds.

8.3 Appendix 3 Site photographs and notes

Site B Typical Impoundments above CTRL rail bridge

Notes: Heavily shaded and overgrown in places. Very silted, and shallow (less than 30cm of water). Predominantly *Phragmites, Carex, Iris,* willow and alder. Stands of *Callitriche i*n open water**.**

8.3 Appendix 3 Site photographs and notes

Site C- Deep section adjacent to CTRL rail bridge

Looking upstream towards discharge from balancing pond

Notes: Open water with reeded margins. At least 1.5m deep in areas. Predominantly *Phragmites, Carex* and *Iris.* Stands of *Callitriche* in some open water areas. No vehicular access to site.

8.3 Appendix 3 Site photographs and notes

Sites E & F Adjacent to A226/A2260 road junction
Main fish survey sites

a) July

b) September

Notes: 7-14m wide. Maximum depth 1m. Rapidly overgrown in the late summer with *Callitriche, Ranunculus* and *Lemna*. *Apium nodifloum, Carex, Iris* and willow in the margins. Gravel bed overlain with heavy silt burden in areas. Limited invertebrate sampling with a kick net found alderfly larvae, caseless caddis, *Asellus* and bloodworm.

8.3 Appendix 3 Site photographs and notes

Site G – Kick sampling in heavily overgrown shaded conditions

Annex EDP 2
Fish survey of Swanscombe Marshes
(Colclough and Coates, 2015)

London Paramount Entertainment Resort

A Fish Survey of Swanscombe Marshes

September 2015

Aerial photograph courtesy of LRCH

Plate 1 Swanscombe Marshes

Draft Report 14th December, 2015

Client: **CHRIS BLANDFORD ASSOCIATES LTD**

Project Manager : Steve Colclough BSc (Hons), FIFM, C.Env.

[redacted]

SC^2 Reference: CB/004

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CONTENTS

1.0 SUMMARY

1.0.1 Chris Blandford Associates (CBA) has been appointed by London Resort Company Holdings Limited ('LRCH or 'the Applicant') to coordinate a programme of ecological surveys to inform the Environmental Impact Assessment and design of the London Paramount Entertainment Resort (LPER) project ('the Entertainment Resort' or the 'Proposed Development').

1.0.2 Colclough & Coates - SC^2 have been contracted to provide a survey of the fish communities associated with Swanscombe Marshes. Other commissioned works related to this proposal include: - a desk based review of the estuarine fish communities around Swanscombe Peninsula; a survey of fish associated with saltmarshes around the Peninsula; a study of fish in the Ebbsfleet Stream.

1.1 Scope of Survey

1.1.1 Virtually all of the open freshwater waterbodies in Swanscombe Marshes were subject to visual walk over surveys on 19th April, 19th June and 26th June 2015. Electrofishing gear was deployed at suitable locations in Swanscombe Marshes on 15th August 2015. Hand net sampling was conducted at a number of locations in Swanscombe Marshes and the western edge of Botany Marshes on the same date. Fyke nets were set overnight in the same locations as the earlier electrofishing operations on 11/12th September, 2015. Information was also drawn from the only ever Environment Agency fish survey in the marshes, which took place in 2007.

1.2 Survey Limitations

1.2.1 Site access proved to be the greatest limitation. The sites fished represented most of the open water sites where electrofishing and fyke netting proved practicable. Hand netting proved to be possible on an opportunistic basis at a number of small sites, but efficiency of capture was low, given channel overgrowth.

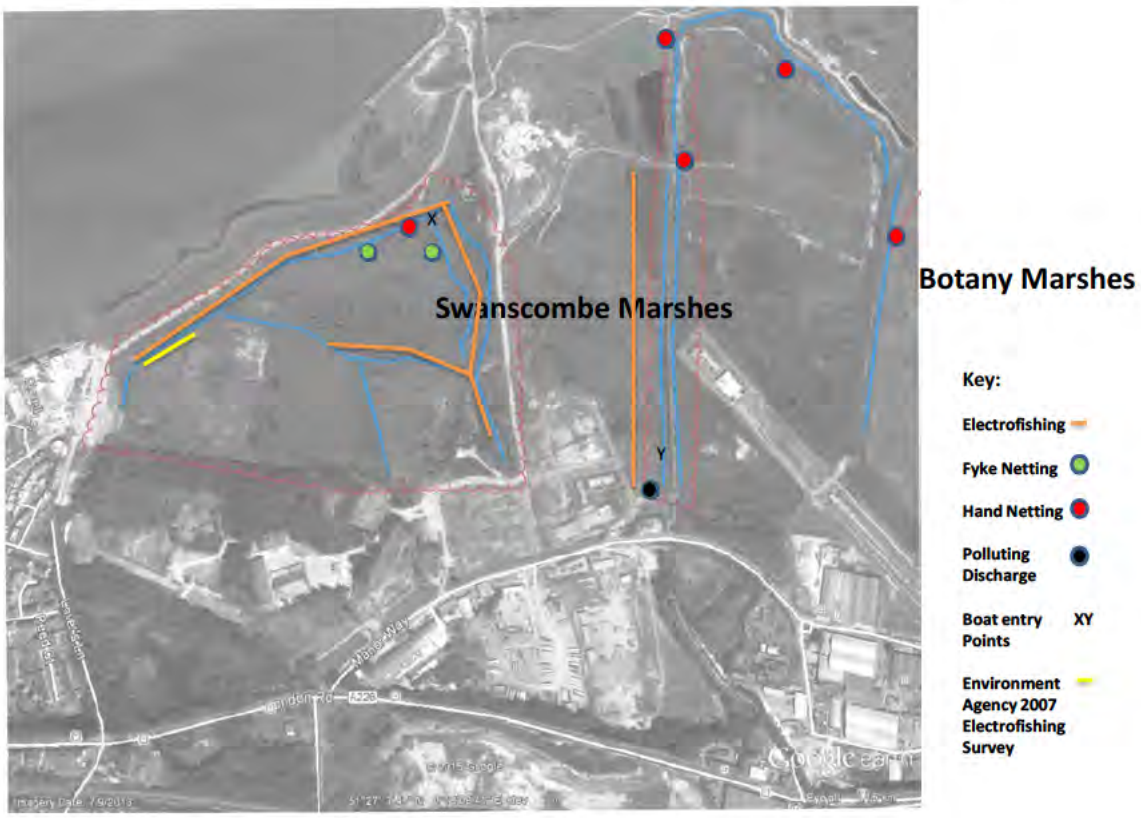
1.3 Key Findings

1.3.1 Three-spined stickleback *Gasterosteus aculeatus* were present in isolated locations in the eastern complex of Swanscombe Marshes. No fish were captured anywhere in the western complex of Swanscombe Marshes in spite of extensive coverage with electrofishing gear and fyke nets. Corixids, great diving beetle *Dytiscus marginalis* and the late larvae *of s*mooth newt *Lissotriton vulgaris* were noted commonly in one small area of marsh partly connected to the marsh channels, but were not evident in the main channels adjacent. Water levels in the western complex of Swanscombe Marshes appear to be unstable and dropped significantly between April and September 2015. Fyke net recoveries indicated anaerobic bed conditions. Dense blooms of *Daphnia* were in evidence in Swanscombe Marshes during August & September. Some evidence of a polluting discharge was noted at the southern end of the more westerly of the twin channels in the eastern complex of Swanscombe Marshes.

2.0 INTRODUCTION

2.0.1 To inform the Environmental Impact Assessment, Colclough & Coates – SC^2 have been engaged to provide a fish survey of the fish communities which are associated with the freshwater marshes on Swanscombe Peninsula. Salient features of the survey can be seen in Figure 1.

Figure 1 Fish Sampling Sites on Swanscombe Marshes



Developed from an image from LRCH

2.1 Swanscombe Marshes

2.1.1 Swanscombe Peninsula has a long industrial history, mainly connected with the cement industry. Swanscombe Marshes (also known as Black Duck Marshes) were originally saltmarsh, isolated progressively from the tidal Thames by sea defence structures some of which date back several hundred years. The sea wall was breached in the 1953 storm surge event.

2.1.2 The cement works have now gone, to be replaced with infrastructure associated with the CTRL link. There is small disused sewage treatment plant close to the CTRL infrastructure. Part of the site has been subject to past landfill and has

been raised. Kiln dust associated with the cement operations was tipped in the area around the head of the peninsula. (Gravesham Local Plan Core Strategy, 2013).

2.1.3 There are no formal biodiversity designations in the marshes, but recent research indicates that there are nature conservation interests on the peninsula. Marsh harriers have been spotted in recent years and there is a heronry associated with a small woodland area. (Gravesham Local Plan Core Strategy, 2013).

2.1.4 There is no verified information on the current status of fish life in the freshwater marshes on the Peninsula. Fish were thought to be present in both Swanscombe and Botany Marshes.

3.0 FISH SURVEY METHODOLOGY

3.1 Walk over survey

3.1.1 Virtually all of the open freshwater waterbodies on the Peninsula were subject to visual walk over surveys. These took place on 19th April, 19th June and 26th June 2015. Photographs taken from the surveys appear in Appendix 1.

3.1.2 From these investigations it was evident that conventional fish survey equipment could only be applied at a very few locations. Hand netting would be attempted at some of the smaller isolated sites where small fish were observed during the walk over surveys. The sites where all of the fishing operations were conducted appear in Figure 1 above. Photographs of the fishing methods and fish captured appear in Appendix 2.

3.2 Electrofishing

3.2.1 Fishing was conducted with 230v regulated 2.75kva pulsed DC electrofishing equipment provided by Fisheries Solutions. The equipment was boat based with a single anode. Most of the channel features in Swanscombe Marshes, highlighted in blue in Figure 1 were fished out and back from a boat entry point at X in Figure 1 on August 15th, 2015. No stop nets were deployed in these channels. Occasional debris blocks tended to isolate particular sections of channel.

3.2.2 Later in the same day, the electrofishing equipment was deployed in a similar manner on the western channel of the twin parallel channels in the eastern complex of Swanscombe Marshes, for the distance marked in orange in Figure 1, again out and back from entry point Y.

3.3 Fyke netting

3.3.1 Paired fyke nets (7 hoop double D, total length 10.6m otter guards fitted in first inscale) were set overnight on September 11/12th, 2015 in the locations marked in green in Figure 1.

3.4 Hand Netting

3.4.1 A standard biologists kick net (250mm wide frame, 300mm deep mesh bag with 1mm mesh throughout) was applied at the locations shown in red in Figure 1 on September 11th & 12th .

3.4.2 Captured fish were held in oxygenated tanks during the survey operations. All fish were later identified, measured to the nearest millimetre and returned to the water.

4.0 RESULTS

4.0.1 Three-spined stickleback *Gasterosteus aculeatus* were found to in small numbers at all of the sites shown in red in Figure 1 in Swanscombe Marshes and on the western edge of Botany Marshes. No fish at all were captured, or seen, in the electrofishing operations in the western complex in Swanscombe Marshes, in spite of shallow (less than 1m) clear conditions on a bright day. No fish were recovered from the fyke nets set out in these marshes either. Recovery of the fykes indicated that bed conditions in the channels were anaerobic. Very dense blooms of *Daphnia* were observed throughout the main channels during both the electrofishing and fyke netting operations.

4.0.2 Corixids, Great Diving Beetle *Dytiscus marginalis* and the late larvae of smooth newt *Lissotriton vulgaris* were noted commonly in one small raised area of marsh partly connected to the main channels, close to boat entry point X in Figure 1. These species were not captured or seen in the main channels adjacent, or indeed at any other survey site. Water levels in Swanscombe Marshes were noted to have dropped significantly between April and September 2015.

4.0.3 Neither electrofishing nor fyke netting yielded any fish at all in the western twin channel in the eastern complex. During the electrofishing operation, there was evidence of a discoloured discharge entering the southern end of the channel. Again, very heavy Daphnia blooms were in evidence in the channel. Fyke net recovery indicated anaerobic bed conditions.

4.0.4 The only ever Environment Agency survey in Swanscombe Marshes was conducted on 11th July, 2007. A three catch depletion electrofishing operation was mounted over a 100m section isolated with stop nets. No fish were captured at all. The survey team reported a heavy silt burden. The site was fished from TQ 59605 75457 to TQ59671 75510. This is shown in Figure 1 in yellow, towards the western end of Swanscombe Marshes.

5.0 EVALUATION OF THE RESOURCE

5.0.1 The habitat available in Swanscombe Marshes would suggest it is capable of supporting a community of freshwater cyprinids and eels, as reported from other freshwater marsh dyke systems adjacent to the Thames estuary (NRA 1990 & 1995).

5.0.2 Water quality information provided by CBA from the Lefarge monitoring programme for the eastern complex at Swanscombe Marshes indicated some saline intrusion with a gradient falling away from the sea defences. This situation occurs in many other marsh systems along the Thames estuary. (NRA 1990 & 1995). Brackish conditions would have hampered the electrofishing operations given the elevated conductivity, but the gear would still have worked efficiently away from the sea walls. If significant numbers of fish were present, they would have been at least seen during the electrofishing and taken in the fyke nets.

5.0.3 One other interesting observation was that water levels in the western complex appear to be unstable. Google Earth images of the western complex in Swanscombe Marshes show extensive dry vegetated ground with defined drainage channels from 1940 to at least 2010. The 2013 image clearly shows flooding of the site, which has progressed further by the time of the current April, 2015 image. Photographs in Appendix 1 demonstrate die back of some shrubs, which can be consistent with changing water and/or salinity levels. Some of the same photographs show that water levels dropped significantly from April 2015 to August, 2015. In short, the site has the appearance of a developing marsh, but with unstable conditions.

5.0.4 If saline intrusion is occurring and increases in future, there are few fish other than the eel *Anguilla anguilla* that can thrive in such brackish marshy conditions. If the intrusion stabilises, then with greater maturity Swanscombe Marshes could support a significant head of fish typical of freshwater grazing marshes, such as eel, rudd (*Scardinius erythropthalmus),* crucian carp (*Carassius carassius*) and tench (*Tinca tinca*). These communities do exist elsewhere in similar conditions adjacent to the Thames estuary (NRA 1990 & 1995).

6.0 CONCLUSIONS

6.0.1 Swanscombe Marshes supports a very poor head of fish. The reasons for this are not clear at present. However, anaerobic bed conditions, saline intrusion, unstable water levels and polluting discharges may be implicated at least in some areas. It is also possible that the western complex is a “new” marsh in the early stages of development. Greater maturity and stability might well see the marsh support a significant head of typical fish species in the future.

7.0 REFERENCES

Swanscombe Peninsula Position Statement May 2013 Submission Gravesham Local Plan Core Strategy May 2013

National Rivers Authority. (1990 & 1995). A Fish Population Survey of the Marsh Dykes, Thamesmead. .

8.1 Appendix 1 Photographs of Swanscombe Marshes

Western Complex

Notes: Top left & top right – April, 2015. Centre – 19th June, 2015. Note die back. Bottom – 15th August, 2015. Note reduced water level (approx.. 50cm).

8.1 Appendix 1 Photographs of Swanscombe Marshes

Eastern Complex

Notes: Top left & right - western channel 15th August 2015.Note whitish polluted discharge near southern head of channel at top left.

Bottom left - August 15th, 2015. Typical small open water area in eastern complex that held numbers of 3 spined stickleback.

8.2 Appendix 2 Fishing Methods

Electrofishing

Fyke Netting

Notes: Top left - Swanscombe Marshes, Western complex.

Top right - western channel of eastern complex.

8.2 Appendix 2 Fishing Methods

Hand netting

Notes: Top left and right - 15th August, 2015. Small semi- isolated area of raised marsh supporting a range of fauna but not fish.

Bottom left - Great diving beetle *Dytiscus marginalis* taken at above site.

Bottom right - Three-spined stickleback *Gasterosteus aculeastus* taken in eastern complex.

Annex EDP 3
GCN Survey Schedule
(edp5988_d063a 23 July 2020 PD/JB)

N

DCO Boundary

250m Buffer

Pond/Waterbody (Surveyed)

Pond/Waterbody (Not Surveyed)

Ditch (Surveyed)

Ditch (Not Surveyed)

P1 Pond/Waterbody Numbers

D1 Ditch Numbers

Warty Newt/Great Crested Newt Record (KMBRC)

P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12 P13

D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 D16 D17 D18 D19 D20 D21 D22 D23 D24 D25 D26 D27 D28 D29 D30 D31 D32 D43

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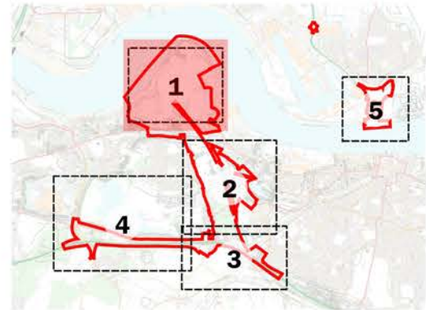

client

The London Resort Company Holdings Ltd

project title

The London Resort

drawing title

Plan EDP 19: GCN Survey Schedule (Sheet 1 of 5)

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drawing number	edp5988_d063a	checked	JB
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the environmental dimension partnership

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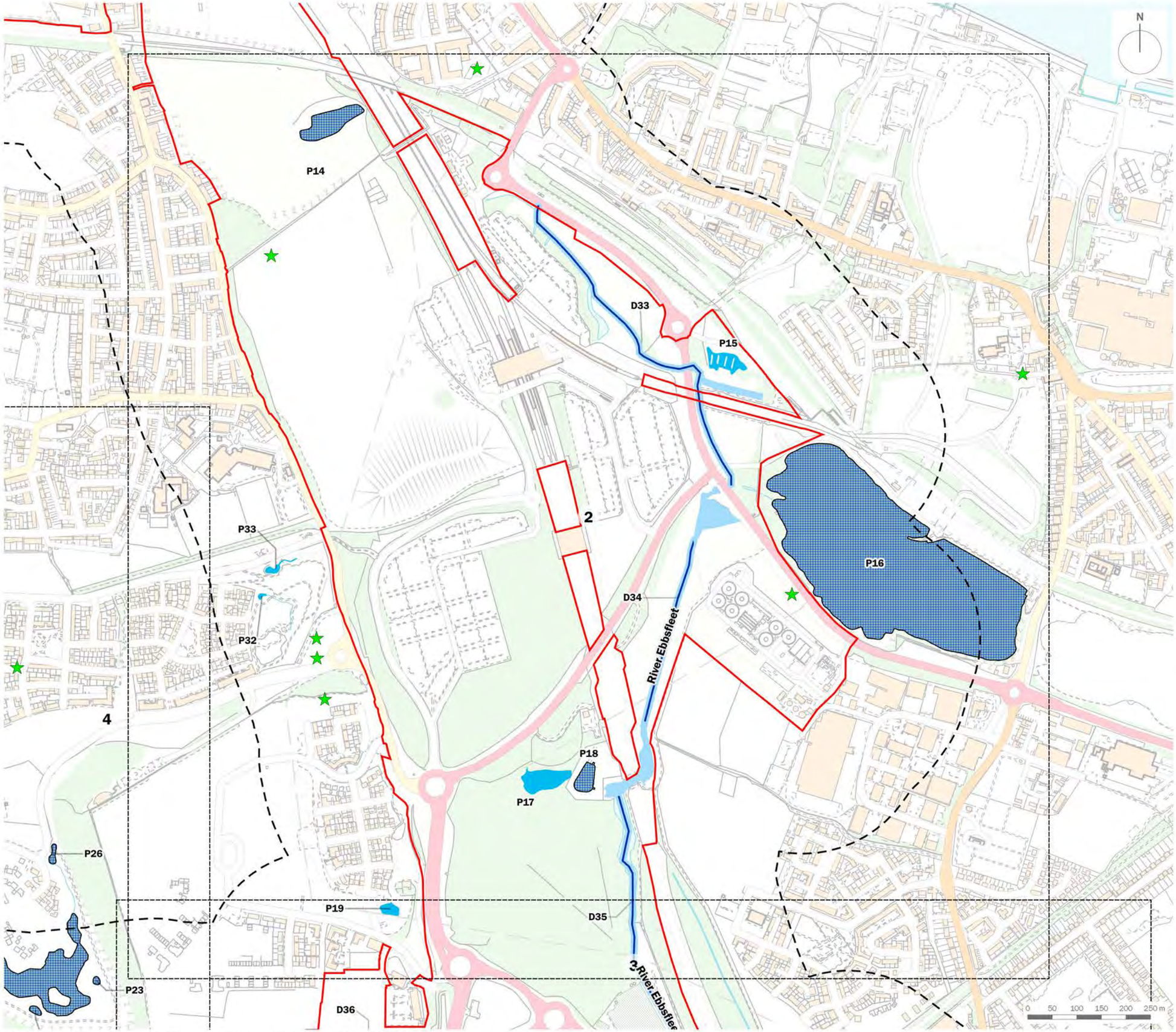


DCO Boundary

250m Buffer

Pond/Waterbody (Surveyed)

Pond/Waterbody (Not Surveyed)

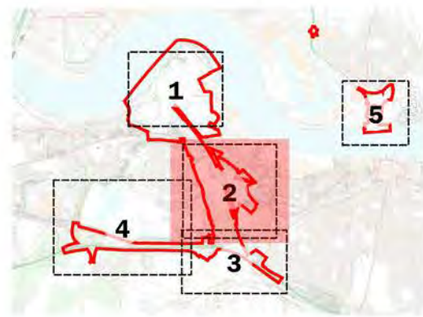
Ditch (Surveyed)

Ditch (Not Surveyed)

P1 Pond/Waterbody Numbers

D1 Ditch Numbers

Warty Newt/Great Crested Newt Record (KMBRC)



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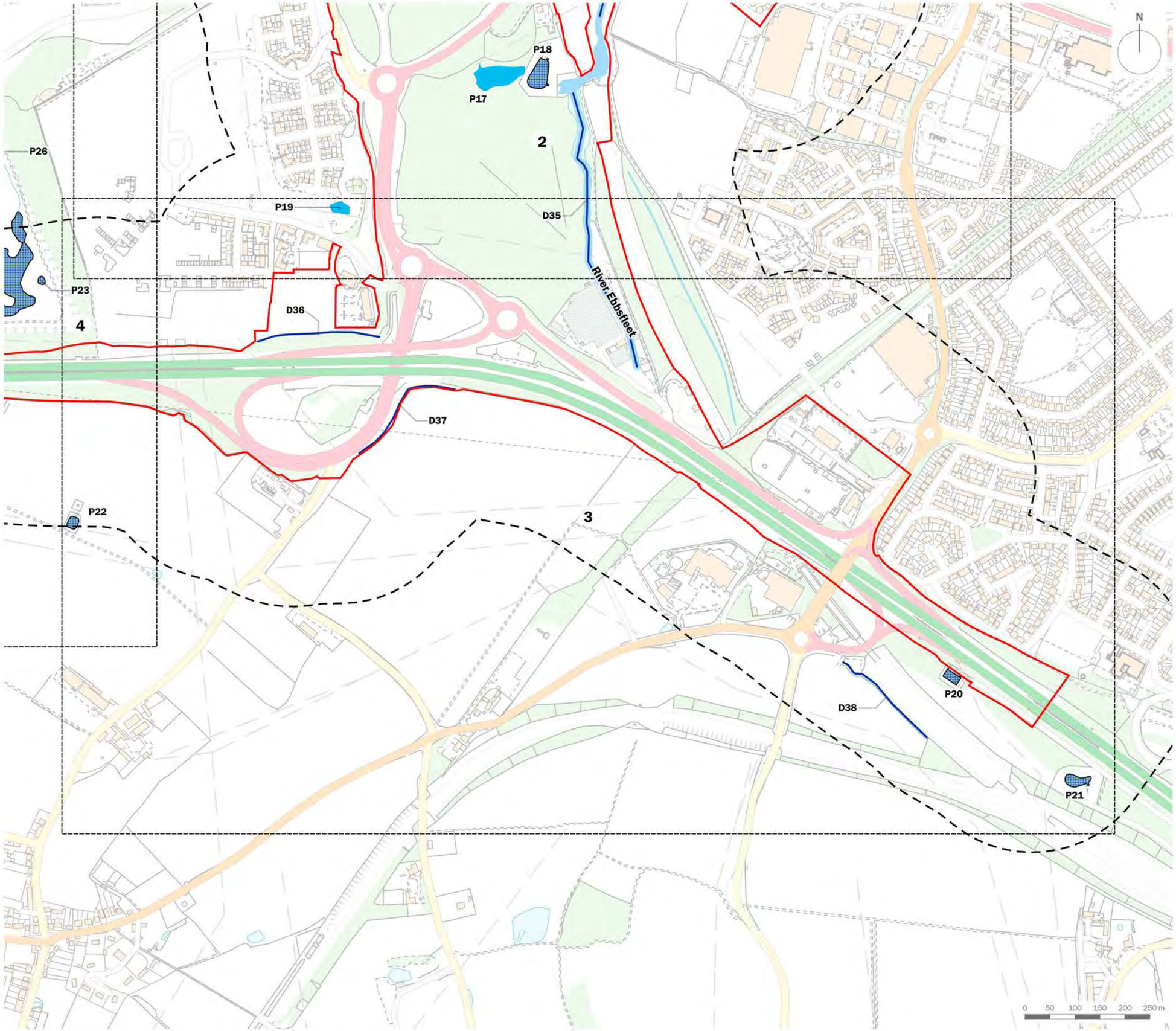


DCO Boundary

250m Buffer

Pond/Waterbody (Surveyed)

Pond/Waterbody (Not Surveyed)

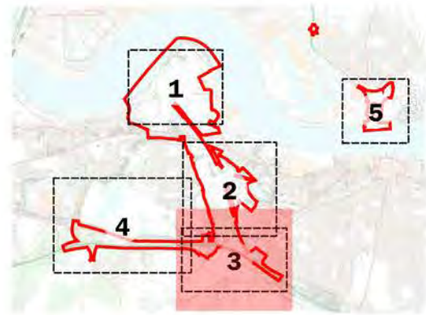
Ditch (Surveyed)

Ditch (Not Surveyed)

P1 Pond/Waterbody Numbers

D1 Ditch Numbers

Warty Newt/Great Crested Newt Record (KMBRC)



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project title

The London Resort

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Plan EDP 19: GCN Survey Schedule (Sheet 3 of 5)

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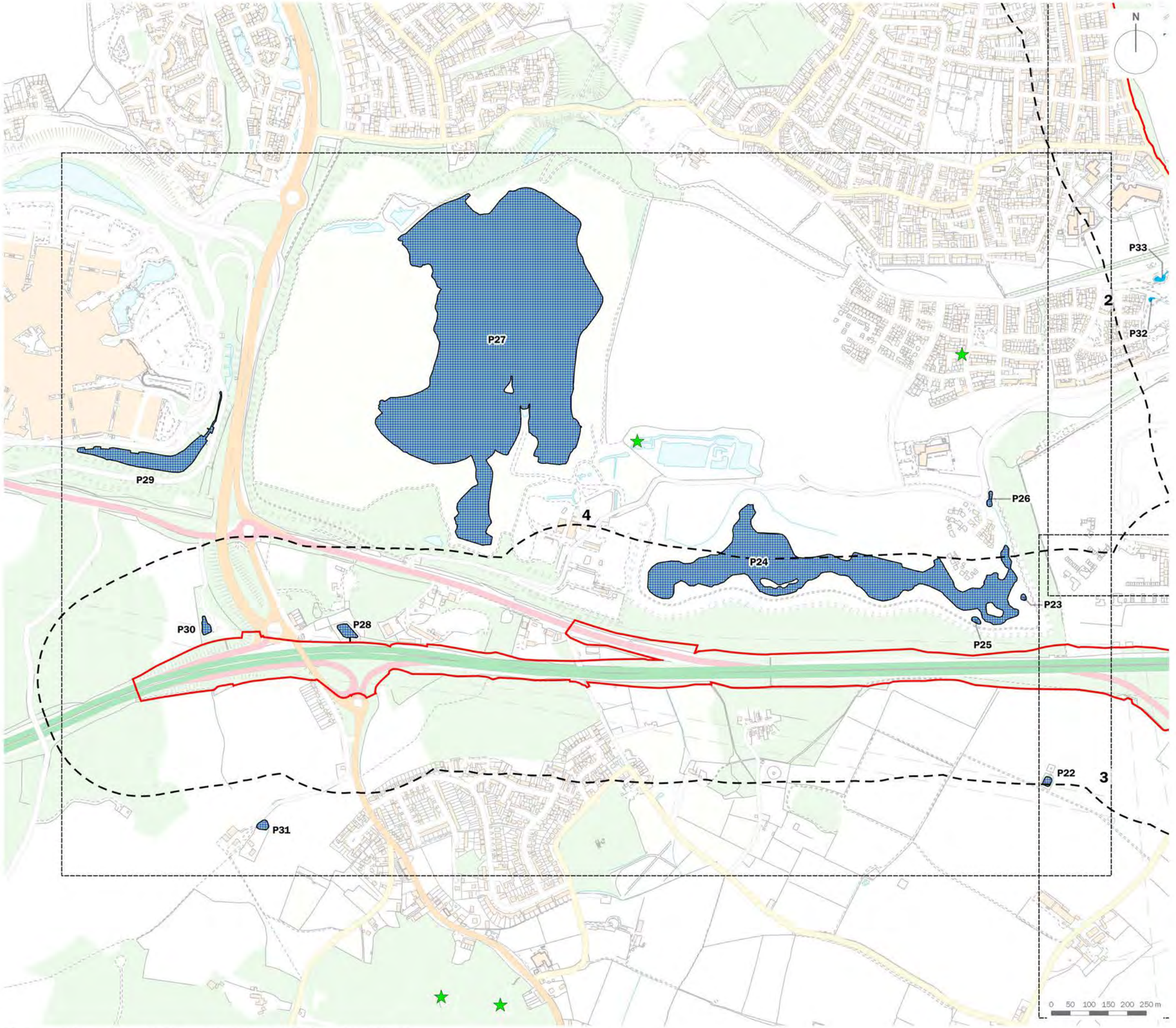


DCO Boundary

250m Buffer

Pond/Waterbody (Surveyed)

Pond/Waterbody (Not Surveyed)

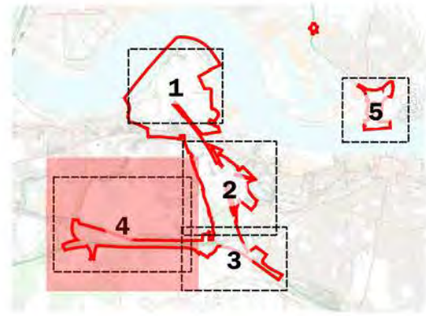
Ditch (Surveyed)

Ditch (Not Surveyed)

P1 Pond/Waterbody Numbers

D1 Ditch Numbers

Warty Newt/Great Crested Newt Record (KMBRC)



client

The London Resort Company Holdings Ltd

project title

The London Resort

drawing title

Plan EDP 19: GCN Survey Schedule (Sheet 4 of 5)

date	**23 JULY 2020**	drawn by	**PD**
drawing number	**edp5988_d063a**	checked	**JB**
scale	**Refer to scale bar @ A3**	QA	**RB**

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DCO Boundary

250m Buffer

Pond/Waterbody (Surveyed)

Pond/Waterbody (Not Surveyed)

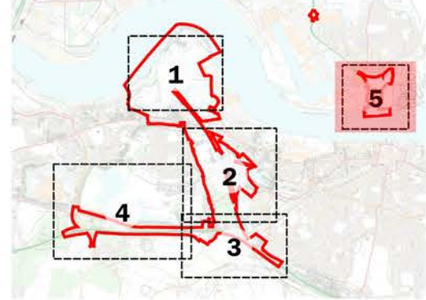
Ditch (Surveyed)

Ditch (Not Surveyed)

P1 Pond/Waterbody Numbers

D1 Ditch Numbers

Warty Newt/Great Crested Newt Record (KMBRC)



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Plan EDP 19: GCN Survey Schedule (Sheet 5 of 5)

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Annex EDP 4
Illustrative Photographs - Swanscombe Marshes

Photo EDP 1: P6

Photo EDP 2: D17

Photo EDP 3: P5

Photo EDP 4: D13

Photo EDP 5: D23

Photo EDP 6: D29

creating a better place

Environment Agency

Mr Karl Cradick
Savills (L and P) Ltd
Wessex House Priors Walk
WIMBORNE
Dorset
BH21 1PB

Our ref: KT/2020/127432/01-L01
Your ref: Environment Agency

Date: 15 September 2020

Ecology Briefing Note: Further Information in Respect of an EIA Scoping Opinion edp5988_r019

London Resort

Thank you for consulting us on the Ecological Briefing Note related to fish surveys. PINS have not agreed to scope out fish from the future Environmental Statement and EDP have sought clarification that scoping out of fish from the Environmental Statement (ES) is acceptable to the Environment Agency. We have commented in more detail below:

Thames Tideway

With respect to the Thames Estuary fish communities, it would not be appropriate to scope these out given there are a number of activities and new structures that will directly impact upon the tidal Thames and fish will be sensitive to the impacts of these. The Ecology Briefing Note correctly identifies this and the need to characterise the assemblages and habitat utilisation of fish species in the development area.

Additional fish survey work has been undertaken to achieve this and additional fisheries data are also available from the EA in order to identify the likely sensitive fish species. Migratory fish should also be considered within the scope of the future ES and in this location we would expect possible impacts upon Atlantic salmon, sea trout, European eel, Twaite and Allis shad, smelt and lamprey. These species should be considered in the ES. Especially with regard to construction activities such as percussive piling and dredging, which, if unmitigated, have the potential to inhibit or block migratory movements or displace fish. Additionally, there will be marine species such as juvenile sea bass, herring, sprats and dover sole using the tidal river in the vicinity of the development, so they should also be considered as sensitive receptor species.

Within the ES the impacts of the proposed Combined Heat and Power plant upon the fish community should also be specifically addressed. Specifically the impact of the associated warm water discharge and the requirement for eel screens at the abstraction point and how this relates to resident and migratory fish species.
There is a stated aspiration for Best Practice screening, which will mitigate most of the fisheries issues associated with the abstraction point, but this does need to be

described in terms of potential for impact and how the screens mitigate negative impacts upon fish.

River Ebbsfleet

The river is heavily modified and the available habitat is fragmented. The 2015 fish survey found only a limited coarse fish population with no evidence of natural recruitment. Poor quality habitat and water quality, coupled with the isolation of the watercourse from the tidal Thames means that natural colonisation by fish is very low or impossible.

We would agree that the 2015 survey accurately characterises the likely fish communities present and that additional freshwater fish surveys are not likely to be necessary. Therefore in terms of additional survey work scoping fish out of the future ES does make sense.

However, the future fisheries potential of the Ebbsfleet should not be dismissed and its current poor status should not be taken as justification for increasing negative pressure upon it.

The principle of no deterioration would still apply and we would suggest that there could be significant ecological improvement opportunities for this watercourse, requiring only modest interventions. The SC^2 report supports this and states '*The fish community encountered at the road junction sites suggest that river channel restoration projects could lead to significant improvement in the fish holding capacity of other reaches of the watercourse*' and '*Future restoration processes could lead to significant improvements in riverine fish communities and restoration of the migration of species such as eel.*'

We would agree that there is future potential for improving the in-stream and bankside habitat, plus possible reconnection with the Thames (for eel migration), and re-establishing a representative riverine fish community. These are options that we would want to consider and to ensure that no development activities take place that would preclude such improvements in the future.

Such ecological gains along the Ebbsfleet river corridor may well assist the developer in offsetting negative impacts elsewhere on site. We would welcome the opportunity to discuss this in further detail.

Within the future ES, whilst we acknowledge that the current fish populations are impoverished and future survey effort is not required, we would advise that the ES does incorporate an assessment of any potential impacts of the development upon the Ebbsfleet with regard to future improvement of the watercourse and establishing a riverine fish community. Consideration should be given to any proposals that would lead to increased fragmentation of habitats along the river corridor (eg. New Culverts or river crossings), any barriers to future free passage of fish and any habitat creation or modification's should take fish into account.

Additionally, construction activities that would impact upon the Ebbsfleet and other waterbodies, should give some consideration to the possible presence of fish. Specifically, any dewatering of waterbodies, especially those not surveyed, could reveal eels to be present. If fish are found to be present then fish rescues and relocations of fish may be required. These will require prior authorisation by the EA if nets or electrofishing equipment is use, or fish are to be moved from one waterbody to another.

Waterbodies across Swanscombe Marshes

Whilst the 2015 fish survey of Swanscombe Marshes by SC^2 failed to capture any fish, it did state in its conclusion that '*greater maturity and stability might well see the marsh support a significant head of fish in the future.*' We would concur with the view, as similar habitats elsewhere along the Thames have significant fish communities. It is likely that the isolated nature of the waterbodies has either prevented colonisation, or that poor water quality, or unstable water levels have led to resident fish dying off.

We would advise that there still exists the potential for fish to be present, particularly eels, so as we have stated above, any significant changes or modifications to these habitats may reveal their presence. If fish are found to be present at a later stage in the development then any negative impact will need to be assessed. This should be stated within the ES, even if the impact is not deemed significant.

Again, we would see these waterbodies as areas within the development where significant ecological improvements could be made, and if fish communities were appropriate and wouldn't adversely affect other ecological features, we would strongly support their establishment.

Do not hesitate to contact me if you require further details.
Kind regards,

Mrs Karolina Allu
Planning Specialist

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