EASTERLY ALTERNATION INFRASTRUCTURE PROJECT

Environmental Impact Assessment
Environmental Statement, Volume III
Appendix 12.1: Report to Inform the Appropriate Assessment

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1 Introduction

1.1 Overview of the Proposed Development

1.1.1 Heathrow Airport Limited (referred to as "Heathrow") is seeking planning permission for development of infrastructure that will facilitate full runway alternation when Heathrow Airport ("the Airport") is operating in an easterly direction ("the Proposed Development"). This will mean departures and arrivals in an easterly direction can alternate between the Northern and Southern runways, as they currently do on westerly operations. Runway alternation in an easterly direction has not occurred at the Airport routinely because it was prevented by a historic agreement known as the Cranford Agreement. The Cranford Agreement was ended by the Government in January 2009, and the Proposed Development will provide the infrastructure required to enable full alternation of the runways during easterly operations. Further information on the Proposed Development is set out in **Section 2**.

1.1.2 Full runway alternation will more fairly and equitably share the noise impacts of operation at Heathrow amongst Heathrow's communities, enabling all communities to achieve periods of respite.

1.1.3 This Report to Inform the Appropriate Assessment (RIAA) has been prepared on behalf of Heathrow ("the Applicant") by Logika Group (hereafter referred to as Logika). This report has been submitted along with the Environmental Impact Assessment (EIA) that has been prepared by Logika and WSP UK Ltd.

1.2 Purpose of the Report to Inform the Appropriate Assessment

1.2.1 This RIAA has been produced for the purpose of providing the Competent Authority (the London Borough of Hillingdon (LBH)) with the information necessary to enable compliance with duties under Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended) (the "Habitats Regulations"). This RIAA relates to the Proposed Development and provides:

1) A summary of the results of the HRA Screening Report (**Appendix 12.2: HRA Screening Report, Volume III** of the Environmental Statement) that was published alongside the Scoping Report (**Appendix 1.5: Scoping Report, Volume III** of the Environmental Statement) identifying Likely Significant Effects (LSE) on European sites associated with the Proposed Development;

2) a list of European sites (and their designated features) that may be subject to LSE due to the Proposed Development, either alone or in combination with other plans or projects; and

3) an assessment of the potential for adverse effects on the integrity (AEOI) of those European sites for which LSE have been identified.

1.3 Structure of this Report to Inform the Appropriate Assessment

1.3.1 The remainder of this RIAA is structured as follows:

- **Section 2** provides a description of the Proposed Development;
- **Section 3** provides an overview of the Habitats Regulations Assessment;
- **Section 4** provides a summary of the HRA Screening Assessment;
- **Section 5** provides an assessment of AEOI associated with the Proposed Development;
- **Section 6** provided a summary of this report; and
- **Section 7** provides a list of references.

1.3.2 This report is also supported by three annexes:

- **Annex A** Heathrow Biodiversity Birds Disturbance Report – March 2019;
- **Annex B** European site designations; and
- **Annex C** Figures.

2 The Proposed Development

2.1 Description of the Proposed Development

2.1.1 The extent of the new airfield infrastructure works is relatively limited. The Applicant is seeking planning permission for the construction of the following components:

- Taxiways and links to comprise a Runway Hold Area at the western end of Runway 09L. This includes:
    - Two new Runway Access Taxiways (RATs) onto Runway 09L;
    - Link 57 realigned and re-provided as a Code F Taxiway with a tie into the existing Taxiway Alpha North, east of Link 58;
    - Link 56 realigned and provided as a Code E Taxiway with a tie into the existing Taxiway Bravo North, east of Link 58;
    - A new Code C Taxilane to serve the stands north of T5a extending to the existing Taxiway Bravo;
    - A new north-south link connecting the realigned Link 56, Link 57 and Code C Taxilane; and
    - Construction of underground services to serve the new infrastructure.
- To construct a noise barrier to the south of the village of Longford;
- Removal of redundant areas of airfield pavement and reinstatement to grass areas on the Northern runway to accommodate the construction of the new taxiway infrastructure listed above;
- Re-grading of airfield grass areas to accommodate the construction of the new taxiway infrastructure listed above; and
- To break out existing areas of redundant pavement (on the existing airfield).

Site location

2.1.2 Heathrow Airport is located approximately 15 miles west of Central London and lies within the administrative boundary of LBH. The Airport also borders the London Borough of Hounslow and Borough of Spelthorne. The Airport is situated on approximately 1,227 hectares (ha) of land and operates two parallel runways (Northern Runway 09L/27R and Southern Runway 09R/27L) with four operational terminals (Terminal 2 (T2), Terminal 3 (T3), Terminal 4 (T4), and Terminal 5).

2.1.3 Please refer to **Figure 2.1** and **Figure 2.2** in **Appendix 2.2: Heathrow Airport and its Surrounds Figures, Volume II** of the Environmental Statement for the location of the Proposed Development in relation to the wider context of the Airport and the surroundings.

Surroundings

2.1.4 The Airport is broadly bounded to the north by the A4, to the west by the A3044, to the east by the A30 and to the south by the Duke of Northumberland's River and Longford River, as well as smaller connecting roads. Approximately 600m from the western perimeter of Heathrow lies the M25, with a direct link to T5 and the perimeter road from Junction 14a. The M4 provides an additional direct link to the Airport's central terminal area and the perimeter road from Junction 4 via a 'spur'.

2.1.5 The Airport sits in two main river catchments, namely the catchment of the River Colne in the west and of the River Crane to the east. It is bounded by a number of associated watercourses west of the Airport – these include the River Colne, the Colne Brook and the Wraysbury River. In addition, the Duke of Northumberland's River and the Longford River flow around the Airport's western and southern boundaries. To the west and south of the Airport are a series of drinking water reservoirs supplying London, namely the Queen Mother, Wraysbury, King George VI and Staines Reservoirs.

2.1.6 The Airport lies within a semi-urban area with several settlements bordering the perimeter. Longford, Harmondsworth, Harlington and Sipson villages lie to the north, Poyle and Colnbrook to the west, while Stanwell Moor, Stanwell, Hatton and East Bedfont lie to the south[1] (see **Figure 2.1** in **Appendix 2.2**). Cranford and Hounslow are situated to the east. Despite the largely urban nature of its immediate surrounds, to the north-west, south-west and west, the Airport surroundings become much less developed and are more rural in nature.

2.1.7 The topography of the Airport and surrounding areas is one that is relatively flat ranging from around 19m in elevation to the west, to 26m in the east.

Existing Infrastructure

2.1.8 The land on the Airport is largely comprised of hardstanding in the form of runways, terminal buildings, taxiways, aprons, and auxiliary buildings, as well as 'airfield' grassland that is heavily managed to avoid attracting birds and other wildlife. Further details on this infrastructure are set out below:

Runways:

- Heathrow has two runways: the Northern runway (09L/27R) being 3,902m long and the Southern runway (09R/27L) being 3,660m long. Both are oriented east to west.

Terminals:

- Heathrow operates four terminals, referred to as T2, T3, T4 and T5, where passengers arrive at and depart from the Airport. Terminal 1 is no longer in use for passenger and aircraft operations. Specifically, T2 and T3 form a cluster of terminal buildings known as the Central Terminal Area (CTA), which is situated in the central part of the Airport between the Northern and Southern runways. T5 is in the west of the Airport, with T4 being found in the southeast.

[1] London Development Database, (n.d). *Map View*. [Online] Available at: https://maps.london.gov.uk/map/?ldd[(Accessed: 12 June 2024].

Taxiways:

- Heathrow has a taxiway network to circulate aircraft between the terminals and the runways under the guidance of air traffic control. The taxiway network comprises four parallel taxiways (two serving each of the runways), which are linked by cross field taxiways. There are also taxiways south of the Southern runway, including one parallel taxiway, connecting T4 and the cargo area to the rest of the Airport. Runway links, including exit taxiways and Runway Access Taxiways (RATs), connect the parallel taxiways to the runways and are used by aircraft entering and exiting the runways. More minor taxiway links and cul-de-sac taxi lanes connect all the taxiways to the aircraft stands.

Aprons:

- Aprons are a designated space on an airfield for the parking of aircraft, refuelling, and the loading and unloading of passengers and freight. Each terminal building at Heathrow has its own aprons. Additionally, there is a cargo apron in the south of the Airport for designated freight aircraft and maintenance aprons in the east of the Airport.
- The aprons provide parking space for a wide range of passenger and cargo aircraft, from the smaller turboprop ATR72 or Boeing 737 up to large aircraft such as the Airbus A380 or Boeing 747.

Ancillary facilities:

- Ancillary facilities support the operation and maintenance of the Airport. They include maintenance and repair facilities, warehousing and cargo storage facilities and other airport operational land (such as surface water pollution control, balancing ponds, construction compounds for ongoing work, in–flight catering facilities, air traffic control, baggage and parking for service equipment. These are located throughout the Airport.

3 Habitats Regulations Assessment

3.1.1 Council Directive 92/43/EEC on the conservation of wild fauna and flora (known as the Habitats Directive) was transposed into UK legislation through the Conservation of Habitats and Species Regulations 2017 (as amended). These regulations provide a framework for the protection of European sites.

3.1.2 The Habitats Regulations define the approach for the assessment of the implications for European sites of the implementation of plans and projects. This process is known as Habitats Regulations Assessment (HRA). There are a number of guidance documents provided by the UK Government that describe the process. The most relevant are:

- Habitats regulations assessment: protecting a European site (2021)[2].
- Planning Practice Guidance, Appropriate assessment – Guidance on the use of Habitats Regulations Assessment (2019)[3].

3.1.3 In determining whether or not a plan or project can be adopted or consented, the competent authority must comply with *Regulation 63* of the Habitat Regulations as partly set out below:

"63(1) A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for a plan or project which:

(a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans and projects); and

(b) is not directly connected with or necessary to the management of that site,

must make an appropriate assessment of the implications for that site in view of that site's conservation objectives."

"(2) A person applying for any such consent, permission or other authorisation must provide such information as the competent authority may reasonably require for the purposes of the assessment or to enable it to determine whether and appropriate assessment is required."

"(5) In the light of the conclusions of the assessment, and subject to regulation 64, the competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site or the European offshore marine site (as the case may be)."

3.1.4 Should a negative effect on the integrity of a European site be identified under Regulation 63, further consideration is required with regard to *Regulation 64 and Regulation 68*.

"64(1) If the competent authority is satisfied that, there being no alternative solutions, the plan or project must be carried out for imperative reasons of overriding public interest (which, subject to paragraph (2), may be of a social or economic nature), it may agree to

[2] Gov.uk., (2021, updated 2023), 'Habitats regulations assessments: protecting a European site' (online), Available at: https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site [Accessed: 18 October 2024].
[3] Gov.uk., (2019) 'Appropriate assessment' (online) Available at: https://www.gov.uk/guidance/appropriate-assessment [Accessed: 18 October 2024].

the plan or project notwithstanding a negative assessment of the implications for the European site or the European offshore marine site (as the case may be)."

"68 Where in accordance with regulation 64 –

(a) a plan or project is agreed to, notwithstanding a negative assessment of the implications for a European site or a European offshore marine site, or

(b) a decision, or a consent, permission or other authorisation, is affirmed on review, notwithstanding such an assessment,

the appropriate authority must secure that any necessary compensatory measures are taken to ensure that the overall coherence of Natura 2000[4] is protected."

3.1.5 In order to undertake an assessment that accords with legislation, a staged process has developed over time that has been shaped by guidance and case law. This case law is derived from both the UK courts and the Court of Justice of the European Union (CJEU)[5].

3.1.6 There are three recognised stages of the HRA process. These are:

- Stage 1 – Screening. This stage identifies LSE that cannot be ruled out due to the implementation of a plan or project alone or in-combination with other plans and projects. If LSE are identified assessment at Stage 2 is required; where no LSE are identified Stage 2 is not necessary.
- Stage 2 – Appropriate assessment. This stage focuses on establishing, beyond reasonable scientific doubt, whether any of the LSE may negatively affect the integrity of a European site in light of its conservation objectives.
- Stage 3 – Derogation. This stage includes three tests: assessment of alternative solutions; consideration of Imperative Reasons of Overriding Public Importance (IROPI) and securing of compensatory measures. Where a negative effect on site integrity is concluded, it is necessary to determine whether there are alternatives to the proposed plan or project that would avoid or lessen the effects on a European site(s); whether there is a need for the plan or project with respect to the type and scale of the public benefit and whether sufficient compensatory measures can be secured to ensure the integrity of the National Site Network.

3.1.7 This report covers Stage 2 (appropriate assessment) only. It is a RIAA as it is the Competent Authority's legal duty to complete the appropriate assessment. This report provides the necessary information for LBH, in consultation with Natural England, to conclude an appropriate assessment.

[4] Following the Conservation of Habitats and Species (Amendments) (EU Exit) Regulations 2019, the term 'Natura 2000 network', is replaced by the 'National site network'.

[5] Following Brexit, The Supreme Court and the Court of Appeal are not bound by retained EU case law and can depart from it. However, these Courts will generally continue to follow retained EU case law and will only depart from it where satisfied that it appears right to do so. The lower courts remain bound to determine any questions as to the meaning, validity, or effect of the Habitats Regulations in accordance with retained EU case law (unless it is changed by Parliament or the Supreme Court or the Court of Appeal departs from it).

4 HRA Screening Summary

4.1 Summary of screening results

4.1.1 The HRA Screening Report (**Appendix 12.2**) was submitted alongside the Scoping Report (**Appendix 1.5**) and identified eight European sites for which LSE have been identified. The Scoping Opinion from LBH (**Appendix 1.6**) identified in paragraph 13.2 the need to consider international and national level receptors due to the change in flightpaths but noted in paragraph 13.1 that the approach to the biodiversity assessment in general was acceptable. Natural England did not provide comments on the HRA Screening Report or the associated EIA Scoping Report.

4.1.2 The eight European sites for which LSE were concluded are:

- South West London Waterbodies Special Protection Area (SPA);
- South West London Waterbodies Ramsar site;
- Windsor Forest and Great Park Special Area of Conservation (SAC);
- Richmond Park SAC;
- Wimbledon Common SAC;
- Burnham Beeches SAC;
- Thursley, Ash, Pirbright and Chobham SAC; and
- Thames Basin Heaths SPA.

4.1.3 The potential for local increases in the atmospheric concentration and deposition of nitrogen due to changes in frequency of flights over specific geographical areas was identified as a potential LSE at all European sites listed. No other LSE were identified for any European sites other than for the South West London Waterbodies SPA and Ramsar site. For these European sites (sharing a common boundary) the disturbance of birds due to change in the pattern of aircraft movements resulting in a reduction in the fitness of individual birds has also been identified as an LSE.

5 Information to Inform the Appropriate Assessment

5.1 Increases in atmospheric concentration and deposition of nitrogen

5.1.1 The changes in oxides of nitrogen (NOx) are quantified in **Chapter 6: Air Quality, Volume II** of the Environmental Statement. The results of air quality modelling show a worst-case increase in NOx production of 1.6 tonnes per annum, which is an increase of less than 0.1%. This increase comes from changes to how aircraft will taxi when on the airfield restricting the majority of change to concentrations and rates of deposition to within the airport boundary. The greatest changes to concentrations of NOx outside of the airfield occur close to the western end of the Northern runway. The increases in NOx in this area do not extend over any European sites or associated functionally linked land. The only European site within an area where the air quality modelling predicts any change from current baseline is the South West London Waterbodies SPA and Ramsar site. At this European site, and in its surrounds the critical level[6] for NOx of 30µg/m^3 is not exceeded in any modelled scenario and therefore, no effect on the habitat supporting Gadwall (*Anas strepera*) and Shoveler (*Anas clypeata*)[7] of the South West London Waterbodies SPA and Ramsar site is predicted due to an increase in the concentration of NOx.

5.1.2 Nitrogen deposition is predicted to remain relatively static compared to the baseline with changes ranging from an increase of 0.01kg/ha/yr to a decrease of 0.05kg/ha/yr dependent on the location within the South West London Waterbodies SPA and Ramsar site. The South West London Waterbodies SPA and Ramsar site has not been attributed a critical load[8] on the Air Pollution Information System (APIS)[9] but using a minimum critical load of 10kg/ha/yr the worst case increase would represent 0.1% of the critical load. It is notable that the South West London Waterbodies SPA Site Improvement Plan[10] (Natural England, 2014) does not identify nitrogen deposition as a pressure or threat.

5.1.3 This European site comprises mainly of eutrophic open water, much of which is pumped from the River Thames and is being used (as drinking water for London) and then replaced regularly (i.e. within the reservoirs). This ensures that the addition of very small additional levels of nitrogen (and reductions in nitrogen deposition in other locations within the designation) will not result in any detectable changes on water chemistry both due to the large dilution effect, and the movement of water through the drinking water system.

5.1.4 At the closest area of functionally linked land[11] that is not a drinking water reservoir (Colne Mere, which is part of the Wraysbury and Hythe End Gravel Pits Site of Special Scientific

[6] Critical levels are concentrations of pollutants in the atmosphere above which direct adverse effects on receptors, including habitats, may occur based on current knowledge.
[7] Gadwall and shoveler are types of duck
[8] Critical loads are an estimate of exposure of one or more pollutants below which significant harmful effects on habitats do not occur according to present knowledge.
[9] Air Pollution Information System is online at Air Pollution Information System | Air Pollution Information System (apis.ac.uk) [accessed March 2024]
[10] Natural England, (2014). *South West London Waterbodies SPA Site Improvement Plan*. [Online] Available at: https://publications.naturalengland.org.uk/publication/6662064386867200 [Accessed 09 September 2024].
[11] *land or sea occurring outside a designated site which is considered critical to, or necessary for, the ecological or behavioural functions in a relevant season of a qualifying feature for which a Special Area of Conservation (SAC)/Special Protection Area (SPA)/Ramsar site has been designated. These habitats are frequently used by SPA species and supports the functionality and integrity of the designated sites for these features*.

Interest (SSSI)) the increase in nitrogen deposition is predicted to be 0.004kg/ha/yr which represents less than 0.1% of its minimum critical load. These flooded gravel pits are adjacent to the M25 and are also eutrophic and therefore unlikely to be affected by a small increase in nitrogen deposition.

5.1.5 The location and nature of the habitats supporting gadwall and shoveler will not be detectably changed based on the level of additional nitrogen deposition (or the reduction of nitrogen deposition in some parts of the SPA / Ramsar site) predicted. The modelled year for changes to air quality is 2028, over time the annual emissions of nitrogen oxides have been reducing, with this trend predicted to continue as transport (particularly road traffic) decarbonises. Therefore, the small increases predicted due to the Project also take place against a background of reducing levels of nitrogen deposition that have occurred over the past three decades.

5.1.6 No adverse effects on the integrity of any European site due to increases in the concentration or deposition of nitrogen due to the Proposed Development alone are concluded. There is potential for road traffic growth associated with a wide variety of development types including delivery of new residential dwellings and commercial spaces. This traffic could use roads that are within 200m of the boundary of the South West London Waterbodies SPA / Ramsar site and therefore contribute to increased concentrations and deposition of nitrogen. However, the air quality changes predicted are based on transport assumptions that include for traffic growth, and therefore, it is already intrinsically included within the assessment.

5.2 Disturbance of birds using the South West London Waterbodies

5.2.1 Gadwall and shoveler wintering on the South West London Waterbodies SPA and Ramsar site could be disturbed by the overflight of aircraft due both to the noise created and the visual presence of aircraft (including shadow cast). A literature review undertaken and appended to the HRA Screening Report (**Appendix 12.2**: **HRA Screening Report**) concluded that birds are typically tolerant of aircraft overflight when a plane is above 2,000ft (610m).

5.2.2 The South West London Waterbodies SPA and Ramsar site is approximately 0.7km due south-west and west of the airport perimeter. In this location Wraysbury Reservoir is the closest waterbody within the designation boundary, with Wraysbury I (north and south) and Wraysbury II (north and south) also directly overflown (see **Figure 5.1**). The Staines Reservoirs (north and south) and King George VI Reservoir are not regularly overflown due to their position, but they do lie close enough to typical flight paths to be exposed to both the aural and visual stimuli associated with aircraft. Other waterbodies within the designation boundary (namely St Anne's Lake, Beesborough Reservoir, Kempton Park East Reservoir and Red House Reservoir) are at too great a distance and in geographic locations where any overflight takes place well above 2,000ft.

5.2.3 The South West London Waterbodies SPA and Ramsar site is also supported by a range of flooded gravel pits and drinking water reservoirs that make up functionally linked land. These include locations that are currently overflown such as Horton Lake and Colne Mere (see **Figure 5.1**). For the purposes of this assessment it is assumed that all lakes lying between Brands Hill and Hythe End could be supporting gadwall and shoveler from the SPA and Ramsar site.

5.2.4 Behavioural responses to aircraft overflight and over potential disturbance agents (PDA) have been monitored on a range of waterbodies both within and functionally linked to the South West London Waterbodies SPA and Ramsar site (see **Annex A**). These surveys took place in the winters of 2016/17, 2018/19 and 2023/24. **Table 5.1** summarises the findings for each year.

Table 5.1 Results of survey recording responses to potential disturbance agents

Winter period	No. of behavioural responses recorded overall (Gadwall / Shoveler)	No. of behavioural responses due to overflight overall (Gadwall / Shoveler)	No. of overflights recorded
2016/2017	265 (90, 10)	31 (1, 1)	3,385
2018/2019	196 (36, 14)	52 (9, 1)	5,855
2023/2024	583 (95, 50)	41 (5, 5)	10,435
Total	1,044 (221, 74)	124 (15, 7)	19,675

5.2.5 The 124 disturbances by aircraft, represent disturbance events occurring for 0.63% of overflights. Of the disturbance events recorded the majority were not resulting in disturbance of the designated features (gadwall and shoveler), with tufted duck being most prone to disturbance. In general, most disturbance was caused by pedestrians, dog walkers and joggers with much of this focused on the Staines Reservoirs due to public access being available across a footpath that separates the north and south reservoirs. The full results and analysis of the bird disturbance surveys can be found in **Annex A**.

5.2.6 The Proposed Development would see an increase in the number of flights landing on the Southern runway. These flights at the lowest (when over the Wraysbury Reservoir) will be at an altitude between 600 and 1,000ft. With the implementation of full runway alternation when the airport is on easterly operations, aircraft will depart from Runway 09L for 50% of the time (equivalent to 14.5% of the total time the airport is operating i.e. half of 29%) and depart from Runway 09R for 50% of the time (again equivalent to 14.5% of the total time the airport is operating). This will equate to approximately 328 departures from Runway 09L and approximately 328 departures from Runway 09R on a typical day when the airport is on easterly operations. This flight profile already occurs, with the Proposed Development resulting in an additional 300 flights per day landing on the Southern runway, with a reduction of this number landing on the Northern runway. When on westerly operations (which occurs approximately 70 to 80% of the time) flights taking off from the Northern and Southern runways are equal. Although it is also noted that the Proposed Development would not alter the number of flights from the Southern runway that take off over the South West London Waterbodies SPA and Ramsar site (most notably across the Wraysbury Reservoir).

5.2.7 As described in the noise assessment presented in **Chapter 7: Noise and Vibration, Volume II** of the Environmental Statement, landing aircraft tend to produce lower levels of noise than those taking off due to how the engines are operated during these procedures. It is also notable that when arriving aircraft are approaching in a straight line, as opposed to

banking towards their allotted flight path soon after take-off. Therefore, each additional plane landing on the Southern runway will be less disruptive than others that regularly take off over the South West London Waterbodies SPA and Ramsar site. The gadwall and shoveler present already display high levels of tolerance to aircraft overflight with considerably less than 1% of current flights resulting in a disturbance of these birds, and therefore the addition of a relatively small number of flights is unlikely to result in further levels of disturbance. The additional aircraft would not be expected to increase the level of disturbance events markedly across the South West London Waterbodies SPA and Ramsar site as tolerance is already built up and the type of flight activity (lower noise and predictable course) is largely not that which causes disturbance events (large aircraft making less predictable movements – see **Annex A**).

5.2.8 No adverse effects on the integrity of the South West London Waterbodies SPA and Ramsar site alone is therefore concluded due to disturbance caused by aircraft overflight.

5.2.9 Other plans and projects could increase the level of disturbance should additional PDA result from them. In many cases, the South West London Waterbodies SPA and Ramsar site is not sensitive to these changes as much of the area is not publicly accessible. For example, Wraysbury Reservoir and the majority of Staines Reservoirs are restricted to Thames Water staff, whilst other areas have few public rights of way and are restricted to private members (e.g. sailing clubs) or are actively worked by the minerals industry (e.g. Kingsmead Quarry). Further, there is limited opportunity to park in this area if visiting from further afield, thereby naturally limiting growth in recreational disturbance. Therefore, an in-combination effect of disturbance is not predicted.

6 Summary

6.1.1 Likely significant effects were identified for eight European site during the HRA screening process. These were:

- South West London Waterbodies SPA;
- South West London Waterbodies Ramsar site;
- Windsor Forest and Great Park SAC;
- Richmond Park SAC;
- Wimbledon Common SAC;
- Burnham Beeches SAC;
- Thursley, Ash, Pirbright and Chobham SAC; and
- Thames Basin Heaths SPA.

6.1.2 Likely significant effects due to changes in air quality were identified for all of the listed European sites. However, detailed air quality modelling (**Chapter 6: Air Quality, Volume II** of the Environmental Statement) undertaken has demonstrated that detectable changes to the baseline year are only predicted at the South West London Waterbodies SPA and Ramsar site. This is also the only European site where a likely significant effect of disturbance of designated features due to aircraft overflight was predicted at the screening stage.

6.1.3 The detectable change to air quality predicted for parts of the South West London Waterbodies SPA and Ramsar site is small (less than 0.2%) to habitats that are already eutrophic and in close proximity to the M25 motorway. No change to the ability of these waterbodies to support over-wintering gadwall and shoveler is predicted and therefore no adverse effect on the integrity of the South West London Waterbodies SPA and Ramsar site is predicted due to changes in levels of nitrogen concentrations or deposition.

6.1.4 Increases in the number of overflights of the South West London Waterbodies SPA and Ramsar site could result in additional levels of disturbance to the designated features when using the designated area or wider functionally linked land. However, field survey data recording behavioural responses of gadwall and shoveler (and other wildfowl) to aircraft overflight across three winter periods demonstrates that the birds present are tolerant of this potential disturbance agent. Based on the field survey results it is reasonable to conclude that additional flights, especially aircraft on predictable arrivals flight paths, will not result in additional disturbance that would lead to a loss of condition in individual birds, thereby reducing the fitness of the designated population. Therefore, no adverse effect on the integrity of the South West London Waterbodies SPA and Ramsar site is predicted due to changes in overflight numbers and pattern.

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ANNEX A - Heathrow Biodiversity Birds Disturbance Report – March 2019

Heathrow

EASTERLY ALTERNATION INFRASTRUCTURE PROJECT

Environmental Impact Assessment
Environmental Statement, Annex A Heathrow Biodiversity Birds Disturbance Report – March 2019

October 2024

Heathrow

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1. Introduction

1.1 Purpose of this report

1.1.1 WSP UK Limited (formerly Wood Environment & Infrastructure UK Limited) has been commissioned by Heathrow Airport Limited (Heathrow) to undertake disturbance monitoring of waterbirds at a complex of waterbodies located within and on the fringe of south-west London. This report details the results of survey work carried out during the winters of 2016/17 and 2017/18. These results will be used to support an Environmental Impact Assessment (EIA) and a Habitats Regulations Assessment (HRA) for the proposed airport expansion.

1.1.2 A list of all bird species mentioned in this report (with their English and scientific names and their British Trust for Ornithology (BTO) species codes) is provided in **Appendix B**.

1.2 Background

1.2.1 The Airports National Policy Statement (ANPS) HRA (WSP 2018) has identified a number of likely significant effects on the South West London Waterbodies Special Protection Area and Ramsar site (SWLW SPA/Ramsar) associated with the proposed development of a third runway at Heathrow.

1.2.2 This includes:

- Direct habitat loss/fragmentation;
- Disturbance (noise);
- Hydrological changes;
- Air quality changes; and
- Operation/management and mitigation.

1.2.3 The effects of disturbance are considered within the ANPS HRA document which has identified the following potential sources of disturbance:

- Construction – noise, vibration and visual disturbance;
- Operation – noise vibration and visual disturbance; and
- Recreation – increased use of waterbodies for water sports, fishing and other recreational uses.

1.2.4 Disturbance during construction has the potential to interrupt feeding or roosting behaviour of overwintering birds, leading to increased energy demands, as birds seek alternative locations for feeding or shelter, and therefore there is potential for them to suffer a degradation of condition and subsequently even reduced reproduction and survival rates.

1.2.5 Construction activities such as piling and the movement and operation of plant and operatives all have the potential to cause audible and visual disturbances. However, the

impact of construction on the SWLW SPA could be reduced by habituation of species to ongoing, repetitive works and the distances between working areas and key waterbodies.

1.2.6 It is acknowledged that the noise and movement of aircraft has the potential to disturb birds (Drewitt 1999). However, the ANPS HRA document acknowledges that there is no research or evidence to suggest that the current operational Levels at London Heathrow Airport (LHR) have a negative disturbance impact on the SWLW SPA and it has been assumed that the wintering bird populations have become tolerant and to some extent habituated to the levels of aircraft overflight.

1.2.7 It further states, however, that this is no guarantee that the proposed expansion and increase in levels of aircraft would be tolerated to the same degree, and therefore an LSE cannot be discounted.

1.2.8 Visual disturbance by humans undertaking recreational activities at waterbodies is recognised as one of the more significant sources of disturbances for wintering and breeding birds. The ANPS HRA document has identified a potential increase in recreational activities caused by an influx of additional workers to the area and the subsequent increase in passengers travelling from the airport.

1.2.9 To provide a robust evidence base that is suitable to support an EIA and HRA for the proposed development at the airport, information on how birds respond to aircraft disturbances is required. Further, information regarding other disturbances likely to be caused by construction, an increase in traffic, and recreational users within the SPA is required. This report provides the data of a bird disturbance study undertaken throughout the winters of 2016/17 and 2017/18.

1.3 Objectives

1.3.1 The objective of the bird disturbance study was to record the response of the target species to low flying aircraft associated with Heathrow, as well as the response of the target species to other human activities on or near the waterbodies that may cause disturbance.

2. Desk Study

2.1 Disturbance due to aircraft

2.1.1 A detailed review of existing literature has been completed to identify typical responses of waterbirds to aircraft, construction and recreational sources of disturbance and the impacts the associated impacts disturbance can have on wintering waterbirds.

2.1.2 A key reference when considering the impact of aircraft is the English Nature review, Disturbance effects of aircraft on birds (Drewitt 1999). This review compiles evidence from a wide range of sources and provides recommended buffers designed to avoid disturbance of waterbirds from aircraft.

2.1.3 In the review produced by English Nature into the effects of disturbance due to aircraft (Drewitt 1999), disturbance to birds is described as “any situation in which a bird behaves differently from its preferred behaviour”. The same review also describes bird disturbance as “any situation in which human activities cause a bird to behave differently from the behaviour it would exhibit without the presence of that activity”.

2.1.4 Responses to disturbance can range from slight changes of behaviour (such as becoming alert and observing the disturbance source) to more major responses, including taking flight and leaving a site for several hours or in some cases days (Drewitt 1999). Species and individuals that respond to disturbances by taking flight are typically expending greater levels of energy and also reducing the time they have available to feed and as such are increasing pressure on their individual energy budgets which has the potential to impact their survival and other functions such as breeding success (Burger 1981a, Zonfrillo 1992, Davidson and Rothwell 1993).

2.1.5 Aircraft flying low over waterbodies have been shown to illicit a disturbance reaction from waterbirds due to a combination of the aircraft’s large size (Ward et al. 1994) and high levels of noise (Ward et al. 1999). However, numerous studies (Owens 1977, Evans 1994, Rees et al. 2005) have shown that waterbirds are able to become habituated to the relatively constant and predictable aircraft activity associated with a busy airport.

2.1.6 Loud or low-flying aircraft are however, still able to disturb the birds as shown in studies by Ward et al. (1999) and Goudie & Jones (2004), highlighting that measures can be taken to reduce disturbance for the waterbirds. For example, by observing what the maximum disturbance altitude is for a species (or analogous species), a minimum flight altitude for overflights over wetlands can be calculated and enforced (Drewitt 1999). Research studying maximum lateral disturbance distances and noise thresholds can similarly be used to enforce limitations on overflights and noise levels to reduce risk of disturbance to waterbirds.

2.1.7 Research has shown that overflights below a certain altitude will cause disturbances. Some species are more susceptible to disturbances than others. For example, aircraft caused disturbances to birds within a range of altitudes from 150 metres (m) to waders on the Ribble estuary (Evans 1994) to 610m for brent geese in Alaska (Ward et al. 1994). Similarly, disturbance because of high noise levels is a factor in waterbird disturbance, with a study by Goudie and Jones (2004) showing that waterbirds regularly exposed to aircraft

overflights showed an intensification of alert responses when peak noise levels increased to over 80dB(A). However, a study conducted by Conomy et al. (1998) concluded that less than 3% of birds were adversely affected by flights with noise levels greater than 80dB(A). Existing recommendations state that flights over large concentrations of waterbirds should be at an altitude greater than 460m, and flight should be slow, as birds rarely collide with aircraft flying at 80 knots or less (Civil Aviation Authority 2012). Drewitt (1999) also states that curving, unpredictable flight lines are to be avoided as they cause greater disturbance than repeatedly straight overflights.

2.1.8 Other human activities can also cause disturbance to birds including: dog walking, fishing, cycling and the use of boats and other vessels on water bodies. Further discussion as to the types of (non-aircraft) disturbance source and their effects on birds is provided below.

2.2 Disturbance due to Construction-related Activities

2.2.1 Construction related disturbance also has the potential to displace birds from foraging or roosting locations either temporarily or permanently, resulting in a negative impact on the overall health of individual birds and potentially impacting survival rates, and/or productivity at a population level. Disturbance during construction activities is primarily derived from three main sources:

- visual disturbance, due to human presence;
- visual disturbance, in response to moving plant machinery or other vehicles; and
- auditory disturbance, in response to noise from construction activities such as piling.

2.2.2 In the creation of a waterbird disturbance mitigation toolkit, Cutts et al. (2013) identified and characterised the levels of disturbance associated with different aspects of construction. This toolkit was developed to assist developers to assess the risks of disturbance in relation to construction around SPAs. The impact of visual and aural stimuli both decay over increased distances, though the levels of response is typically species or situation specific and a number of factors will dictate whether or not a bird is disturbed by an activity. Cutts et al. (2013) recommended buffer distances (to reduce impacts of visual disturbance for wintering waterbirds) that typically ranged from 100-300m, though this again was dependent on the species present. For example, species such as shelduck or oystercatcher may be affected by visual disturbance up to 500m from the source, while other species (such as ringed plover, grey plover or mallard) may allow humans to approach to within 50-100m before responding. Cutts et al. (2013) also stated that any potential impact of noise should be considered in the context of existing conditions. Existing levels of noise may serve to mask construction noise and in some cases may result in habituation of birds to heightened levels of aural disturbance.

2.2.3 To conclude, it is important to consider the scale, proximity and duration of any construction related disturbance to ensure that suitable measures are in place to reduce impacts. While on-site mitigation measures can be used to reduce the direct impacts of disturbance, indirect effects (such as a reduction in the carrying capacity of a site) may require long-term mitigation measures to be considered, such as the provision of alternative habitat.

2.3 Disturbance due to Recreational Activities

2.3.1 Human recreational activities on or adjacent to waterbodies and watercourses have the potential to cause disturbance to waterbirds. Recreational disturbance is frequently cited as one of the key issues for waterbird populations at SPAs (i.e. at the Upper Nene Valley Gravel Pits SPA) and the subject has been widely studied within the UK. The most frequently recorded sources of recreational disturbance include:

- Walking;
- Jogging;
- Cycling;
- Dog walking (off lead and on lead);
- Wildlife watching;
- Water-sports (sailing, water-skiing, jet-skiing); and
- Angling.

2.3.2 All of these recreational activities occur within and around the SWLW SPA. Public access at some sites, such as at Staines Reservoirs encourages walkers (both with and without dogs), joggers and wildlife watchers, while some private sites, such as Wraysbury I or Wraysbury II are managed for other activities such as angling or sailing.

2.3.3 Walking and wildlife watching have been noted in a number of studies as the most commonly recorded recreational activity around sensitive sites such as SPAs (Fearnley et al. 2010, 2012, Liley et al. 2011, Liley and Fearnley 2012). The impact of walkers is highly variable and will be dependent on the species present, the distance of the pathway/route from the receptor and background levels of disturbance.

2.3.4 For joggers and cyclists, research suggests that their increased speed of approach may result in increased disturbance to birds (as compared to walking). Burger (1981b) found that birds were more responsive when approached by joggers or cyclists, though other studies have shown little to no difference when compared to the impact of walkers.

2.3.5 Walkers with dogs (both on and off lead) are another frequently cited cause of disturbance at sensitive sites (Collop 2016). There are significant differences between the impacts of dogs on and off leads. Lafferty (2001) and Liley and Fearnley (2012) found that walkers with dogs on leads were no more likely to cause disturbance than walkers without dogs. When dogs are off-lead, birds see them as more of a direct threat (and a potential predator) and are more likely to exhibit disturbance responses.

2.3.6 Watersports frequently result in disturbance to waterbirds, with high levels of activity on a waterbody making sites unsuitable for birds. Motorised vessels (such as jet-skis, ribs or other motorboats) typically have a greater impact due the higher levels of noise and speed associated with them (Briggs 2007). Birds typically allow much closer approach of non-motorised watercraft (such as sailing boats, canoes, wind surfers and paddle boards) with these activities generally resulting in lower levels of disturbance.

2.3.7 The impact of angling is generally determined by the intensity and level of the activity at a site, and at quiet locations, the impact of an angler will likely be similar (or less) to that of a walker or wildlife watcher. While there may be an initial disturbance, once set up, anglers typically remain 'motionless' for long periods during which birds will habituate to their presence. However, at busy, commercial angling lakes, high levels of human activity around the shore can result in a site becoming unsuitable for all but the most tolerant of bird species.

2.3.8 To conclude, recreational activities have the potential to cause a wide range of disturbance impacts. While waterbirds are often able to habituate to low or moderate levels of activities such as walking or angling, dog walking (off lead), and activities involving motorised vessels can cause much greater levels of disturbance (such as birds taking flight) that can result in a waterbody becoming unsuitable for waterbirds.

3. Survey Methodology

3.1.1 Disturbance monitoring methodologies are highly variable and tailored to the location, target species and purpose of the study. The methods summarised below, closely follow those recommended by Natural England for the study undertaken at Ditchford Gravel Pits West (FPCR, 2014), a study which focused on disturbance to wildfowl at the Upper Nene Valley Gravel Pits SPA, a site with similar characteristics to the SWLW SPA and many of the same focal species. A full method statement, including a more detailed description of the methods used for the surveys is provided in the Biodiversity Method Statements Document[1].

3.1.2 Waterbird disturbance monitoring was undertaken at the following twelve waterbodies:

- Queen Mother Reservoir - Group 1.
- Wraysbury Reservoir - Group 1.
- King George VI Reservoir - Group 1.
- Wraysbury II (South) - Group 2.
- Kingsmead - Group 2.
- Horton (South) - Group 2.
- Wraysbury I (North) – Group 3.
- Wraysbury II (South) - Group 3.
- Wraysbury II (North) - Group 3.
- Colne Mere – Group 4.
- Staines Reservoir (North) – Group 4.
- Staines Reservoir (South) – Group 4.
- The 12 waterbodies monitored were identified based on their SPA/SSSI status, their proximity to overflying aircraft, and/or their population of notified species and are shown in **Figure 3.1** in **Appendix A**. The surveys focused on a sub-set of target species included within the designations for the SWLW SPA (species in bold) and other statutory protected sites within the survey area, this includes:
  - Gadwall;
  - Shoveler;
  - Tufted duck;
  - Pochard;

[1] The Biodiversity Method Statements document is also appended to the Preliminary Environmental Information Report.

- Great crested grebe;
- Goldeneye;
- Cormorant;
- Goosander;
- Smew; and
- Black-necked grebe.

3.1.3 Two survey visits were undertaken each month across two survey seasons respectively: from November 2016 to March 2017 inclusive and September 2017 to March 2018 inclusive. 20 hours of monitoring was planned at each waterbody during 2016/17 and 28 hours of monitoring at each waterbody during 2017/18.

3.1.4 On arrival at the waterbody, surveyors completed a census of all waterbirds and selected a suitable vantage point from which they could observe the greatest number of target species. Throughout the two-hour observation period surveyors recorded any potential disturbance agents (PDAs) and responses of any target species. Each PDA was given a unique identifier and categorised. The monitored flock was observed throughout the disturbance, with their behaviours and movements described. The strength of the disturbance reaction from the observed flock to the PDA was categorised on a scale (Level) of 1-5:

- Level 1 = no apparent disturbance response (change in behaviour) to the disturbance.
- Level 2 = low disturbance response: birds becoming alert and 'watching' the disturbance source.
- Level 3 = low-moderate disturbance response: birds walk or swim away.
- Level 4 = moderate-major disturbance response: birds take a short flight (of less than 50m), or run away.
- Level 5 = major disturbance response: birds undertake an escape flight of greater than 50m away.

3.1.5 Analysis of aircraft related disturbances was completed using flight data accessed from the Heathrow Webtrak website (Heathrow, 2018). This website provides real time flight tracking data giving details of the altitude, noise level and route of individual aircraft. Summary data detailing the proportion of flights over a chosen area can also be accessed from this source.

4. Results

4.1 Survey Information

4.1.1 Details of the timing, dates and weather conditions during the survey visits are provided in **Appendix C**. During both seasons of survey (non-breeding periods 2016/17 and 2017/18), visits were suspended at Kingsmead and Horton South during February and March following reports of anti-social behaviour at these waterbodies.

4.2 Aircraft Disturbance

Queen Mother Reservoir

4.2.1 **Table D1.1 and Table D1.2**, **Appendix D**, summarise the number of aircraft overflying Queen Mother Reservoir in 2016/2017 and 2017/2018 respectively. Despite regular overflight by both departing and arriving aircraft, no disturbances caused by aircraft were recorded at Queen Mother Reservoir.

4.2.2 The approach route for aircraft arriving from the west, and landing on the northern runway, passes over the southern quarter of the reservoir, typically passing overhead at an altitude of between 220 and 305m. Sound monitoring equipment located in the village of Colnbrook recorded peak noise levels between 54-80dB[2] as aircraft passed overhead.

4.2.3 Aircraft taking off from both runways passed over the waterbody, with between 53-66% of all departing aircraft passing over or close to the reservoir[3]. Departing aircraft have a much wider range of altitudes, typically between 485 and 765m. As with arriving aircraft, the closest monitoring sensor shows peak noise levels at that location between 54-80dB.

2016-2017

4.2.4 A total of 793 aircraft flights were recorded over Queen Mother Reservoir during the 2016/17 survey period, though no aircraft overflights could be recorded during the early March visit due to poor visibility caused by low cloud cover. No disturbance responses from birds using the waterbody were recorded as a result of these overflights.

2017-2018

4.2.5 A total of 1,036 aircraft flights were recorded over Queen Mother Reservoir during the 2017/18 survey period on all 14 survey visits. No disturbance responses from birds using the waterbody were recorded as a result of these overflights.

[2] Noise levels are provided as in dB units from the Webtrack and presented here to illustrate indicative noise levels.

[3] Data accessed from 'Webtrack – My Neighbourhood' website - http://myneighbourhood.bksv.com/lhr/# - percentages taken from annual figures for 2013-2016.

Wraysbury Reservoir

4.2.6 **Table D1.3 and Table D1.4, Appendix D**, summarise the number of aircraft overflying Wraysbury Reservoir and any associated disturbances recorded in 2016/17 and 2017/18 respectively.

4.2.7 The approach route for aircraft arriving from the west, and landing on the southern runway, passes over the northern part of the reservoir, typically passing overhead at an altitude of between 150 and 120m. Sound monitoring equipment located in the village of Colnbrook and along the western edge of the reservoir recorded peak noise levels between 54-80dB as aircraft passed overhead. The approach for planes landing on the northern runway from the west takes planes within 800m-1,000m of the reservoir. Between 2013 and 2016 only 28-33% of all aircraft arrived from the west.

4.2.8 Aircraft taking off from southern runways pass directly over the waterbody, data from 2013-2016 shows that between 32% and 36% of all departing aircraft passing directly over the reservoir[4]. Departing aircraft have a much wider range of altitudes, typically between 335m and 685m. The closest monitoring sensors, located on the western bank of the reservoir, shows peak noise levels at that the waterbody between 72-88dB.

2016-2017

4.2.9 Overflights were recorded on six of the ten surveys with 539 planes recorded passing over the reservoir.

4.2.10 A total of 539 aircraft flights were recorded over Wraysbury Reservoir during the 2016/17 survey period on six of the ten survey visits.

4.2.11 Nine separate bird disturbances were recorded at the waterbody. Eight were recorded on the same day during the first November survey visit, all effecting coot feeding on the reservoir. Level 3 responses (i.e. swim away) were recorded for groups of 30-126 coot, with birds swimming a short distance from feeding areas following the aircraft overflight, before returning to normal behaviour. During the survey visit, aircraft were predominantly arriving from the west and landing on the northern runway, with occasional aircraft landing on the southern runway. Five of the disturbances were caused by aircraft landing on the northern runway.

4.2.12 During the second November survey visit, a flock of approximately 100 coot were subject to disturbance from overflying aircraft resulting in a Level 3 response with the birds moving approximately ten metres from the reservoir shore onto the water. The aircraft in question was departing and had reached an altitude of approximately 500m and was generating noise levels of 75dB.

[4] Data accessed from 'Webtrack – My Neighbourhood' website - http://myneighbourhood.bksv.com/lhr/# - percentages taken from annual figures for 2013-2016.

2017-2018

4.2.13 During the 2017/18 survey period, a total of 1,202 aircraft overflights were recorded over Wraysbury reservoir with overflights noted during every survey visit. Of these, birds using the waterbody exhibited disturbance responses to 20 aircraft overflights.

4.2.14 During the second September visit, there were two Level 3 disturbances caused by aircraft taking an unusual route across the reservoir. Flocks of four and nine tufted duck swam 20m but returned to their previous behaviour after 20 seconds.

4.2.15 Sixteen disturbance responses were recorded on the same day during the first October survey visit, all affecting two tufted duck flocks, ranging between three and 23 individuals, loafing on the reservoir. The majority were Level 3 responses (13), but there were also two Level 2 and one Level 4 responses recorded. The Level 4 disturbance affected 23 tufted duck, displacing them by 150m.

4.2.16 During the second October visit, a Level 5 response was elicited from a plane flying low over the reservoir, causing two tufted duck to fly 100m, and three cormorant to swim 20m away from the disturbance (a Level 3 response). All disturbed birds resettled to their previous activity within two minutes of the disturbance. The final Level 5 disturbance occurred during the first March visit, when three shoveler were displaced off of the reservoir by a low and loud aircraft.

King George VI Reservoir

4.2.17 **Table D1.5 and Table D1.6, Appendix D**, summarise the number of aircraft overflying King George VI Reservoir and any associated disturbances recorded in 2016/17 and 2017/18 respectively. The reservoir is approximately 1km south west of the runway and due to its proximity is only rarely subject to direct overflight. Aircraft taking off from the northern runway are approximately 3,000m away at their closest point and those from the southern runway 1,500m from the northern part of the reservoir.

2016-2017

4.2.18 Aircraft were recorded on seven of the ten surveys completed with 513 flights passing over or close to the reservoir.

4.2.19 There was a single Level 3 disturbance recorded during the first November visit. A small group of three tufted duck swam a short distance in response to an aircraft passing close to the reservoir.

2017-2018

4.2.20 There were no disturbances caused by aircraft overflying King George VI reservoir, though 1,104 planes were recorded taking off during the survey period. Overflights were recorded on all but one survey visit, when planes were coming in to land on both northern and southern runways.

Wraysbury II (South)

4.2.21 **Table D1.7 and Table D1.8, Appendix D**, summarise the number of aircraft overflying Wraysbury II (South) and any associated disturbances recorded in 2016/2017 and 2017/2018 respectively. Between 2013 and 2016 between 28% and 32% of all departing aircraft took routes directly over or close to the waterbody. Arriving aircraft do not pass directly over the waterbody.

4.2.22 Wraysbury II South is regularly overflown from by departing aircraft from both northern and southern runways. Planes passing directly over or proximal to the waterbody are typically at altitudes of between 800m and 1,200m generating peak noise levels at the waterbody of in excess of 60-70dB. The closest noise monitor is located on the south west corner of Wraysbury Reservoir and is approximately 800m from Wraysbury II South

2016-2017

4.2.23 Flights over or close to the waterbody were recorded on eight of the ten survey visits with 261 planes recorded.

4.2.24 There was one aircraft disturbance, with a low flying and loud plane resulting in a Level 4 response with a single tufted duck making a short flight of 20m.

2017-2018

4.2.25 287 overflights were recorded during the survey period. Overflights were recorded during eleven of the fourteen surveys, with the exception being when aircraft were arriving from the west.

4.2.26 Disturbance responses were recorded in target species following three of the aircraft overflights. The first was a Level 2 reaction recorded during the second October survey. This affected 40 tufted duck, causing the birds to become alert briefly. The aircraft was flying at an altitude of 720m, with a peak noise level of 56dB recorded at the nearest noise monitor.

4.2.27 The second was recorded during the first February visit when a low flying plane was recorded causing a Level 2 disturbance response, resulting in 8 gadwall becoming alert before returning to their previous behaviour after 10 seconds. The aircraft was flying at an altitude of 750m, with a peak noise level of 54dB recorded at the nearest monitor.

4.2.28 The final disturbance response recorded was again a Level 2, affecting 17 tufted duck and three gadwall. This aircraft was also within the typical altitude record over this lake at 1,060 metres m altitude, though slightly louder at 65dB.

Kingsmead

4.2.29 **Table D1.9 and Table D1.10 Appendix D**, summarise the number of aircraft overflying Kingsmead and any associated disturbances recorded in 2016/2017 and 2017/2018 respectively. Kingsmead is overflown by departing aircraft which take a variety of different routes across the lake. Between 2013 and 2016 between 28% and 32% of all departing aircraft took routes directly over or close to the waterbody. Arriving aircraft only pass directly

over the waterbody when approaching from the west and landing on the southern runway. Between 2013 and 2016 only 2%-3% of all arrivals used this approach route.

4.2.30 Planes passing directly over or proximal to the waterbody are typically at altitudes of between 500m and 1,200m generating peak noise levels at the waterbody of in excess of 63-75dB. The closest noise monitor is located on the western banker of Wraysbury Reservoir and is approximately 900m from Kingsmead.

2016-2017

4.2.31 Aircraft overflights were recorded during four of the six survey visits completed with 260 aircraft recorded. There were no disturbances caused by aircraft overflight during the surveys.

2017-2018

4.2.32 Aircraft overflights were recorded during all ten survey visits. During the survey period, 257 aircraft overflights were recorded, resulting in five disturbances.

4.2.33 Four of the disturbances were observed on the same day during the first November survey, and all were Level 5. The aircraft caused great crested grebe (1), tufted duck (groups of 3 and 5) and cormorant (5) to flush from the lake, each flying over 600m offsite. Three of the planes were flying at altitudes between 452m and 640m, below typical altitudes for planes over this waterbody. The final plane flew over the waterbody at 782m, a more typical altitude, with peak noise levels recorded at 65dB at the nearest monitor, again typical for planes passing over this waterbody.

4.2.34 The fifth disturbance recorded at Kingsmead, occurred during the second January survey when a plane passed directly over the waterbody at an altitude of 766m. This resulted in a Level 2 disturbance response from 60 gadwall and a Level 3 response from 20 tufted duck swimming a short distance. Both had returned to their previous behaviour less than 20 seconds following the disturbance.

Horton (South)

4.2.35 **Table D1.11 and Table D1.12, Appendix D**, summarise the number of aircraft overflying Horton (South) and any associated disturbances levels recorded in 2016/17 and 2017/18 respectively. Horton (South) is overflown by departing aircraft which take a variety of different routes close to the lake. Directly adjacent to Kingsmead, Horton (South) is subject to similar levels of overflight from departing and arriving aircraft.

4.2.36 Planes passing directly over or proximal to the waterbody are typically at altitudes of between 500m and 1,200m generating peak noise levels at the waterbody of in excess of 63-75dB. The closest noise monitor is located on the western bankner of Wraysbury Reservoir and is approximately 700m from Horton (South).

2016-2017

4.2.37 Horton (South) is regularly overflown by departing aircraft, with arriving aircraft more than 1,500m north of the lake not recorded as interfering with the waterbody. Aircraft overflights

were recorded on four of the six surveys completed with 199 aircraft recorded. There were no disturbances caused by aircraft overflight during the surveys.

2017-2018

4.2.38 Aircraft overflights were recorded on nine of the ten surveys completed at this waterbody. During the survey period, 190 aircraft overflights were recorded, resulting in three disturbances.

4.2.39 A Level 5 disturbance response was recorded during the first September visit, when 330 tufted duck took flight, circled, and left the lake in response to an aircraft taking a different route to others noted throughout the survey. The same aircraft also caused a Level 4 response with 110 tufted duck flying 100 metres before landing on the same waterbody. The plane that caused the disturbance flew at an altitude of 638 metres, below typical altitudes of more than 800m. The noise levels created by the plane were comparable to others passing over this waterbody with peak levels recorded as (66dB) at the nearest noise monitor.

4.2.40 Two Level 2 disturbances responses were also observed, one during the first October survey, and one during the first January survey. A flock of 24 tufted duck became alert in response to a plane flying low over the lake during the October survey, and during the January survey two gadwall became alert while roosting, before returning to a resting behaviour soon after.

Wraysbury I (North)

4.2.41 **Table D1.13 and Table D1.14, Appendix D**, summarise the number of aircraft overflying Wraysbury I (North) and any associated disturbances recorded in 2016/17 and 2017/18 respectively. Wraysbury I (North) is overflown by both departing and arriving aircraft.

4.2.42 Directly south west of Kingsmead, Wraysbury I (North) is subject to similar levels of overflight as described above.

4.2.43 Planes passing directly over or proximal to the waterbody are typically at altitudes of between 600m and 1,200m generating peak noise levels at the waterbody of in excess of 62-72dB. The closest noise monitor is located on the western bank of Wraysbury Reservoir and is approximately 1,500m from Wraysbury I (North).

2016-2017

4.2.44 Aircraft were recorded on seven of the ten surveys completed with 304 aircraft recorded. Three disturbances relating to aircraft were recorded on the waterbody.

4.2.45 Two were recorded affecting tufted duck, caused by arriving aircraft during both survey visits in December. In both instances a Level 3 response was recorded. The disturbance responses were recorded when aircraft were making approaches to the southern runway, the arriving aircraft were both at an altitude between 275m and 300m.

4.2.46 A plane flying over the waterbody caused two gadwall to become alert, a Level 2 response, during the first March visit. This was caused by a departing aircraft recorded at 795m when passing adjacent to the waterbody.

2017-2018

4.2.47 580 overflights were recorded, resulting in two disturbances. Aircraft overflights were recorded during each of the thirteen surveys completed at this waterbody.

4.2.48 Five aircraft caused disturbances at Wraysbury I North with six disturbance responses observed in target species. All five occurred during the second visit in March causing three Level 2 responses and three Level 3 responses. The three Level 2 responses were recorded in flocks of two and 16 tufted duck and an individual goosander. The Level 3 responses were recorded in flocks of ten and 12 tufted duck and an individual goosander.

4.2.49 The aircraft recorded during the survey were recorded between 484m and 971m when overhead or adjacent to the waterbody with all of them creating noise levels between 60 and 64dB.

Wraysbury I (South)

4.2.50 **Table D1.15 and Table D1.16 Appendix D**, summarise the number of aircraft overflying Wraysbury I (South) and any associated disturbances recorded in 2016/17 and 2017/18 respectively. Directly south of Kingsmead, Wraysbury I (south) is subject to similar levels of overflight as described above.

4.2.51 Planes passing directly over or proximal to the waterbody are typically at altitudes of between 600m and 1,200m generating peak noise levels at the waterbody of in excess of 62-72dB. The closest noise monitor is located on the south western corner of Wraysbury Reservoir and is approximately 1,200m from Wraysbury I (South).

2016-2017

4.2.52 Aircraft were recorded on four of the ten surveys completed with 104 aircraft recorded.

4.2.53 No aircraft related disturbances were recorded in 2016/17.

2017-2018

4.2.54 In 2017/18 aircraft were recorded over the waterbody on each of the thirteen survey visits completed. 418 overflying aircraft recorded were recorded resulting in two disturbances.

4.2.55 The first was recorded during the first December survey when an aircraft caused two Gadwall to leave the waterbody, a Level 5 response. The aircraft was arriving on the southern runway and was at an altitude of approximately 312 metres when passing over the waterbody.

4.2.56 The second was recorded during the first February survey when an aircraft caused two gadwall to become alert, a Level 2 response. The aircraft was departing from the southern runway and was recorded at an altitude of 942 metres.

Wraysbury II (North)

4.2.57 **Table D1.17 and Table D1.18 Appendix D**, summarise the number of aircraft overflying Wraysbury II (North) and any associated disturbances recorded in 2016/17 and 2017/18 respectively. Between 2013 and 2016 between 28% and 32% of all departing aircraft took

routes directly over or close to the waterbody. Arriving aircraft do not pass directly over the waterbody.

4.2.58 Wraysbury II (North) is regularly overflown by departing aircraft from both northern and southern runways. Planes passing directly over or proximal to the waterbody are typically at altitudes of between 800m and 1,200m generating peak noise levels at the waterbody of in excess of 60-70dB. The closest noise monitor is located on the south west corner of Wraysbury Reservoir and is approximately 400m from Wraysbury II (North).

2016-2017

4.2.59 Aircraft were recorded on four of the ten surveys completed with 112 aircraft recorded. There were no disturbances caused by aircraft overflight during the surveys.

2017-2018

4.2.60 Aircraft overflights were recorded during thirteen of the fourteen surveys, with the exception being when planes were arriving from the east. 582 overflights were recorded during the survey period, resulting in six disturbances.

4.2.61 The disturbances were recorded across five survey visits, two observed in the first October survey, two in the first November survey, one in the second November survey and the final disturbances recorded in the final March survey. All disturbances were attributed to low flying aircraft, and caused three Level 2, two Level 3, one Level 4, and two Level 5 reactions.

4.2.62 The aircraft during the October disturbances were flying at 470m and 530m respectively. Peak noise levels of 72dB and 80dB were recorded at the nearest monitor. These planes caused Level 3 and Level 4 responses in tufted duck and gadwall

4.2.63 The aircraft that caused the disturbances recorded in November were flying at 820m and 581m respectively. The first recorded peak noise levels of 59dB at the closest monitor while the second created peak noise levels of 71dB. The first plane caused a Level 3 disturbance response in two gadwall. The gadwall reacted by swimming 20 metres, then returning to feeding 180 seconds later. The second plane caused a Level 2 response in 140 tufted duck. The tufted duck looked up at the plane, and resumed loafing 60 seconds later.

4.2.64 During the second November visit, an aircraft caused a Level 4 response in an individual gadwall. The aircraft was recorded flying at an altitude of 903 metres and recorded a peak noise level of 73dB.

4.2.65 On two occasions during the second March survey, aircraft overflying the waterbody caused disturbances. The first aircraft was flying at an altitude of >1000m when adjacent to the waterbody but resulted in a Level 5 response with two tufted ducks flying on to the neighbouring waterbody. These birds were recorded as having only recently arrived at the waterbody which may have made them more susceptible to disturbance. The second aircraft was recorded at approximately 550 metres when passing over the waterbody, this resulted in a group of nine tufted ducks become alert, a Level 2 response.

Colne Mere

4.2.66 **Table D1.19 and Table D1.20, Appendix D**, summarise the number of aircraft overflying Colne Mere and any associated disturbances recorded in 2016/17 and 2017/18 respectively. Colne Mere is directly overflown less frequently than the other waterbodies surveyed.

4.2.67 Between 2013 and 2016 between 16% and 18% of all departing aircraft took routes directly over or close to the waterbody. Arriving aircraft do not pass directly over the waterbody.

4.2.68 Colne Mere is not regularly overflown by departing aircraft with departures from the southern runway more likely to fly directly overhead. Planes passing directly over or proximal to the waterbody are typically at altitudes of between 670m and 1,100m generating peak noise levels at the waterbody of in excess of 63-77dB. The closest noise monitor is located on the south west corner of Wraysbury Reservoir and is approximately 600m from Colne Mere.

2016-2017

4.2.69 14 aircraft were recorded causing a disturbance with 17 disturbance responses recorded (some aircraft affecting more than one species). These ranged from birds becoming alert to leaving the waterbody all together.

4.2.70 Level 2 responses were recorded on three occasions with tufted duck affected twice by large aircraft passing overhead. The third response was recorded in great crested grebe, where a particularly loud engine noise appeared to make the birds become more alert. The aircraft was not observed in this instance.

4.2.71 Level 3 responses were recorded ten times, caused by seven separate overflights of aircraft. Species affected included, tufted duck, pochard, great crested grebe and shoveler. Tufted duck and pochard were the most regularly affected with eight of the responses recorded in these species. Both species, typically found in small mixed flocks together were also recorded diving as planes passed overhead. Single Level 3 responses were recorded for great crested grebe and shoveler. The shoveler response was recorded when an individual bird was feeding amongst a mixed tufted duck and pochard flock.

4.2.72 Level 4 responses were recorded on only two occasions with an individual great crested grebe and three pochard taking flight. On both occasions the birds flew for 3-5 seconds along the length of the waterbody before returning to their previous behaviour.

4.2.73 Level 5 response were recorded on two occasions effecting pochard and cormorant. A group of five pochard flew for around 40 seconds before landing again on the same waterbody. They returned to normal behaviour after approximately 60 seconds. A single cormorant flew away from the water body following an aircraft overflight.

4.2.74 The aircraft responsible for the disturbances at Colne Mere were at altitudes between 365m-915m. Noise monitoring equipment located on the south-western corner of Wraysbury Reservoir, approximately 600 metres from the centre of the waterbody recorded maximum noise levels between 68-86dB.

2017-2018

4.2.75 Aircraft overflights were recorded during twelve of the fourteen survey visits. 116 overflights were recorded during the survey period, resulting in four disturbances.

4.2.76 The four disturbances were recorded across three survey visits, with one recorded in the second November survey, two in the second January visit and a third during the first February visit. All four were attributed to low flying aircraft, causing two Level 2 and one Level 3 disturbance.

4.2.77 The aircraft recorded in the November survey caused a Level 3 response in two pochard which dived and swam away in response to the overflight. The aircraft that caused the first disturbance was flying at an altitude of 940m, with a peak noise level of 71dB recorded at the nearest monitoring station.

4.2.78 The second and third disturbances, both recorded in the second January survey caused Level 2 responses in Goosander with birds becoming alert and looking at planes before returning to their previous behaviour. The aircraft were recorded flying at 914m and 629m.

4.2.79 The fourth disturbance occurred when a large aircraft overflew the waterbody resulting in a Level 3 response in 2 pochard which both dived in response to the aircraft. This aircraft was recorded at 633m when it was adjacent to the waterbody.

Staines Reservoir North

4.2.80 **Table D1.21 and Table D1.22, Appendix D**, summarise the number of aircraft overflying Staines Reservoir North and any associated disturbances recorded in 2016/17 and 2017/18 respectively. Staines Reservoir North is less than 1km directly south of the western end of the southern runway at Heathrow and the waterbody closest to the airport (covered by this survey). However, due to its position there are no direct overflights by aircraft. Flights close to the reservoir were recorded on three of the ten surveys completed with 246 aircraft recorded.

2016-2017

4.2.81 There were three aircraft related disturbances recorded at the site, all involving tufted duck and great crested grebe. On all three occasions Level 5 responses were recorded with birds either flying to distant parts of the northern basin, or also onto the southern basin directly adjacent to the waterbody.

4.2.82 The first instance was recorded when a small passenger jet made an abrupt turn following take off, taking it closer to the waterbody than typical of departing aircraft. This resulted in fourteen tufted ducks flying away from the northern end of the reservoir. However, they were only in flight a short time (5 seconds) and returned to feeding less than a minute after the aircraft had passed.

4.2.83 The second instance was recorded when a departing aircraft, noted by the observer as being low in altitude and quite loud, disturbed two great crested grebes. The same grebes were then involved in the third disturbance when a departing plane caused two tufted duck to relocate within the reservoir, which in turn resulted in the two great crested grebes taking flight.

4.2.84 The aircraft were usually smaller passenger jets which were at altitudes between 120m-240m following take off. Noise monitoring is not available for these flights.

2017-2018

4.2.85 There was just a single direct overflight by a small aircraft recorded during the surveys, though the proximity to planes taking off and landing on the southern runway meaning that aircraft activity is considered a PDA in this instance.

4.2.86 There were two aircraft related disturbances recorded at the site, involving pochard and tufted duck. On both occasions Level 2 responses were recorded with birds becoming alert to the aircraft, but not moving any distance from where they encountered the disturbance.

Staines Reservoir South

4.2.87 **Table D1.23 and Table D1.24, Appendix D**, summarises the number of aircraft overflying Staines Reservoir South and any associated disturbances recorded in 2016/17 and 2017/18 respectively. Staines Reservoir South is roughly 1,500m south of the western end of the southern runway, and due to its location, is rarely overflown directly by aircraft, though the proximity to planes taking off and landing on the southern runway meaning that aircraft activity could be considered a PDA for this waterbody. No disturbances relating to aircraft were recorded in either of the two seasons of survey.

4.3 Non-aircraft disturbance

4.3.1 Table 4.9 summarises the non-aircraft disturbance responses recorded during the surveys in 2016-17 and 2017-18. This included responses to the following PDAs:

- Boats (all types).
- Cyclists.
- Dogs (on lead).
- Dogs (off lead).
- Fishermen.
- Joggers.
- Predators (birds of prey, foxes etc).
- Swimmers.
- Trains.
- Vehicle (cars, 4x4s).
- Walkers.
- Unknown (situations where a typical disturbance response was observed but no obvious cause was recorded).

4.3.2 A summary for each waterbody is provided below.

Queen Mother Reservoir

2016-2017

4.3.3 Boats were the primary PDA occurring 9 times and observed causing a varied strength of disturbance reactions (Levels 1 – 5). Vehicles and predators (red kite) also elicited a varied strength of response from birds whilst the presence of surveyors on the perimeter of the reservoir caused no disturbance responses (Level 1). Target species disturbed included cormorant, tufted duck, great-crested grebe and goldeneye. **Table 4.1** shows summary details of all the disturbances recorded at Queen Mother Reservoir during the 2016/17 survey season, full results are shown in **Table D1.25, Appendix D**.

2017-2018

4.3.4 Walkers typically caused the highest levels of disturbance (Level 5). Vehicles driving the perimeter of the reservoir and boating activity typically caused no disturbance responses (Level 1) though the surveyor driving onto the reservoir wall caused one moderate response (Level 3). Predators (red kite) elicited a varied strength of response from birds. Target species disturbed included cormorant, great crested grebe and tufted duck. **Table 4.1** shows summary details of all the disturbances recorded at Queen Mother Reservoir during the 2017/18 survey season, full results are shown in **Table D1.26, Appendix D**.

Table 4.1 Table summarising the number and source of non-aircraft disturbance recorded at Queen Mother Reservoir – 2016/17 and 2017/18

	2016/2017								2017/2018					
	Disturbance Response								Disturbance Response					
	Number of PDA	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**	**Number of PDA**	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**
Boat	**9**	8		4	1	1	**14**	**2**	5					**5**
Predator	**3**	1		1		1	**3**	**2**	3				1	**4**
Unknown	**1**			2			**1**							
Vehicle	**3**	2				1	**3**	**6**	12		3			**15**
Walker	**4**	16					**16**	**4**					4	**4**
Total	**20**	27	0	7	1	3	**38**	**14**	20	0	3	0	5	28

Wraysbury Reservoir

2016-2017

4.3.5 Boating activity was the primary PDA observed, causing low levels of disturbance (Levels 1 -2). Vehicles driving the perimeter of the reservoir were responsible for the strongest disturbance response (Level 4), though lesser reactions to this stimulus were also observed. Predators (peregrine), swimmers and walkers caused low to moderate disturbances (Levels 1 – 3). Target species disturbed included cormorant, goosander, great-crested grebe, goldeneye, pochard and tufted duck. **Table 4.2** shows summary details of all the disturbances recorded at Wraysbury Reservoir during the 2016/17 survey season, full results are shown in **Table D1.27, Appendix D**.

2017-2018

4.3.6 Walkers were the primary PDA observed. causing a varied strength of disturbance responses (Levels 1 – 4). Vehicles driving the perimeter of the reservoir were responsible for the strongest disturbance responses (Level 4), though lesser responses were also observed. Boating activity and predators caused low to moderate disturbances (Levels 1 – 3). Target species disturbed included cormorant, goosander, great-crested grebe, goldeneye and tufted duck. **Table 4.2** shows summary details of all the disturbances recorded at Wraysbury Reservoir during the 2017/18 survey season, full results are shown in **Table D1.28, Appendix D**.

Table 4.2 Table summarising the number and source of non-aircraft disturbance recorded at Wraysbury Reservoir – 2016/17 and 2017/18

	2016/2017								**2017/2018**					
	Disturbance Response								**Disturbance Response**					
	Number of PDA	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**	**Number of PDA**	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**
Boat	**14**	20	1				**21**	**2**			2			**2**
Predator	**3**	4		1			**5**	**2**	1	2				**2**
Swimmers	**1**	1					**1**							
Vehicle	**3**	2			1			**2**			1		1	**2**
Walker	**5**	3		2			**5**	**11**	9	1	4	1		**15**
Total	**26**	**30**	**1**	**3**	**1**		**35**	**14**	**10**	**2**	**7**	**1**	**1**	**21**

King George VI Reservoir

2016-2017

4.3.7 People undertaking maintenance work on the perimeter of the reservoir, resulting in high noise levels were observed causing low to high disturbances (Levels 1 -5). Vehicles driving the perimeter of the reservoir resulted in a single Level 1 response with birds apparently unaffected by vehicle presence. Predators caused only low disturbance (Levels 1-2), and an unknown stimuli elicited a moderate response (Level 3) on two occasions. The only target species disturbed was tufted duck. **Table 4.3** shows summary details of all the disturbances recorded at King George VI Reservoir during the 2016/17 survey season, full results are shown in **Table D1.29, Appendix D**.

2017-2018

4.3.8 Walkers were the primary PDA observed, causing low to high disturbances (Levels 1 -5) though these were mostly connected to the arrival and movement of the surveyor at the site. Vehicles driving the perimeter of the reservoir were observed as a PDA, they elicited either no or moderate disturbance responses (Level 1 or 3). Predators (peregrine and red kite) caused low to moderate disturbances (Levels 1 or 3), and an unknown disturbance caused a Level 5 response. Target species disturbed included cormorant, great-crested grebe, goldeneye and tufted duck. **Table 4.3** shows summary details of all the disturbances recorded at King George VI Reservoir during the 2017/18 survey season, full results are shown in **Table D1.30, Appendix D**.

Table 4.3 Table summarising the number and source of non-aircraft disturbance recorded at King George VI Reservoir – 2016/17 and 2017/18

	2016/2017								2017/2018					
	Disturbance Response								Disturbance Response					
	Number of PDA	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**	**Number of PDA**	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**
Noise	**2**	1		1		1	**3**							
Predator	**2**	1	1				**2**	**3**	2		1			**3**
Unknown	**2**	1					**1**	**2**					2	**2**
Vehicle	**1**	1					**1**	**3**	2		1			**3**
Walker	**1**					1	**1**	**11**	11	2	8		1	**22**
Total	**8**	**4**	**1**	**1**	**0**	**2**	**9**	**19**	**15**	**2**	**10**	**0**	**3**	**30**

Wraysbury II South

2016-2017

4.3.9 Boating activity elicited the strongest disturbance response (Level 5) but was only recorded on one occasion. Walkers, predators (red kite) and an unknown source caused moderate disturbances (Level 3). Target species disturbed included cormorant, goldeneye, pochard and tufted duck. **Table 4.4** shows summary details of all the disturbances recorded at Wraysbury II South during the 2016/17 survey season, full results are shown in **Table D1.31, Appendix D**.

2017-2018

4.3.10 Boating activity elicited the strongest disturbance response (Level 5) though again was only recorded on one occasion. Walkers and noise from local construction work caused moderate disturbances (Level 2-3). Target species disturbed included cormorant, gadwall and tufted duck. **Table 4.4** shows summary details of all the disturbances recorded at Wraysbury II South during the 2017/18 survey season, full results are shown in **Table D1.32, Appendix D**.

Table 4.4 Table summarising the number and source of non-aircraft disturbance recorded at Wraysbury II South – 2016/17 and 2017/18

	2016/2017							2017/2018						
	Disturbance Response							Disturbance Response						
	Number of PDA	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**	**Number of PDA**	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**
Boat	**1**					1	**1**	**1**					1	**1**
Noise								**1**		1				**1**
Predator	**1**			2			**2**							
Unknown	**1**			1			**1**							
Walker				1			**1**	**4**			3	1		**4**
Total	**3**	**0**	**0**	**4**	**0**	**1**	**5**	**5**	**0**	**1**	**3**	**1**	**1**	**6**

Kingsmead

2016-2017

4.3.11 Non-aircraft disturbances were recorded in low numbers in 2016-2017. Walkers (with and without dogs) were recorded on four occasions but elicited no disturbance response (Level 1) from the species present. A vehicle, a tractor in an adjacent field, caused moderate reactions (Level 3). Target species disturbed included cormorant, gadwall, great-crested grebe, pochard and tufted duck. **Table 4.5** shows summary details of all the disturbances recorded at Kingsmead during the 2016/17 survey season, full results are shown in **Table D1.33, Appendix D**.

2017-2018

4.3.12 Non-aircraft disturbances were recorded in low numbers in 2017-2018. Boating activity elicited moderate to strong disturbance responses (Levels 3 - 5), as did predators, walkers and trains. Shooting close to the waterbody resulted in Level 5 responses for shoveler, gadwall and tufted duck. Target species disturbed included cormorant, gadwall, great-crested grebe, shoveler and tufted duck. **Table 4.5** shows summary details of all the disturbances recorded at Kingsmead during the 2017/18 survey season, full results are shown in **Table D1.34, Appendix D**.

Table 4.5 Table summarising the number and source of non-aircraft disturbance recorded at Kingsmead – 2016/17 and 2017/18

	2016/2017								**2017/2018**					
	Disturbance Response								**Disturbance Response**					
	Number of PDA	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**	**Number of PDA**	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**
Boat								**4**			2		3	**5**
Predator								**1**			2		2	**4**
Shooting								**1**					3	**3**
Train								**1**				1		**1**
Vehicle	**2**			2			**2**							
Walker	**1**	5					**5**	**3**			2		1	**3**
Walker with dog	**3**	15					**15**							
Total	**6**	**20**	**0**	**2**	**0**	**0**	**22**	**10**	**0**	**0**	**6**	**1**	**9**	**16**

Horton (South)

2016-2017 & 2017-2018

4.3.13 There were no non-aircraft disturbances observed on Horton (South).

Wraysbury I North

2016-2017

4.3.14 Boating activity and dog walkers elicited strong disturbance responses (Level 5) but were only recorded on one occasion each. Walkers and predators (birds moving in response to a cormorant) caused moderate disturbances (Level 3 - 4). An unknown source caused a Level 3 disturbance reaction. Target species disturbed included gadwall and tufted duck. **Table 4.6** shows summary details of all the disturbances recorded at Wraysbury I North during the 2016/17 survey season, full results are shown in **Table D1.35, Appendix D**.

2017-2018

4.3.15 Walkers caused the strongest disturbance responses (Level 5), and fishermen and a barking dog caused low to moderate reactions (Levels 2 -4). Target species disturbed included gadwall, goosander, great-crested grebe, goldeneye and tufted duck. **Table 4.6** shows summary details of all the disturbances recorded at Wraysbury I North during the 2017/18 survey season, full results are shown in **Table D1.36, Appendix D**.

Table 4.6 Table summarising the number and source of non-aircraft disturbance recorded at Wraysbury I North – 2016/17 and 2017/18

	2016/2017							2017/2018						
	Disturbance Response							Disturbance Response						
	Number of PDA	Level 1	Level 2	Level 3	Level 4	Level 5	Total No Responses	Number of PDA	Level 1	Level 2	Level 3	Level 4	Level 5	Total No Responses
Boat	**1**					1	**1**							
Dog								**2**		1		1		**2**
Fisherman								**2**		1	1			**2**
Predator	**1**			1			**1**							
Noise								**1**			2			**2**
Other								**2**				2		**2**
Train								**1**		1				**1**

	2016/2017								2017/2018					
	Disturbance Response								Disturbance Response					
	Number of PDA	Level 1	Level 2	Level 3	Level 4	Level 5	Total No Responses	Number of PDA	Level 1	Level 2	Level 3	Level 4	Level 5	Total No Responses
Unknown	**1**			2			**2**							
Walker	**1**				1		**1**	**2**		2			1	**3**
Walker with dog	**1**					1	**1**	**1**	2					**2**
Total	**4**	**0**	**0**	**3**	**1**	**2**	**6**	**11**	**2**	**5**	**3**	**3**	**1**	**14**

Wraysbury I South

2016-2017

4.3.16 Boating activity was the only observed source of disturbance, resulting in a strong response (Level 5). Target species disturbed included gadwall, goldeneye and tufted duck. **Table 4.7** shows summary details of all the disturbances recorded at Wraysbury I South during the 2016/17 survey season, full results are shown in **Table D1.37, Appendix D**.

2017-2018

4.3.17 A train passing close to the waterbody and walker both resulted in a strong disturbance response (Level 5), and an unknown disturbance caused a moderate reaction (Level 3). Target species disturbed included gadwall, goldeneye, cormorant and tufted duck. **Table 4.7** shows summary details of all the disturbances recorded at Wraysbury I South during the 2017/18 survey season, full results are shown in **Table D1.38, Appendix D**.

Table 4.7 Table summarising the number and source of non-aircraft disturbance recorded at Wraysbury I South – 2016/17 and 2017/18

	2016/2017								2017/2018					
	Disturbance Response								Disturbance Response					
	Number of PDA	Level 1	Level 2	Level 3	Level 4	Level 5	Total No Responses	Number of PDA	Level 1	Level 2	Level 3	Level 4	Level 5	Total No Responses
Boat	**2**					4	**4**							
Dog								**1**			2			**2**

	2016/2017								2017/2018					
	Disturbance Response								Disturbance Response					
Train								**1**					1	**1**
Walker								**1**					1	**1**
Total	**2**	**0**	**0**	**0**	**0**	**4**	**4**	**3**	**0**	**0**	**2**	**0**	**2**	**4**

Wraysbury II North

2016-2017

4.3.18 Strong disturbance responses were observed in reaction to walkers with and without a dog (Level 4), though a dog walker was also observed to elicit no disturbance response (Level 1) on another occasion. Target species disturbed included goosander, great-crested grebe, goldeneye, pochard and tufted duck. **Table 4.8** shows summary details of all the disturbances recorded at Wraysbury II North during the 2016/17 survey season, full results are shown in **Table D1.39, Appendix D**.

2017-2018

4.3.19 Walkers were the primary PDA observed and caused typically moderate responses (Level 3-4). A dog off a lead caused birds to display alert behaviour (Level 2), and noise from a nearby chainsaw caused birds to become alert (Level 2). A small boat used by a fisherman caused a Level 5 disturbances that resulted in all of the observed target species to re-locate. Target species disturbed included gadwall, great-crested grebe, and tufted duck. **Table 4.8** shows summary details of all the disturbances recorded at Wraysbury II North during the 2017/18 survey season, full results are shown in **Table D1.40, Appendix D**.

Table 4.8 Table summarising the number and source of non-aircraft disturbance recorded at Wraysbury II North – 2016/17 and 2017/18

	2016/2017							2017/2018						
	Disturbance Response							Disturbance Response						
	Number of PDA	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**	**Number of PDA**	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**
Boat								**1**			1		3	**4**
Dog								**1**		1				**1**
Noise								**1**		1				**1**
Walker	**1**				1		**1**	**6**			6	1		**7**
Walker with Dog	**2**	6		1	1		**8**							
Total	**3**	**6**	**0**	**1**	**2**	**0**	**9**	**9**	**0**	**2**	**7**	**1**	**3**	**13**

Colne Mere

2016-2017

4.3.20 Walkers were the PDA most often recorded resulting in moderate to strong disturbance responses (Levels 3 – 5). Trains travelling close to the waterbody typically caused no disturbance response (Level 1) but did cause a strong reaction on one occasion (Level 4). Overflight by other birds (such as crows) caused some target species to take flight in Level 4 and 5 disturbances, these have been classified as Predator responses. An unknown source elicited a moderate (Level 3) reaction. Target species disturbed included gadwall, cormorant, goosander, goldeneye, pochard, shoveler, great-crested grebe and tufted duck. **Table 4.9** shows summary details of all the disturbances recorded at Colne Mere during the 2016/17 survey season, full results are shown in **Table D1.41, Appendix D**.

2017-2018

4.3.21 Walkers were the PDA most often recorded resulting in varied disturbance responses (Levels 1 – 5). Trains moving through close to the waterbody typically caused no reaction (Level 1) but did cause moderate disturbance responses on two occasions (Level 3). A varied disturbance response was observed from predators (buzzard, grey heron and sparrowhawk) (Levels 1 – 5), and unknown sources also elicited a disturbance of varying strength (Levels 3 -5). Target species disturbed included gadwall, cormorant, goldeneye, pochard, shoveler, great-crested grebe and tufted duck. **Table 4.9** shows summary details of all the disturbances recorded at Colne Mere during the 2017/18 survey season, full results are shown in **Table D1.42, Appendix D**.

Table 4.9 Table summarising the number and source of non-aircraft disturbance recorded at Colne Mere – 2016/17 and 2017/18

	2016/2017							2017/2018						
	Disturbance Response							Disturbance Response						
	Number of PDA	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**	**Number of PDA**	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**
Dog								**3**			2	2	1	**5**
Predator	**2**				1	1	**2**	**4**	2	1			1	**4**
Train	**5**	4	1			1	**6**	**6**	6		5			**11**
Unknown	**1**			1			**1**	**2**			1	1	2	**4**
Walker	**8**			6	1	3	**10**	**7**	5	1	2	2	2	**12**
Total	**16**	**4**	**1**	**7**	**2**	**5**	**19**	**22**	**13**	**2**	**10**	**5**	**6**	**36**

Staines Reservoir North

2016-2017

4.3.22 Walkers were the PDA most often recorded, typically resulting in moderate (Level 3) disturbances though weak and strong reactions were also observed. Similarly, joggers and dog walkers tended to only elicit a moderate (Level 3) reaction. Target species disturbed included gadwall, goldeneye, pochard, shoveler and tufted duck. **Table 4.10** shows summary details of all the disturbances recorded at Staines Reservoir North during the 2016/17 survey season, full results are shown in **Table D1.43, Appendix D**.

2017-2018

4.3.23 Walkers were the PDA most often recorded, typically resulting in low to moderate (Levels 1 - 3) disturbances though stronger reactions were also observed. Dog walkers and cyclists tended to only elicit a moderate reaction. Vehicles and predators (peregrine, buzzard, merlin and fox) showed a more varied disturbance response ranging from Levels 1 – 5. Target species disturbed included gadwall, cormorant, goldeneye, pochard, shoveler, great-crested grebe and tufted duck. **Table 4.10** shows summary details of all the disturbances recorded at Staines Reservoir North during the 2017/18 survey season, full results are shown in **Table D1.44, Appendix D**.

Table 4.10 Table summarising the number and source of non-aircraft disturbance recorded at Staines Reservoir North – 2016/17 and 2017/18

	2016/2017							2017/2018						
	Disturbance Response							Disturbance Response						
	Number of PDA	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**	**Number of PDA**	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**
Cyclist								**1**			1			**1**
Dog								**1**					2	**2**
Jogger	**8**	1		22			**23**	**1**	3					**3**
Predator								**4**	14			1		**15**
Vehicle								**3**		1	2		2	**5**
Walker	**34**	3	1	45	3	5	**57**	**15**	34	2	4	1	1	**42**
Walker with Dog	**9**	2		17	2		**21**	**7**	3		4	1		**8**
Total	**51**	**6**	**1**	**84**	**5**	**5**	**101**	**32**	**54**	**3**	**11**	**3**	**5**	**76**

Staines Reservoir South

2016-2017

4.3.24 Walkers were the PDA most often recorded, typically resulting in moderate (Level 3) disturbances, though other reactions were also observed. Similarly, joggers and vehicles tended to elicit a moderate reaction though again, other reactions were observed. Dog walkers caused moderate to strong disturbances (Levels 3 – 5). Target species disturbed included gadwall, cormorant, goldeneye, black-necked grebe, shoveler, great-crested grebe and tufted duck. **Table 4.11** shows summary details of all the disturbances recorded at Staines Reservoir South during the 2016/17 survey season, full results are shown in Table **D1.45, Appendix D**.

2017-2018

4.3.25 Dog walkers were the PDA most often recorded, resulting in a varied disturbance reaction (Levels 1 -5). Similarly, walkers without dogs also caused a mixed reaction from birds. Joggers were recorded causing low disturbance (Level 2) on one occasion, and predators (great black-backed gull, sparrowhawk and peregrine) were observed to elicit a strong (Level 4) reaction. Target species disturbed included gadwall, cormorant, goldeneye, pochard, shoveler, great-crested grebe and tufted duck. **Table 4.11** shows summary details of all the disturbances recorded at Staines Reservoir South during the 2017/18 survey season, full results are shown in **Table D1.46, Appendix D**.

Table 4.11 Table summarising the number and source of non-aircraft disturbance recorded at Staines Reservoir South – 2016/17 and 2017/18

	2016/2017							2017/2018						
	Disturbance Response							Disturbance Response						
	Number of PDA	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**	**Number of PDA**	Level 1	Level 2	Level 3	Level 4	Level 5	**Total No Responses**
Jogger	**10**	2		11			**13**	**2**	5	1				**6**
Predator								**2**				6		**6**
Unknown								**2**				2	1	**3**
Vehicle	**2**			1	1		**2**							
Walker	**23**	6	2	42	3	5	**58**	**3**	7				1	**8**
Walker with Dog	**6**	1	3	10	1	3	**18**	**6**	8		2		1	**11**
Total	**41**	**9**	**5**	**64**	**5**	**8**	**91**	**15**	**20**	**1**	**2**	**8**	**3**	**34**

5. Discussion

5.1 Aircraft disturbances and evidence for habituation

5.1.1 Despite aircraft departing or arriving at Heathrow Airport on a near continuous basis during the survey period, only low numbers of disturbance response to aircraft were recorded. **Table 5.1** summarises the number of overflights and disturbances (Levels 2-5) recorded during both survey periods.

5.1.2 Across both seasons of survey 9,240 overflights were recorded at the twelve waterbodies resulting in 82 disturbances responses – just under 1% of the total number of flights. Overall this suggests widespread levels of habituation to aircraft overflight.

5.1.3 No disturbances relating to aircraft were recorded at three of the reservoirs, Queen Mother, King George VI and Staines Reservoir (South) with low numbers (fewer than eleven) recoded at Wraysbury I (North and South), Wraysbury II (North and South), Kingsmead, Horton South and Staines Reservoir (North) further supporting the assumption that the non-breeding bird populations have become tolerant of the overflying aircraft (2017, Department for Transport)

5.1.4 Only at Wraysbury Reservoir and Colne Mere were a greater number (more than 20) disturbance responses recorded.

5.1.5 In both seasons, aircraft disturbances at Wraysbury Reservoir were concentrated around individual survey visits. For example, eight of the nine responses recorded in 2016-2017 occurred during a single visit in early November with a coot flock experiencing repeat disturbance throughout the survey. Similarly, during 2017-2018 sixteen of the eighteen disturbance responses were recorded during a single visit in October with a tufted duck flock experiencing repeated disturbance. In both instances response levels were moderate with groups of birds swimming a short distance from the disturbance source.

5.1.6 Similar effects were not recorded at any other point during the monitoring programme, suggesting that factors other than aircraft overflight may have influenced the behaviour of the birds during these visits. The size of a flock can influence behaviour with larger flocks generally much more susceptible to disturbance than individual birds (Platteeuw and Henkens 1997) while site conditions such as cover, and food levels may also influence behaviour.

5.1.7 Disturbances were most regularly recorded at Colne Mere in 2016-2017 with seventeen disturbance responses recorded during five survey visits. Moderate, Level 3 responses were most common with mixed flocks of pochard and tufted duck the most frequently effected species. Colne Mere is directly overflown less frequently than the other waterbodies surveyed (except for Staines Reservoir North and South) with less than 2% of the observed aircraft passing over or adjacent to the waterbody in the two years of monitoring.

5.1.8 The aircraft responsible for the disturbances at Colne Mere were at altitudes between 365-915 metres. Noise monitoring equipment located on the south-western corner of Wraysbury

Reservoir, approximately 600 metres from the centre of the waterbody recorded maximum noise levels between 68-86dB.

5.1.9 Of the 14 aircraft that caused observed disturbance responses ten were larger, inter-continental passenger jets and include Boeing 747, 777 and 787 and also Airbus A380. Observers noted that planes that caused disturbances were normally manoeuvring/turning directly over the waterbody or appeared to be lower than other planes observed.

5.1.10 Infrequent overflight and variation in the routing of planes over Colne Mere may inhibit habituation of birds at this location. However, only a low number of flight responses (two Levels 4 and two Level 5 responses in 2016/17) were recorded, suggesting a reluctance for the birds to leave the waterbody. Colne Mere has low levels of human disturbance and offers feeding and roosting opportunities for both dabbling and diving duck species.

5.1.11 Overall the data collected suggests widespread habituation of waterbirds to aircraft overflight with low percentages of aircraft causing disturbance (less than 1%). Flight responses (Level 4 and Level 5) to aircraft were only recorded in low numbers with four Level 4 responses and eleven Level 5 responses recorded in both seasons.

Table 5.1 Summary of aircraft overflight totals per waterbody and associated disturbances

Waterbody	Number of overflights			Number of aircraft causing a disturbance			% of overflights causing a disturbance		
	2016/17	2017/2018	Total	2016/17	2017/2018	Total	2016/17	2017/2018	Combined %
Queen Mother Reservoir	793	1,120	1,913	0	0	0	0.00	0.00	0.00
Wraysbury Reservoir	539	1,202	1,741	9	20	29	1.67	1.66	1.67
King George VI Reservoir	513	1,104	1,617	1	0	0	0.19	0.00	0.00
Wraysbury II (South)	261	287	548	1	4	5	0.38	1.39	0.91
Kingsmead	260	255	515	0	5	5	0.00	1.96	0.97
Horton (South)	199	190	389	0	3	3	0.00	1.58	0.77
Wraysbury I (North)	304	580	884	3	5	8	0.99	0.86	0.90
Wraysbury I (South)	104	418	522	0	2	2	0.00	0.48	0.38
Wraysbury II (North)	112	582	694	0	7	7	0.00	1.20	1.01
Colne Mere	51	116	167	13	4	17	25.49	3.45	10.18
Staines Reservoir (North)	246	0	246	4	2	6	1.63	-	2.44
Staines Reservoir (South)	3	1	4	0	0	0	0.00	0.00	0.00
Total			9,240			82			0.89

5.2 Other disturbance sources

5.2.1 **Table 5.2** summarises the number of non-aircraft disturbance responses (Levels 2-5) recorded at each waterbody.

5.2.2 Low numbers of non-aircraft disturbances (causing fewer that twenty recorded in each survey period) were recorded at all of the other waterbodies with the exception of Staines Reservoir North and South during 2016/17 and Colne Mere in 2017/18.

5.2.3 Staines Reservoir features a popular public right of way along the centre of the two basins and is regularly used by birdwatchers, walkers, joggers and dog walkers with 177 disturbance responses recorded at this location. 175 of these disturbances were caused by recreational users of the footpath resulting in predominantly moderate, Level 3 responses.

5.2.4 In most cases birds feeding in the shallow water at the edge of the reservoir were disturbed as people and dogs move up and down the footpath. In response the birds typically swam a short distance away from the reservoir edge before returning to feeding after the disturbance had passed. In 2017/18 maintenance work at Staines Reservoir meant that the southern basin was drained of water from September – January and lower than normal water levels were observed in the northern basin. This change in conditions meant that any birds present on the reservoirs were further from footpath and therefore less susceptible to disturbance.

5.2.5 At Colne Mere, disturbances were caused by several sources, this included passing trains, dogs and walkers. This waterbody benefits from wooded cover around the perimeter and is not easily accessible to the public. Disturbances here were less frequent but typically resulted in responses from multiple species. For example, disturbance caused by a passing train effected gadwall, tufted duck, pochard and great crested grebe.

Table 5.2 Summary of non-aircraft disturbance responses for each waterbody

	Total of non-aircraft disturbances (levels 2-5)		
Waterbody	2016/17	2017/18	Total
Queen Mother Reservoir	11	8	19
Wraysbury Reservoir	5	11	16
King George VI Reservoir	6	15	21
Wraysbury II South	5	6	11
Kingsmead	2	16	18
Horton South	0	0	0
Wraysbury I North	6	12	18

	Total of non-aircraft disturbances (levels 2-5)		
Wraysbury I South	4	4	8
Wraysbury II North	3	13	16
Colne Mere	15	23	38
Staines Reservoir North	95	22	117
Staines Reservoir South	82	14	96

5.2.6 **Table 5.3** summarises the number of disturbances by disturbance agent for all waterbodies across the two seasons of survey. More than 72% of all disturbances recorded were caused by the presence of humans on the sides of waterbodies (i.e. walkers, joggers, dog walkers). This data is dominated by the results from Staines Reservoir in the first year of survey but highlights the potential impact of human activity at waterbodies.

5.2.7 Visual disturbance by humans undertaking recreational activities at waterbodies is recognised as one of the more significant sources of disturbance for non-breeding and breeding birds. The ANPS HRA documents has identified a potential increase in recreational activities caused by an influx of additional workers to the area and the subsequent increase in passengers travelling from the airport as a potential impact of the runway development.

Table 5.3 Summary of disturbance sources across all waterbodies

Source of Disturbance	Total Number of Disturbance Responses (Levels 2-5)	Percentage of Total
Boat	25	7.00
Dog (off lead)	12	3.36
Fisherman	2	0.56
Jogger	34	9.52
Predator	25	7.00
Shooting	3	0.84
Train	10	2.80
Unknown	5	1.40
Vehicle	17	4.76

Source of Disturbance	Total Number of Disturbance Responses (Levels 2-5)	Percentage of Total
Walker	177	49.58
Walker with Dog	47	13.17
Total	357	

5.3 Disturbance of Gadwall and Shoveler

5.3.1 **Table 5.4** and **Table 5.5** summarises the sources and levels of disturbance effecting the two SPA species, Gadwall and Shoveler for the two years of survey.

5.3.2 Gadwall were recorded on 126 occasions exhibiting a disturbance response (Levels 2-5) taking into account all disturbance sources.

5.3.3 Low numbers of aircraft disturbances were recorded and were only recorded taking flight in response to a plane on three occasions. Two Level 5 responses were recorded at Wraysbury I South and Wraysbury II North with two and one gadwall displaced respectively. In both instances, the plane was recorded to be low and manoeuvring over the waterbody. The Level 4 response was again recorded at Wraysbury II North with a single gadwall displaced a short distance by a low flying aircraft.

5.3.4 Human presence such as walkers, dog walkers and joggers caused the highest number of disturbances to gadwall with ninety-eight disturbance responses recorded. These were dominated by results from Staines Reservoir North and South from 2016/17 where gadwall, feeding with coot in the shallows of the reservoir, were disturbed by recreational users of the footpath that crosses the site. This resulted in moderate responses with Gadwall swimming a short distance before returning to their previous behaviour once the disturbance source had passed.

5.3.5 Shoveler were recorded on thirty occasions exhibiting a disturbance response (Levels 2-5) taking into account all disturbance sources.

5.3.6 Low numbers or aircraft disturbance were recorded with a single Level 3 response recorded in 2016/17 at Colne Mere and a single Level 5 response recorded in 2017/18 at Wraysbury Reservoir. The Level 3 response was a single shoveler swimming away a short distance from a plane overhead. This bird was in a mixed flock of tufted duck and pochard, and may have reacted in response the other birds. The Level 5 response was also in response to a low flying aircraft – in this instance a small group of three shoveler were flushed from the reservoir. Shoveler occurred in low numbers at Wraysbury reservoir and the site is open without any areas of vegetated cover.

5.3.7 Human activity such as walkers, dog-walking and jogging caused low numbers of disturbance responses for shoveler. The one notable observation came from Staines Reservoir South where a Thames Water vehicle driving around the edge of the reservoir flush a roosting flock of 200 bird from the side of the reservoir onto the water (a flight of less than 50m).

Table 5.4 Summary of disturbance levels and sources for Gadwall, 2016/17 and 2017/18

	Gadwall									
	2016/17					2017/18				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Aircraft	9	1				1	5	1	1	2
Boat					1					2
Dog off Lead								1	1	
Jogger		1	15			1				
Noise							1			
Predator						2	1	1	2	1
Shooting										1
Train						2	1	1		
Unknown			1						1	
Vehicle			1							
Walker	4		51	2	3	8	1	4	2	4
Walker with Dog	4		12	1	1	2		1	1	

Table 5.5 Summary of disturbance levels and sources for Shoveler, 2016/17 and 2017/18

	Shoveler									
	2016/17					2017/18				
	1	2	3	4	5	1	2	3	4	5
Aircraft	2		1							1
Dog off lead										1
Jogger			3							
Predator						2			3	
Shooting										1
Train										
Unknown									1	1
Vehicle				1			1			2
Walker			2		3	7				2
Walker and Dog						4				1

6. Conclusions

6.1.1 Existing levels of disturbance within the SWLW SPA and supporting functional habitat are dictated by the varying levels of activity at publicly accessible waterbodies and restricted access to the general public at the privately-owned waterbodies.

6.1.2 Aircraft disturbances occurred in low numbers with less than 1% of observed overflights causing a disturbance of any level suggesting that the local waterbird population are habituated to overflight by aircraft. However, the results of the monitoring complete in 2016/17 and 2017/18 suggest that waterbirds using waterbodies that are less frequently overflown (such as Colne Mere) are more susceptible to aircraft disturbance, especially where aircraft are at lower altitudes than is normal and also when manoeuvring.

6.1.3 Dedicated protocols for flights passing directly overhead waterbodies could be employed to further minimise the risk of disturbance such as minimum altitudes and clearly designated flight routes.

6.1.4 Disturbance of the SPA designated species by other human activities such as walking, bird watching, and jogging is already heavily constrained by the access available. Only at sites with good public access such as Staines Reservoir North and South were moderate levels of disturbance observed.

6.1.5 Provision of compensatory open water will be part of the mitigation measures as part of the HEP. While open water offers opportunities for recreation as public space, considerations should be given to creating private or low disturbance areas that are suitable for the notable species present in the area during the non-breeding season.

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APPENDIX A
FIGURES

Development Consent Order limits

South West London waterbodies Special Protection Area/Ramsar site

Surveyed waterbodies

Waterbody reference number and name

Wraysbury Complex

5 Queen Mother Reservoir
6 Kingsmead
7 Horton (South)
8 Wraysbury Reservoir
9 Wraysbury I (North)
10 Wraysbury I (South)
11 Wraysbury II (North)
12 Wraysbury II (South)
14 Colne Mere
21 King George VI Reservoir
22 Staines Reservoir (North)
23 Staines Reservoir (South)

0 125 250 500 750 1,000 1,250 1,500 Metres

Scale 1:25,000

© Heathrow Airport Limited	Scale 1:25,000
Project Name: Heathrow Expansion Project	Heathrow Project No.: HEP53

Title

Figure 3.1: Map showing the waterbodies included in the winter disturbance surveys 2016 - 2017 and 2017 - 2018

Ornithology disturbance report

Company	Drawn By	Chk/Approved	Drawn Date	Status
Wood	Wood	Wood	18/12/2019	FINAL

Location-Level-Sub Series/System-Identifier: HEP53-XX-GA-XXX-361622

Version: 1.0

Document Uncontrolled When Printed

ISO A3 Landscape

ES source file: 39153-Lon2448

APPENDIX B
BTO SPECIES CODES

BTO Species code	Vernacular English name	*Scientific name*
GA	Gadwall	*Anas strepera*
T.	Teal	*Anas crecca*
SV	Shoveler	*Anas clypeata*
PO	Pochard	*Aythya ferina*
TU	Tufted duck	*Aythya fuligula*
GN	Goldeneye	*Bucephala clangula*
SY	Smew	*Mergellus albellus*
GD	Goosander	*Mergus merganser*
GG	Great crested grebe	*Podiceps cristatus*
BN	Black-necked grebe	*Podiceps nigricollis*
CO	Coot	*Fulica atra*

APPENDIX C
SURVEY INFORMATION

Table C1.1: Full details of survey timings and weather data for surveys undertaken at Queen Mother Reservoir – 2016-2017

Survey visit	Surveyor	Date	Time	Weather Conditions
1	CB	11/11/2016	12:10 – 14:10	Temp 6°C, cloud 0/8 Oktas, visibility > 2 km, north-easterly BF2, precipitation: none
2	CB	22/11/2016	13:48 – 15:48	Temp 9°C, cloud 5/8 Oktas, visibility > 2 km, south-westerly, BF4, precipitation: none
3	RC	05/12/2016	13:20 – 15:20	Temp 4°C, cloud 6/8 Oktas, visibility > 2 km, BF 0 precipitation: none
4	RC	13/12/2016	13:15 – 15:15	Temp 10°C, cloud 8/8 Oktas, visibility > 2 km, southerly, BF2, precipitation: intermittent drizzle
5	RC	17/01/2017	13:50 – 15:50	Temp 2°C, cloud 2/8 Oktas, visibility > 2 km, BF0, precipitation: none
6	RC	31/01/2017	13:35 – 15:35	Temp 8°C, cloud 8/8 Oktas, visibility > 2 km, south-easterly BF2/3, precipitation: intermittent drizzle
7	CB	08/02/2017	13:00 – 15:00	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, north-easterly BF2, precipitation: light drizzle
8	RC	28/02/2017	13:10 – 14:40	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, westerly BF3/4, precipitation: intermittent drizzle
9	CB	01/03/2017	13:40 – 15:40	Temp 6°C, cloud 8/8 Oktas, visibility > 2 km, south-westerly BF4, precipitation: none
10	RC	27/03/2017	14:20 – 16:20	Temp 11°C, cloud 1/8 Oktas, visibility > 2 km, north-easterly BF2, precipitation: none

Table C1.2: Full details of survey timings and weather data for surveys undertaken at Wraysbury Reservoir – 2016-2017

Survey visit	Surveyor	Date	Time	Weather Conditions
1	CB	11/11/2016	09:48 – 11:48	Temp 6°C, cloud 1/8 Oktas, visibility > 2 km, north-easterly BF2, precipitation: none
2	CB	22/11/2016	11:28 – 13:28	Temp 9°C, cloud 8/8 Oktas, visibility > 2 km, south-westerly, BF4, precipitation: none
3	RC	05/12/2016	10:55 – 12:55	Temp 4°C, cloud 2/8 Oktas, visibility > 2 km, BF 0 precipitation: none
4	RC	13/12/2016	10:45 – 12:45	Temp 10°C, cloud 8/8 Oktas, visibility > 2 km, southerly, BF2, precipitation: intermittent drizzle
5	RC	17/01/2017	11:30 – 13:30	Temp 2°C, cloud 3/8 Oktas, visibility > 2 km, easterly, BF1, precipitation: none
6	RC	31/01/2017	11:15 – 13:15	Temp 8°C, cloud 8/8 Oktas, visibility > 2 km, south-easterly BF2/3, precipitation: intermittent drizzle
7	CB	08/02/2017	10:30 – 12:30	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, northerly BF2, precipitation: none
8	RC	28/02/2017	11:00 – 13:00	Temp 4°C, cloud 6/8 Oktas, visibility > 2 km, south-westerly BF2/3, precipitation: intermittent drizle
9	CB	01/03/2017	11:15 – 13:15	Temp 6°C, cloud 6/8 Oktas, visibility > 2 km, south-westerly BF4, precipitation: none
10	RC	27/03/2017	12:00 – 14:00	Temp 11°C, cloud 2/8 Oktas, visibility > 2 km, north-easterly BF2, precipitation: none

Table C1.3: Full details of survey timings and weather data for surveys undertaken at King George VI Reservoir – 2016-2017

Survey visit	Surveyor	Date	Time	Weather Conditions
1	CB	11/11/2016	07:25 – 09:25	Temp 6°C, cloud 1/8 Oktas, visibility > 2 km, north-easterly BF3, precipitation: none
2	CB	22/11/2016	09:05 – 11:05	Temp 9°C, cloud 3/8 Oktas, visibility > 2 km, south-westerly, BF4, precipitation: none
3	RC	05/12/2016	08:15 – 10:15	Temp 4°C, cloud 2/8 Oktas, visibility > 2 km, BF 0 precipitation: none
4	RC	13/12/2016	08:15 – 10:15	Temp 10°C, cloud 8/8 Oktas, visibility > 2 km, southerly, BF2, precipitation: intermittent drizzle
5	RC	17/01/2017	09:00 – 11:00	Temp 2°C, cloud 4/8 Oktas, visibility > 2 km, easterly, BF0, precipitation: none
6	RC	31/01/2017	08:30 – 10:30	Temp 8°C, cloud 8/8 Oktas, visibility > 2 km, south-easterly BF2/3, precipitation: intermittent drizzle
7	CB	08/02/2017	08:00 – 10:00	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, north-eassterly, BF3, precipitation: none
8	RC	24/02/2017	12:30 – 14:30	Temp 6°C, cloud 6/8 Oktas, visibility > 2 km, south-westerly BF4, precipitation: none
9	CB	01/03/2017	08:45 – 10:45	Temp 6°C, cloud 5/8 Oktas, visibility > 2 km, south-westerly BF4, precipitation: none
10	RC	27/03/2017	09:30 – 11:30	Temp 11°C, cloud 8/8 Oktas, visibility > 2 km, north-easterly BF2/3, precipitation: none

Table C1.4: Full details of survey timings and weather data for surveys undertaken at Wraysbury II South – 2016-2017

Survey visit	Surveyor	Date	Time	Weather Conditions
1	AD	10/11/2016	12:50 – 14:50	Temp 7°C, cloud 1/8 Oktas, visibility > 2 km, south-westerly BF1-2, precipitation: none
2	AD	22/11/2016	12:40 – 14:40	Temp 9°C, cloud 7/8 Oktas, visibility > 2 km, south-westerly, BF4, precipitation: none
3	RC	06/12/2016	13:30 – 15:30	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, BF 0 precipitation: none

Survey visit	Surveyor	Date	Time	Weather Conditions
4	DE	12/12/2016	13:00 – 15:00	Temp 6°C, cloud 8/8 Oktas, visibility > 2 km, southerly, BF1, precipitation: light/moderate rain
5	RC	18/01/2017	09:00 – 11:00	Temp 2°C, cloud 1/8 Oktas, visibility > 2 km, easterly, BF1, precipitation: none
6	DE	30/01/2017	14:00 – 16:00	Temp 7°C, cloud 8/8 Oktas, visibility > 2 km, BF0, precipitation: none
7	MS	08/02/2017	13:22 – 15:22	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, easterly, BF1, precipitation: light drizzle
8	DE	22/02/2017	14:35 – 16:35	Temp 12°C, cloud 8/8 Oktas, visibility > 2 km, westerly BF3/4, precipitation: none
9	RH	02/03/2017	14:20-16:20	Temp 8°C, cloud 1/8 Oktas, visibility > 2 km, south-westerly BF5, precipitation: none
10	DE	31/03/2017	08:45 – 10:45	Temp 13°C, cloud 8/8 Oktas, visibility > 2 km, southerly BF1, precipitation: light rain

Table C1.5: Full details of survey timings and weather data for surveys undertaken at Kingsmead – 2016-2017

Survey visit	Surveyor	Date	Time	Weather Conditions
1	AD	10/11/2016	08:00 – 10:00	Temp 7°C, cloud 2/8 Oktas, visibility > 2 km, south-westerly BF0-1, precipitation: none
2	AD	22/11/2016	08:00 – 10:00	Temp 9°C, cloud 7/8 Oktas, visibility > 2 km, south-westerly, BF3-4, precipitation: none
3	RC	06/12/2016	08:10 – 10:10	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, BF 0 precipitation: none
4	DE	12/12/2016	08:10 – 10:10	Temp 6°C, cloud 8/8 Oktas, visibility > 2 km, southerly, BF0-1, precipitation: light/moderate rain
5	RC	18/01/2017	11:30 – 13:30	Temp 2°C, cloud 1/8 Oktas, visibility > 2 km, easterly, BF1, precipitation: none
6	DE	30/01/2017	11:30 – 13:30	Temp 7°C, cloud 8/8 Oktas, visibility > 2 km, BF0, precipitation: none
7				No survey undertaken due to health and safety concerns

Survey visit	Surveyor	Date	Time	Weather Conditions
8				No survey undertaken due to health and safety concerns
9				No survey undertaken due to health and safety concerns
10				No survey undertaken due to health and safety concerns

Table C1.6: Full details of survey timings and weather data for surveys undertaken at Horton (South) – 2016-2017

Survey visit	Surveyor	Date	Time	Weather Conditions
1	AD	10/11/2016	10:15 – 12:15	Temp 7°C, cloud 1/8 Oktas, visibility > 2 km, south-westerly BF0-1, precipitation: none
2	AD	22/11/2016	10:15 – 12:15	Temp 9°C, cloud 7/8 Oktas, visibility > 2 km, south-westerly, BF3-4, precipitation: intermittent rain
3	RC	06/12/2016	10:30 – 11:30	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, BF 0 precipitation: light rain
4	DE	12/12/2016	10:05 – 12:05	Temp 6°C, cloud 8/8 Oktas, visibility > 2 km, southerly, BF1, precipitation: light rain
5	RC	18/01/2017	09:20 – 11:20	Temp 2°C, cloud 1/8 Oktas, visibility > 2 km, easterly, BF1, precipitation: none
6	DE	30/01/2017	09:20 – 11:20	Temp 7°C, cloud 7/8 Oktas, visibility > 2 km, BF0, precipitation: none
7				No survey undertaken due to health and safety concerns
8				No survey undertaken due to health and safety concerns
9				No survey undertaken due to health and safety concerns
10				No survey undertaken due to health and safety concerns

Table C1.7: Full details of survey timings and weather data for surveys undertaken at Wraysbury I (North) – 2016-2017

Survey visit	Surveyor	Date	Time	Weather Conditions
1	ML	10/11/2016	09:30 – 11:30	Temp 7°C, cloud 8/8 Oktas, visibility > 2 km, south-westerly BF1-2, precipitation: none
2	AM	22/11/2016	08:00 – 10:00	Temp 9°C, cloud 5/8 Oktas, visibility > 2 km, south-westerly, BF3-4, precipitation: none
3	DE	05/12/2016	11:00 – 13:00	Temp 4°C, cloud 2/8 Oktas, visibility > 2 km, BF 0 precipitation: none
4	DE	14/12/2016	11:00 – 13:00	Temp 10°C, cloud 8/8 Oktas, visibility > 2 km, south-easterly, BF2/3, precipitation: none
5	DE	17/01/2017	11:10 – 13:10	Temp 2°C, cloud 2/8 Oktas, visibility > 2 km, easterly, BF0, precipitation: none
6	DE	27/01/2017	11:00 – 13:00	Temp 2°C, cloud 8/8 Oktas, visibility > 2 km, south-westerly, BF1, precipitation: none
7	DE	08/02/2017	11:15 – 13:15	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, north-easterly, BF1, precipitation: light rain
8	DE	23/02/2017	07:30 – 09:30	Temp 8°C, cloud 6/8 Oktas, visibility > 2 km, south-westerly, BF8, precipitation: none
9	RH	01/03/2017	11:15 – 13:15	Temp 6°C, cloud 7/8 Oktas, visibility > 2 km, south-westerly, BF3, precipitation: none
10	DE	31/03/2017	11:30 – 13:30	Temp 13°C, cloud 8/8 Oktas, visibility > 2 km, southerly, BF1, precipitation: none

Table C1.8: Full details of survey timings and weather data for surveys undertaken at Wraysbury I (South) – 2016-2017

Survey visit	Surveyor	Date	Time	Weather Conditions
1	ML	10/11/2016	11:45 – 13:45	Temp 7°C, cloud 7/8 Oktas, visibility > 2 km, south-westerly BF2, precipitation: light rain 13:30 – 13:45
2	AM	22/11/2016	10:05 – 12:05	Temp 9°C, cloud 6/8 Oktas, visibility > 2 km, south-westerly, BF3-4, precipitation: light rain
3	DE	05/12/2016	13:15 – 15:15	Temp 4°C, cloud 6/8 Oktas, visibility > 2 km, BF 0 precipitation: none

Survey visit	Surveyor	Date	Time	Weather Conditions
4	DE	14/12/2016	13:15 – 15:15	Temp 10°C, cloud 2/8 Oktas, visibility > 2 km, south-easterly, BF1, precipitation: none
5	DE	17/01/2017	13:30 – 15:30	Temp 2°C, cloud 2/8 Oktas, visibility > 2 km, easterly, BF0, precipitation: none
6	DE	27/01/2017	13:15 – 15:15	Temp 2°C, cloud 6/8 Oktas, visibility > 2 km, south-westerly, BF1, precipitation: none
7	DE	08/02/2017	13:30 – 15:30	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, north-easterly, BF1, precipitation: none
8	DE	23/02/2017	11:30 – 13:30	Temp 8°C, cloud 6/8 Oktas, visibility > 2 km, south-westerly, BF8, precipitation: none
9	RH	01/03/2017	13:45 – 15:45	Temp 6°C, cloud 8/8 Oktas, visibility > 2 km, south-westerly, BF3, precipitation: light rain
10	DE	31/03/2017	13:00 – 15:00	Temp 13°C, cloud 6/8 Oktas, visibility > 2 km, southerly, BF1, precipitation: none

Table C1.9: Full details of survey timings and weather data for surveys undertaken at Wraysbury II (North) – 2016-2017

Survey visit	Surveyor	Date	Time	Weather Conditions
1	ML	10/11/2016	14:10 – 16:10	Temp 7°C, cloud 4/8 Oktas, visibility > 2 km, south-westerly BF2, precipitation: none
2	AM	22/11/2016	12:15 – 14:15	Temp 9°C, cloud 7/8 Oktas, visibility > 2 km, south-westerly, BF3-4, precipitation: none
3	DE	05/12/2016	08:30 – 10:30	Temp 4°C, cloud 1/8 Oktas, visibility > 2 km, BF 0 precipitation: none
4	DE	14/12/2016	08:40 – 10:40	Temp 10°C, cloud 6/8 Oktas, visibility > 2 km, BF0, precipitation: none
5	DE	17/01/2017	08:45 – 10:45	Temp 2°C, cloud 3/8 Oktas, visibility > 2 km, easterly, BF0, precipitation: none
6	DE	27/01/2017	08:45 – 10:45	Temp 2°C, cloud 3/8 Oktas, visibility > 2 km, BF0, precipitation: none
7	DE	08/02/2017	09:00 – 11:00	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, north-easterly, BF1, precipitation: none

Survey visit	Surveyor	Date	Time	Weather Conditions
8	DE	22/02/2017	12:30 – 14:30	Temp 8°C, cloud 6/8 Oktas, visibility > 2 km, westerly, BF3-4, precipitation: none
9	RH	02/03/2017	12:20 – 14:20	Temp 8°C, cloud 2/8 Oktas, visibility > 2 km, westerly, BF3-4, precipitation: none
10	DE	28/03/2017	13:00 – 15:00	Temp 11°C, cloud 5/8 Oktas, visibility > 2 km, southerly, BF1, precipitation: none

Table C1.10: Full details of survey timings and weather data for surveys undertaken at Colne Mere – 2016-2017

Survey visit	Surveyor	Date	Time	Weather Conditions
1	MS	10/11/2016	08:10 – 10:10	Temp 7°C, cloud 1/8 Oktas, visibility > 2 km, south-westerly BF2, precipitation: none
2	MS	22/11/2016	12:45 – 14:45	Temp 9°C, cloud 6/8 Oktas, visibility > 2 km, southerly, BF1-2, precipitation: none
3	MS	06/12/2016	08:10 – 10:10	Temp 4°C, cloud 1/8 Oktas, visibility > 2 km, BF 0 precipitation: none
4	MS	13/12/2016	12:42 – 14:42	Temp 10°C, cloud 5/8 Oktas, visibility > 2 km, BF0-1, precipitation: light rain
5	DE	16/01/2017	08:45 – 10:45	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, easterly, BF0, precipitation: none
6	MS	31/01/2017	12:50 – 14:50	Temp 8°C, cloud 8/8 Oktas, visibility > 2 km, south-easterly, BF1, precipitation: none
7	MS	09/02/2017	08:06 – 10:06	Temp 2°C, cloud 8/8 Oktas, visibility > 2 km, easterly, BF1, precipitation: light drizzle
8	MS	23/02/2017	08:15 – 10:15	Temp 8°C, cloud 6/8 Oktas, visibility > 2 km, south-westerly, BF6-7, precipitation: heavy downpour 08:15
9	RH	03/03/2017	09:30 – 11:30	Temp 8°C, cloud 8/8 Oktas, visibility > 2 km, south-easterly, BF2, precipitation: light rain
10	RC	27/03/2017	17:00 – 19:00	Temp 11°C, cloud 0/8 Oktas, visibility > 2 km, easterly, BF1, precipitation: none

Table C1.11: Full details of survey timings and weather data for surveys undertaken at Staines Reservoir North – 2016-2017

Survey visit	Surveyor	Date	Time	Weather Conditions
1	MS	10/11/2016	10:50 – 12:50	Temp 7°C, cloud 0/8 Oktas, visibility > 2 km, south-westerly BF2, precipitation: none
2	MS	22/11/2016	08:00 – 10:00	Temp 9°C, cloud 0/8 Oktas, visibility > 2 km, southerly, BF4-5, precipitation: none
3	MS	06/12/2016	10:45 – 12:45	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, BF 0 precipitation: none
4	MS	13/12/2016	09:57 – 11:57	Temp 10°C, cloud 8/8 Oktas, visibility > 2 km, BF0, precipitation: light rain
5	DE	16/01/2017	11:30 – 13:30	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, south easterly, BF1, precipitation: light rain
6	MS	31/01/2017	08:10 – 10:10	Temp 8°C, cloud 8/8 Oktas, visibility > 2 km, easterly, BF1, precipitation: light rain
7	MS	09/02/2017	12:42 – 14:42	Temp 2°C, cloud 8/8 Oktas, visibility > 2 km, easterly, BF1-2, precipitation: light drizzle
8	MS	22/02/2017	14:45 – 16:45	Temp 8°C, cloud 6/8 Oktas, visibility > 2 km, westerly, BF4-5 precipitation: light rain
9	RH	02/03/2017	07:30 – 09:30	Temp 8°C, cloud 2/8 Oktas, visibility > 2 km, westerly, BF5, precipitation: none
10	RC	28/03/2017	15:15 – 17:15	Temp 11°C, cloud 8/8 Oktas, visibility > 2 km, south-westerly, BF3-4, precipitation: none

Table C1.12: Full details of survey timings and weather data for surveys undertaken at Staines Reservoir South – 2016-2017

Survey visit	Surveyor	Date	Time	Weather Conditions
1	MS	10/11/2016	12:50 – 14:40	Temp 7°C, cloud 0/8 Oktas, visibility > 2 km, south-westerly BF2, precipitation: none
2	MS	22/11/2016	10:00 – 11:00	Temp 9°C, cloud 0/8 Oktas, visibility > 2 km, southerly, BF4-5, precipitation: none
3	MS	06/12/2016	12:50 – 14:50	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, BF 0 precipitation: none

Survey visit	Surveyor	Date	Time	Weather Conditions
4	MS	13/12/2016	07:55 – 09:55	Temp 10°C, cloud 8/8 Oktas, visibility > 2 km, BF0, precipitation: light rain
5	DE	16/01/2017	13:45 – 15:45	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, south easterly, BF1, precipitation: light rain
6	MS	31/01/2017	10:11 – 12:11	Temp 8°C, cloud 8/8 Oktas, visibility > 2 km, easterly, BF1, precipitation: light rain
7	MS	09/02/2017	10:40 – 12:40	Temp 2°C, cloud 8/8 Oktas, visibility > 2 km, easterly, BF1-2, precipitation: light drizzle
8	MS	22/02/2017	14:45 – 16:45	Temp 8°C, cloud 6/8 Oktas, visibility > 2 km, westerly, BF4-5 precipitation: light rain
9	RH	02/03/2017	09:35 – 11:35	Temp 8°C, cloud 2/8 Oktas, visibility > 2 km, westerly, BF5, precipitation: none
10	RC	28/03/2017	13:15 – 15:15	Temp 11°C, cloud 8/8 Oktas, visibility > 2 km, south-westerly, BF3-4, precipitation: none

Table C1.13: Full details of survey timings and weather data for surveys undertaken at Queen Mother Reservoir – 2017-2018

Survey visit	Surveyor	Date	Time	Weather Conditions
1	CB	13/09/2017	10:30 – 12:30	Temp 16°C, cloud 4/8 Oktas, visibility > 2 km, south westerly BF6, precipitation: light rain
2	CB	26/09/2017	13:25 – 15:25	Temp 18°C, cloud 4/8 Oktas, visibility > 2 km, easterly, BF5, precipitation: none
3	CB	03/10/2017	14:00 – 16:00	Temp 15°C, cloud 4/8 Oktas, visibility < 2 km, westerly, BF2, precipitation: none
4	RW	18/10/2017	15:00 – 16:30	Temp 12°C, cloud 8/8 Oktas, visibility > 2 km, easterly, BF0, precipitation: none. Survey finished early due to health and safety
5	RW	07/11/2017	13:45 – 15:45	Temp 10°C, cloud 7/8 Oktas, visibility > 2 km, easterly, BF1, precipitation: light intermittent rain
6	CB	21/11/2017	14:00 – 16:00	Temp 13°C, cloud 8/8 Oktas, visibility > 2 km, south-westerly BF2, precipitation: none

Survey visit	Surveyor	Date	Time	Weather Conditions
7	CD	01/12/2017	10:50 – 12:50	Temp 6°C, cloud 4/8 Oktas, visibility > 2 km, northerly, BF2, precipitation: none
8	RW	13/12/2017	14:00 – 15:30	Temp 6°C, cloud 7/8 Oktas, visibility > 2 km, westerly BF2, precipitation: light rain developed into heavy lightning storm Survey finished early due to health and safety
9	RW	05/01/2018	13:30 – 15:30	Temp 6°C, cloud 3/8 Oktas, visibility > 2 km, westerly BF3, precipitation: none
10	RW	17/01/2018	14:15 – 16:15	Temp 7°C, cloud 4/8 Oktas, visibility > 2 km, westerly BF3, precipitation: none
11	RW	02/02/2018	13:10 – 13:40	Temp 5°C, cloud 6/8 Oktas, visibility > 2 km, westerly BF4, precipitation: none Survey finished early due to no target species present
12	RW	15/02/2018	14:30 – 16:30	Temp 7°C, cloud 6/8 Oktas, visibility > 2 km, westerly, BF4, precipitation: none
13	RW	08/03/2018	14:45 – 16:45	Temp 10°C, cloud 2/8 Oktas, visibility > 2 km, westerly BF4, precipitation: none
14	CB	13/03/2018	14:15 – 16:15	Temp 10°C, cloud 7/8 Oktas, visibility > 2 km, southerly BF1, precipitation: none

Table C1.14: Full details of survey timings and weather data for surveys undertaken at Wraysbury Reservoir – 2017-2018

Survey visit	Surveyor	Date	Time	Weather Conditions
1	CB	13/09/2017	13:00 – 15:00	Temp 16°C, cloud 6/8 Oktas, visibility > 2 km, south-westerly, BF6, precipitation: light rain
2	CB	26/09/2017	10:50 – 12:50	Temp 17°C, cloud 7/8 Oktas, visibility > 2 km, easterly, BF2, precipitation: none
3	CB	03/10/2017	11:30 – 13:30	Temp 15°C, cloud 1/8 Oktas, visibility > 2 km, westerly, BF2 precipitation: none
4	RW	18/10/2017	12:40 – 14:45	Temp 12°C, cloud 8/8 Oktas, visibility < 2 km, easterly, BF0, precipitation: none

Survey visit	Surveyor	Date	Time	Weather Conditions
5	RW	07/11/2017	10:45 – 12:30	Temp 6°C, cloud 6/8 Oktas, visibility > 2 km, easterly, BF2, precipitation: light rain
6	CB	21/11/2017	11:30 – 13:30	Temp 13°C, cloud 8/8 Oktas, visibility > 2 km, south-westerly, BF2/3, precipitation: intermittent drizzle
7	CD	01/12/2017	08:20 – 10:35	Temp 4°C, cloud 6/8 Oktas, visibility > 2 km, northerly BF3, precipitation: none
8	RW	13/12/2017	11:00 – 13:00	Temp 5°C, cloud 6/8 Oktas, visibility > 2 km, westerly BF5, precipitation: none
9	RW	05/01/2018	11:00 – 13:00	Temp 7°C, cloud 5/8 Oktas, visibility > 2 km, westerly BF2, precipitation: none
10	RW	17/01/2018	12:00 – 14:00	Temp 6°C, cloud 5/8 Oktas, visibility > 2 km, westerly BF2, precipitation: none
11	RW	02/02/2018	11:00 – 13:00	Temp 5°C, cloud 5/8 Oktas, visibility > 2 km, north-westerly BF3, precipitation: none
12	RW	15/02/2018	12:30 – 14:30	Temp 7°C, cloud 3/8 Oktas, visibility > 2 km, south-westerly BF3, precipitation: none
13	RW	08/03/2018	12:30 – 14:30	Temp 9°C, cloud 3/8 Oktas, visibility > 2 km, south-westerly BF4, precipitation: none
14	CB	13/03/2018	12:20 – 14:20	Temp 10°C, cloud 7/8 Oktas, visibility > 2 km, southerly BF1, precipitation: none

Table C1.15: Full details of survey timings and weather data for surveys undertaken at King George VI Reservoir – 2017-2018

Survey visit	Surveyor	Date	Time	Weather Conditions
1	CB	13/09/2017	08:00 – 10:00	Temp 14°C, cloud 1/8 Oktas, visibility > 2 km, south-westerly, BF3, precipitation: none
2	CB	26/09/2017	08:20 – 10:20	Temp 17°C, cloud 8/8 Oktas, visibility > 2 km, easterly, BF1, precipitation: none
3	CB	03/10/2017	10:00 – 12:00	Temp 11°C, cloud 0/8 Oktas, visibility > 2 km, westerly, BF2 precipitation: none

Survey visit	Surveyor	Date	Time	Weather Conditions
4	RW	18/10/2017	10:30 – 12:40	Temp 12°C, cloud 8/8 Oktas, visibility < 2 km, easterly, BF1, precipitation: light rain
5	RW	07/11/2017	08:45 – 10:45	Temp 7°C, cloud 6/8 Oktas, visibility > 2 km, easterly, BF2, precipitation: light intermittent rain
6	CB	21/11/2017	09:00 – 11:00	Temp 13°C, cloud 8/8 Oktas, visibility > 2 km, south-westerly, BF2, precipitation: none
7	CD	01/12/2017	13:25 – 15:25	Temp 6°C, cloud 1/8 Oktas, visibility > 2 km, northerly BF4, precipitation: none
8	RW	13/12/2017	09:00 – 11:00	Temp 3°C, cloud 7/8 Oktas, visibility > 2 km, westerly BF2, precipitation: rain
9	RW	05/01/2018	08:30 – 10:30	Temp 7°C, cloud 5/8 Oktas, visibility > 2 km, westerly BF2, precipitation: none
10	RW	17/01/2018	09:15 – 11:15	Temp 6°C, cloud 8/8 Oktas, visibility > 2 km, westerly BF5, precipitation: none
11	RW	02/02/2018	09:15 – 11:15	Temp 4°C, cloud 5/8 Oktas, visibility > 2 km, north-westerly BF3, precipitation: none
12	RW	15/02/2018	11:00 – 13:00	Temp 9°C, cloud 2/8 Oktas, visibility > 2 km, westerly BF4, precipitation: brief rainfall at 11:25
13	RW	08/03/2018	10:35 – 12:35	Temp 8°C, cloud 6/8 Oktas, visibility > 2 km, south-westerly BF5, precipitation: none
14	CB	13/03/2018	10:00 – 12:00	Temp 11°C, cloud 3/8 Oktas, visibility > 2 km, south-westerly BF1, precipitation: none

Table C1.16: Full details of survey timings and weather data for surveys undertaken at Wraysbury II South – 2017-2018

Survey visit	Surveyor	Date	Time	Weather Conditions
1	RW	13/09/2017	14:30 – 16:30	Temp 13°C, cloud 7/8 Oktas, visibility > 2 km, south-westerly BF4, precipitation: light intermittent rain
2	RW	26/09/2017	09:20 – 11:20	Temp 15°C, cloud 1/8 Oktas, visibility > 2 km, easterly, BF0, precipitation: none
3	RH	03/10/2017	09:15 – 11:15	Temp 12°C, cloud 0/8 Oktas, visibility > 2 km, westerly, BF2 precipitation: none
4	RH	17/10/2017	09:25 – 11:25	Temp 12°C, cloud 2/8 Oktas, visibility > 2 km, south-westerly, BF2, precipitation: none
5	CD	06/11/2017	13:50 – 15:50	Temp 11°C, cloud 2/8 Oktas, visibility > 2 km, south-easterly, BF1, precipitation: none
6	RW	21/11/2107	14:00 – 16:00	Temp 11°C, cloud 7/8 Oktas, visibility > 2 km, south-easterly, BF1, precipitation: none
7	LP	01/12/2017	09:30 – 11:30	Temp 3°C, cloud 5/8 Oktas, visibility > 2 km, northerly, BF3, precipitation: none
8	RH	12/12/2017	13:20 – 15:20	Temp 2°C, cloud 3/8 Oktas, visibility > 2 km, westerly, BF1, precipitation: none
9	RH	04/01/2018	12:50 – 14:50	Temp 11°C, cloud 5/8 Oktas, visibility > 2 km, westerly, BF5, precipitation: none
10	RH	16/01/2018	09:00 – 11:00	Temp 5°C, cloud 1/8 Oktas, visibility > 2 km, westerly, BF1, precipitation: none
11	RH	01/02/2018	12:00 – 14:00	Temp 5°C, cloud 5/8 Oktas, visibility > 2 km, north-westery, BF3, precipitation: none
12	RW	13/02/2018	11:20 – 13:20	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, south-westerly, BF3, precipitation: none
13	RH	06/03/2018	12:00 – 14:00	Temp 8°C, cloud 7/8 Oktas, visibility > 2 km, southerly BF1, precipitation: none
14	RH	13/03/2018	11:20 – 13:20	Temp 11°C, cloud 4/8 Oktas, visibility > 2 km, southerly BF1, precipitation: none

Table C1.17: Full details of survey timings and weather data for surveys undertaken at Kingsmead – 2017-2018

Survey visit	Surveyor	Date	Time	Weather Conditions
1	RW	13/09/2017	08:45 – 10:45	Temp 15°C, cloud 0/8 Oktas, visibility > 2 km, south-westerly BF4, precipitation: none
2	RW	26/09/2017	12:20 – 14:20	Temp 16°C, cloud 6/8 Oktas, visibility > 2 km, easterly, BF0, precipitation: none
3	RH	03/10/2017	12:00 – 14:00	Temp 15°C, cloud 4/8 Oktas, visibility > 2 km, westerly, BF 4 precipitation: none
4	RH	17/10/2017	14:05 – 16:10	Temp 14°C, cloud 8/8 Oktas, visibility > 2 km, south-westerly, BF1, precipitation: light rain
5	CD	06/11/2017	08:15 – 10:15	Temp 2°C, cloud 8/8 Oktas, visibility 200 meters - > 2 km, north-westerly, BF1, precipitation: none
6	RW	21/11/2017	08:00 – 10:00	Temp 10°C, cloud 7/8 Oktas, visibility > 2 km, westerly, BF1, precipitation: none
7	LP	01/12/2017	11:30 – 13:30	Temp 5°C, cloud 4/8 Oktas, visibility > 2 km, northerly, BF3 precipitation: none
8	RH	12/12/2017	08:00 – 10:00	Temp -2°C, cloud 1/8 Oktas, visibility > 2 km, westerly, BF2, precipitation: none
9	RH	04/01/2017	10:35 – 12:35	Temp 11°C, cloud 5/8 Oktas, visibility > 2 km, westerly, BF4, precipitation: none
10	RH	16/01/2017	11:30 – 13:30	Temp 6°C, cloud 4/8 Oktas, visibility > 2 km, westerly, BF4, precipitation: none
11				No survey undertaken due to health and safety concerns
12				No survey undertaken due to health and safety concerns
13				No survey undertaken due to health and safety concerns
14				No survey undertaken due to health and safety concerns

Table C1.18: Full details of survey timings and weather data for surveys undertaken at Horton (South)– 2017-2018

Survey visit	Surveyor	Date	Time	Weather Conditions
1	RW	13/09/2017	11:05 – 13:05	Temp 16°C, cloud 3/8 Oktas, visibility > 2 km, south-westerly BF4, precipitation: none
2	RW	26/09/2017	14:30 – 16:30	Temp 16°C, cloud 4/8 Oktas, visibility > 2 km, easterly, BF0, precipitation: none
3	RH	03/10/2017	14:15 – 16:15	Temp 16°C, cloud 7/8 Oktas, visibility > 2 km, westerly, BF3 precipitation: none
4	RH	17/10/2017	12:15 – 13:15	Temp 15°C, cloud 8/8 Oktas, visibility > 2 km, south-westerly, BF2, precipitation: none
5	CD	07/11/2017	10:20 – 12:20	Temp 7°C, cloud 0/8 Oktas, visibility > 2 km, westerly, BF1, precipitation: none
6	RW	21/11/2017	10:15 – 12:15	Temp 11°C, cloud 7/8 Oktas, visibility > 2 km, southerly, BF1, precipitation: none
7	LP	01/12/2017	13:30 – 15:30	Temp 4°C, cloud 3/8 Oktas, visibility > 2 km, northerly, BF2 precipitation: none
8	RH	12/12/2017	10:05 – 12:05	Temp 0°C, cloud 0/8 Oktas, visibility > 2 km, westerly, BF2, precipitation: none
9	RH	04/01/2017	08:25 – 10:25	Temp 10°C, cloud 8/8 Oktas, visibility 500 m – 2 km, westerly, BF3, precipitation: light rain
10				No survey undertaken due to health and safety concerns
11				No survey undertaken due to health and safety concerns
12				No survey undertaken due to health and safety concerns
13				No survey undertaken due to health and safety concerns
14				No survey undertaken due to health and safety concerns

Table C1.19: Full details of survey timings and weather data for surveys undertaken at Wraysbury I (North) – 2017-2018

Survey visit	Surveyor	Date	Time	Weather Conditions
1	RW	14/092017	11:25 – 12:05	Temp 15°C, cloud 6/8 Oktas, visibility > 2 km, south-easterly BF5, precipitation: none
2	RH	26/09/2017	13:00 – 15:05	Temp 19°C, cloud 4/8 Oktas, visibility > 2 km, north-westerly, BF1, precipitation: none
3	RH	05/10/2017	11:15 – 13:15	Temp 14°C, cloud 2/8 Oktas, visibility > 2 km, BF 0 precipitation: none
4	RW	17/10/2017	12:00 13:05	Temp 13°C, cloud 0/8 Oktas, visibility > 2 km, westerly, BF0, precipitation: none. Survey abandoned due to lack of birds
5	CD	06/11/2017		Not surveyed due to access restrictions
6	RH	21/11/2017	11:00 – 13:00	Temp 15°C, cloud 7/8 Oktas, visibility > 2 km, westerly, BF2, precipitation: none
7	RH	01/12/2017	12:30 – 14:30	Temp 6°C, cloud 1/8 Oktas, visibility > 2 km, northerly, BF3, precipitation: none
8	RW	12/12/2017	12:00 – 14:00	Temp 1°C, cloud 3/8 Oktas, visibility > 2 km, westerly, BF1, precipitation: none
9	RW	04/01/2018	10:20 – 12:20	Temp 7°C, cloud 6/8 Oktas, visibility > 2 km, westerly, BF3, precipitation: none
10	RW	16/01/2018	11:00 – 13:00	Temp 6°C, cloud 2/8 Oktas, visibility > 2 km, westerly, BF2, precipitation: none
11	RW	01/02/2018	14:45 – 16:45	Temp 4°C, cloud 3/8 Oktas, visibility > 2 km, north-westerly, BF3, precipitation: none
12				Not surveyed due to access restrictions
13	RH	08/03/2018	10:45 – 12:45	Temp 7°C, cloud 6/8 Oktas, visibility > 2 km, westerly, BF3, precipitation: none
14	RH	13/03/2018	13:40 – 15:40	Temp 11°C, cloud 5/8 Oktas, visibility > 2 km, westerly, BF1, precipitation: light rain at end of survey

Table C1.20: Full details of survey timings and weather data for surveys undertaken at Wraysbury I (South) – 2017-2018

Survey visit	Surveyor	Date	Time	Weather Conditions
1	RW	14/092017	12:15 – 14:15	Temp 16°C, cloud 6/8 Oktas, visibility > 2 km, south-easterly BF6, precipitation: none
2	RH	26/09/2017	15:15 – 17:15	Temp 19°C, cloud 2/8 Oktas, visibility > 2 km, north-westerly, BF1, precipitation: none
3	RH	05/10/2017	13:15 – 15:15	Temp 15°C, cloud 2/8 Oktas, visibility > 2 km, BF4, north-westerly, precipitation: none
4	RW	17/10/2017	13:10 – 15:10	Temp 13°C, cloud 8/8 Oktas, visibility > 2 km, westerly, BF0, precipitation: none.
5	CD	06/11/2017		Not surveyed due to access restrictions
6	RH	21/11/2017	13:05 – 15:05	Temp 14°C, cloud 4/8 Oktas, visibility > 2 km, westerly, BF2, precipitation: none
7	RH	01/12/2017	10:30 – 12:30	Temp 7°C, cloud 5/8 Oktas, visibility > 2 km, northerly, BF3, precipitation: none
8	RW	12/12/2017	14:00 – 16:00	Temp 1°C, cloud 3/8 Oktas, visibility > 2 km, westerly, BF1, precipitation: none
9	RW	04/01/2018	12:25 – 14:25	Temp 7°C, cloud 6/8 Oktas, visibility > 2 km, westerly, BF4, precipitation: none
10	RW	16/01/2018	13:00 – 15:00	Temp 4°C, cloud 3/8 Oktas, visibility > 2 km, westerly, BF3, precipitation: none
11	RW	01/02/2018	14:45 – 16:45	Temp 6°C, cloud 4/8 Oktas, visibility > 2 km, north-westerly, BF3, precipitation: none
12				Not surveyed due to access restrictions
13	RH	08/03/2018	08:40 – 10:40	Temp 6°C, cloud 6/8 Oktas, visibility > 2 km, westerly, BF3, precipitation: none
14	RH	13/03/2018	13:40 – 15:40	Temp 8°C, cloud 7/8 Oktas, visibility > 2 km, westerly, BF1, precipitation: light rain at end of survey

Table C1.21: Full details of survey timings and weather data for surveys undertaken at Wraysbury II (North) – 2017-2018

Survey visit	Surveyor	Date	Time	Weather Conditions
1	RW	13/09/2017	14:30 – 16:30	Temp 14°C, cloud 6/8 Oktas, visibility > 2 km, south-westerly BF4, precipitation: none
2	RW	26/09/2017	10:20 – 12:20	Temp 15°C, cloud 1/8 Oktas, visibility > 2 km, easterly, BF0, precipitation: none
3	RH	03/10/2017	09:15 – 11:15	Temp 14°C, cloud 2/8 Oktas, visibility > 2 km, BF2, westerly, precipitation: none
4	RH	17/10/2017	10:00 – 12:00	Temp 13°C, cloud 2/8 Oktas, visibility > 2 km, south-westerly, BF2, precipitation: none.
5	CD	06/11/2017	13:50 – 15:50	Temp 10°C, cloud 2/8 Oktas, visibility > 2 km, south-easterly, BF1, precipitation: none.
6	RW	21/11/2017	14:00 – 16:00	Temp 10°C, cloud 7/8 Oktas, visibility > 2 km, southerly, BF1, precipitation: none
7	LP	01/12/2017	09:30 – 11:30	Temp 3°C, cloud 5/8 Oktas, visibility > 2 km, northerly, BF3, precipitation: none
8	RH	12/12/2017	12:30 – 14:30	Temp 2°C, cloud 3/8 Oktas, visibility > 2 km, westerly, BF1, precipitation: none
9	RH	04/01/2018	12:50 – 14:50	Temp 11°C, cloud 6/8 Oktas, visibility > 2 km, westerly, BF5, precipitation: none
10	RH	16/01/2018	09:00 – 11:00	Temp 5°C, cloud 1/8 Oktas, visibility > 2 km, westerly, BF3, precipitation: none
11				
12	RW	13/02/2018	11:20 – 13:20	Temp 4°C, cloud 8/8 Oktas, visibility > 2 km, south-westerly, BF3, precipitation: none
13	RH	06/03/2018	12:00 – 14:00	Temp 8°C, cloud 6/8 Oktas, visibility > 2 km, southerly, BF1, precipitation: light rain
14	RH	13/03/2018	11:20 – 13:20	Temp 9°C, cloud 6/8 Oktas, visibility > 2 km, westerly, BF1, precipitation: none

Table C1.22: Full details of survey timings and weather data for surveys undertaken at Colne Mere – 2017-2018

Survey visit	Surveyor	Date	Time	Weather Conditions
1	CB	14/09/2017	13:45 – 15:45	Temp 14°C, cloud 4/8 Oktas, visibility > 2 km, - north-westerly BF3, precipitation: none
2	MS	29/09/2017	08:45 – 10:45	Temp 16°C, cloud 8/8 Oktas, visibility > 2 km, easterly, BF1, precipitation: none
3	CB	05/10/2017	14:15 – 16:15	Temp 15°C, cloud 2/8 Oktas, visibility > 2 km, BF2, westerly, precipitation: none
4	RH	18/10/2017	13:05 – 15:05	Temp 15°C, cloud 8/8 Oktas, visibility > 2 km, easterly, BF2, precipitation: none.
5	CD	07/11/2017	12:25 – 14:25	Temp 9°C, cloud 7/8 Oktas, visibility > 2 km, southerly, BF4, precipitation: light intermittent rain.
6	MS	21/11/2017	08:20 – 10:20	Temp 12°C, cloud 4/8 Oktas, visibility > 2 km, westerly, BF2, precipitation: none
7	MS	01/12/2017	11:50 – 13:50	Temp 6°C, cloud 0/8 Oktas, visibility, 1 km, northerly, BF2, precipitation: none
8	LR	18/12/2017	12:45 – 14:45	Temp 4°C, cloud 6/8 Oktas, visibility > 2 km, westerly, BF1, precipitation: light showers
9	RH	05/01/2018	08:00 – 10:00	Temp 7°C, cloud 7/8 Oktas, visibility > 2 km, southerly, BF2, precipitation: light intermittent rain
10	RH	18/01/2018	08:15 – 10:20	Temp 7°C, cloud 1/8 Oktas, visibility > 2 km, westerly, BF3, precipitation: none
11	RH	01/02/2018	09:30 – 11:30	Temp 5°C, cloud 1/8 Oktas, visibility > 2 km, westerly, BF3, precipitation: none
12	RH	13/02/2018	09:00 – 11:00	Temp 3°C, cloud 8/8 Oktas, visibility 1 – 1.5 km, south-westerly, BF3, precipitation: rain
13	RH	06/03/2018	09:45 – 11:45	Temp 7°C, cloud 7/8 Oktas, visibility > 2 km, southerly, BF1, precipitation: light rain
14	RH	13/03/2018	08:50 – 10:50	Temp 8°C, cloud 5/8 Oktas, visibility > 2 km, westerly, BF1, precipitation: none

Table C1.23: Full details of survey timings and weather data for surveys undertaken at Staines Reservoir North – 2017-2018

Survey visit	Surveyor	Date	Time	Weather Conditions
1	CB	14/09/2017	10:15 – 12:15	Temp 11°C, cloud 4/8 Oktas, visibility > 2 km, north-westerly BF3, precipitation: none
2	MS	26/09/2017	11:30 – 13:30	Temp 19°C, cloud 7/8 Oktas, visibility > 2 km, easterly, BF1, precipitation: none
3	CB	05/10/2017	10:15 – 12:15	Temp 15°C, cloud 1/8 Oktas, visibility > 2 km, BF3, westerly, precipitation: none
4	RH	18/10/2017	10:25 – 12:25	Temp 13°C, cloud 8/8 Oktas, visibility > 2 km, easterly, BF2, precipitation: none
5	CD	07/11/2017	07:35 – 09:35	Temp 9°C, cloud 8/8 Oktas, visibility > 2 km, southerly, BF4, precipitation: none
6	MS	21/11/2017	13:20 – 15:20	Temp 12°C, cloud 8/8 Oktas, visibility > 2 km, westerly, BF4, precipitation: none
7	MS	01/12/2017	09:00 – 11:00	Temp 1°C, cloud 0/8 Oktas, visibility, > 2 km, northerly, BF5, precipitation: none
8	LR	13/12/2017	10:30 – 12:30	Temp 5°C, cloud 6/8 Oktas, visibility > 2 km, westerly, BF4, precipitation: none
9	RH	05/01/2018	10:30 – 12:30	Temp 8°C, cloud 3/8 Oktas, visibility > 2 km, southerly, BF4, precipitation: none
10	RH	18/01/2018	10:45 – 12:45	Temp 7°C, cloud 2/8 Oktas, visibility > 2 km, westerly, BF3, precipitation: none
11	RH	02/02/2018	09:50 – 11:30	Temp 4°C, cloud 2/8 Oktas, visibility > 2 km, north-westerly, BF3, precipitation: none
12	RH	15/02/2018	08:40 – 10:40	Temp 8°C, cloud 3/8 Oktas, visibility > 2 km, westerly, BF2, precipitation: rain
13	RW	08/03/2018	14:30 – 16:30	Temp 7°C, cloud 7/8 Oktas, visibility > 2 km, south-westerly, BF3, precipitation: none
14	RH	13/03/2018	14:45 – 16:45	Temp 10°C, cloud 8/8 Oktas, visibility > 2 km, westerly, BF3, precipitation: light rain

Table C1.24: Full details of survey timings and weather data for surveys undertaken at Staines Reservoir North – 2017-2018

Survey visit	Surveyor	Date	Time	Weather Conditions
1	CB	14/09/2017	08:10 – 10:10	Temp 11°C, cloud 6/8 Oktas, visibility > 2 km, north-westerly BF3, precipitation: none
2	MS	26/09/2017	13:45 – 15:45	Temp 18°C, cloud 7/8 Oktas, visibility > 2 km, easterly, BF2, precipitation: none
3	CB	05/10/2017	08:15 – 10:15	Temp 15°C, cloud 1/8 Oktas, visibility > 2 km, BF3, westerly, precipitation: none
4	RH	18/10/2017	08:15 – 10:15	Temp 13°C, cloud 8/8 Oktas, visibility > 2 km, easterly, BF2, precipitation: light rain
5	CD	07/11/2017	09:40 – 11:40	Temp 8°C, cloud 8/8 Oktas, visibility > 2 km, southerly, BF4, precipitation: intermittent light rain
6	MS	21/11/2017	11:15 – 13:15	Temp 12°C, cloud 8/8 Oktas, visibility > 2 km, westerly, BF4, precipitation: none
7	MS	01/12/2017	07:30 – 09:30	Temp 1°C, cloud 5/8 Oktas, visibility, > 2 km, northerly, BF5, precipitation: none
8	LR	13/12/2017	08:30 – 10:30	Temp 5°C, cloud 6/8 Oktas, visibility > 2 km, westerly, BF4, precipitation: none
9	RH	05/01/2018	10:35 – 12:35	Temp 8°C, cloud 3/8 Oktas, visibility > 2 km, southerly, BF4, precipitation: none
10	RH	18/01/2018	12:45 – 14:45	Temp 7°C, cloud 4/8 Oktas, visibility > 2 km, westerly, BF3, precipitation: none
11	RH	02/02/2018	07:50 – 09:50	Temp 4°C, cloud 2/8 Oktas, visibility > 2 km, north-westerly, BF4, precipitation: none
12	RH	15/02/2018	09:45 – 11:45	Temp 8°C, cloud 7/8 Oktas, visibility > 2 km, westerly, BF2, precipitation: rain
13	RH	08/03/2018	14:30 – 16:30	Temp 8°C, cloud 6/8 Oktas, visibility > 2 km, southerly, BF2, precipitation: light intermittent rain
14	RH	13/03/2018	12:45 – 14:45	Temp 11°C, cloud 8/8 Oktas, visibility > 2 km, westerly, BF3, precipitation: light rain

APPENDIX D
TABLES

Table D1.1: Summary of aircraft overflights and resulting disturbance responses for Queen Mother Reservoir 2016-2017

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses			
				2	3	4	5
1	86	451	0				
2	79	100	0				
3	123	317	0				
4	92	240	0				
5	106	131	0				
6	81	78	0				
7	60*	189	0				
8	78	27	0				
9	0	23	0				
10	88*	41	0				

* Planes departing or arriving to the north of the reservoir, no direct overflights

Table D1.2: Summary of aircraft overflights and resulting disturbance responses for Queen Mother Reservoir 2017-2018

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses			
				2	3	4	5
1	84	340	0				
2	84	761	0				
3	123	514	0				
4	76	605	0				
5	94	79	0				
6	84	18	0				
7	80	50	0				
8	56	4	0				
9	48	1	0				
10	88	6	0				
11	16	0	0				
12	98	22	0				
13	90	5	0				
14	99	13	0				

Table D1.3.: Summary of aircraft overflights and resulting disturbance responses for Wraysbury Reservoir 2016-2017

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses				Species Effected
				2	3	4	5	
1	78	404	8		8			Coot
2	74	246	1		1			Cormorant
3	0	338	0					
4	92	109	0					
5	99	39	0					
6	85	15	0					
7	0	31	0					
8	111	7	0					
9	0	26	0					
10	0	14	0					

Table D1.4: Summary of aircraft overflights and resulting disturbance responses for Wraysbury Reservoir 2017-2018

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses				Species Effected
				2	3	4	5	
1	100	577	0					
2	88	330	2		2			Tufted Duck
3	92	176	16	2	13	1		Tufted Duck
4	66	159	1		1		1	Cormorant, Tufted Duck
5	102	74	1				1	Shoveler
6	59	80	0					
7	17	87	0					
8	100	89	0					
9	87	66	0					
10	94	38	0					
11	108	18	0					
12	80	41	0					
13	109	11	0					
14	100	43	0					

Table D1.5: Summary of aircraft overflights and resulting disturbance responses for King George VI Reservoir 2016-2017

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses				Species Effected
				2	3	4	5	
1	73*	436	1		1			Tufted Duck
2	80*	402	0					
3	0	191	0					
4	66*	191	0					
5	78*	64	0					
6	0	67	0					
7	8*	70	0					
8	110*	50	0					
9	0	54	0					
10	98*	110	0					

* Planes departing or arriving to the north of the reservoir, no direct overflights

Table D1.6: Summary of aircraft overflights and resulting disturbance responses for King George VI Reservoir 2017-2018

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses			
				2	3	4	5
1	76	933	0				
2	88	262	0				
3	60	165	0				
4	41	145	0				
5	64	296	0				
6	83	207	0				
7	0	80	0				
8	108	147	0				
9	80	48	0				
10	107	10	0				
11	94	18	0				
12	105	20	0				
13	102	30	0				
14	96	28	0				

Table D1.7: Summary of aircraft overflights and resulting disturbance responses for Wraysbury II (South) 2016-2017

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses				Species Effected
				2	3	4	5	
1	60	54	0					
2	69	205	0					
3	0*	11	0					
4	3	158	0					
5	80	35	0					
6	0	61	0					
7	1+	82	1			1		Tufted Duck
8	10	86	0					
9	8#	114	0					
10	30	41	0					

* Low cloud/fog limiting visibility. Also planes taking off using the northern runway, therefore any overhead waterbodies are at greater altitude

+ Planes not directly overhead, most passing to the east, hidden by cloud on approach

Number of planes estimated from webtrack

Table D1.8: Summary of aircraft overflights and resulting disturbance responses for Wraysbury II (South) 2017-2018

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses				Species Effected
				2	3	4	5	
1	16	32	0					
2	0	152	0					
3	42	107	0					
4	8	80	1	1				Tufted Duck
5	14	20	1				1	Grey Heron
6	35	38	0					
7	0	47	0					
8	21	122	0					
9	39	99	0					
10	51	271	0					
11	6	136	1	1				Gadwall
12	26	48	0					
13	29	61	0					
14	0	65	1	2				Gadwall, Tufted Duck

Table D1.9: Summary of aircraft overflights and resulting disturbance responses for Kingsmead 2016-2017

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses			
				2	3	4	5
1	75	118	0				
2	85	216	0				
3	0*	117	0				
4	4	144	0				
5	96	310	0				
6	0	151	0				

* Number of planes estimated from webtrack

Table D1.10 Summary of aircraft overflights and resulting disturbance responses for Kingsmead 2017-2018

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses				Species Effected
				2	3	4	5	
1	36	10	0					
2	6	27	0					
3	44	20	0					
4	39	55	0					
5	29	21	4				4	Cormorant, Great Crested Grebe, Tufted Duck
6	41	159	0					
7	3	162	0					
8	42	261	0					
9	12	262	0					
10	5	196	1	1	1			Gadwall, Tufted Duck

Table D1.11: Summary of aircraft overflights and resulting disturbance responses for Horton (South) 2016-2017

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses			
				2	3	4	5
1	75	77	0				
2	80	143	0				
3	0*	9	0				
4	16**	67	0				
5	28**	315	0				
6	0	399	0				

* Low cloud/fog limiting visibility. Also planes taking off using the northern runway, therefore any overhead waterbodies are at greater altitude

** Number of planes estimated from webtrack

Table D1.12 Summary of aircraft overflights and resulting disturbance responses for Horton (South) 2017-2018

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses				Species Effected
				2	3	4	5	
1	31	488	1			1	1	Tufted Duck
2	4	65	0					
3	21	45	1	1				Tufted Duck
4	24	169	0					
5	19	333	0					
6	44	202	0					
7	0	111	0					
8	26	223	0					
9	21	77	1	1				Gadwall

Table D1.13: Summary of aircraft overflights and resulting disturbance responses for Wraysbury I (North) 2016-2017

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses				Species Effected
				2	3	4	5	
1	56	95	0					
2	82	97	0					
3	4**	182	1		1			Tufted duck
4	16**	131	1		1			Tufted duck
5	0	182	0					
6	0	149	0					
7	75*	106	0					
8	0	72	0					
9	11**	90	1	1				Gadwall
10	60	23	0					

* Planes to the north of the lake - no planes directly over waterbody
** Estimate from Webtrack

Table D1.14 Summary of aircraft overflights and resulting disturbance responses for Wraysbury I (North) 2017-2018

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses				Species Effected
				2	3	4	5	
1	16	0	0					
2	1	15	0					
3	12	10	0					
4	24	3	0					
5	20	0	0					
6	71	63	0					
7	65	105	0					
8	36	155	0					
9	73	120	0					
10	72	88	0					
11	80	86	0					
12	-	-	-					
13	52	117	0					
14	58	57	5	3	3			Tufted duck, goosander

Table D1.15 Summary of aircraft overflights and resulting disturbance responses for Wraysbury I (South) 2016-2017

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses			
				2	3	4	5
1	47	66	0				
2	21	24	0				
3	0	243	0				
4	0	372	0				
5	0	299	0				
6	0	440	0				
7	0	199	0				
8	0	98	0				
9	21*	113	0				
10	15	43	0				

* Estimate from Webtrack

Table D1.16: Summary of aircraft overflights and resulting disturbance responses for Wraysbury I (South) 2017-2018

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses				Species Effected
				2	3	4	5	
1	17	31						
2	6	20						
3	21	14						
4	16	19						
5	17	0						
6	58	123						
7	30	63	1				1	Gadwall
8	71	182						
9	7	196						
10	81	166						
11	41	130	1	1				Gadwall
12	-	-						
13	24	141						
14	29	54						

Table D1.17: Summary of aircraft overflights and resulting disturbance responses for Wraysbury II (North) 2016-2017

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses			
				2	3	4	5
1	17	48	0				
2	15	37	0				
3	0	221	0				
4	0	130	0				
5	0	118	0				
6	0	42	0				
7	0	161	0				
8	45	282	0				
9	0	265	0				
10	35	86	0				

Table D1.18: Summary of aircraft overflights and resulting disturbance responses for Wraysbury II (North) 2017-2018

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses				Species Effected
				2	3	4	5	
1	64	20	0					
2	4	46	0					
3	28	27	2		1	1		Gadwall, tufted duck
4	40	123	0	2	1			Coot, gadwall, tufted duck
5	16	133	2					
6	48	70	1				1	Gadwall
7	20	125	0					
8	55	74	0					
9	49	170	0					
10	75	116	0					
11	70	144	0					
12	19	51	0					
13	59	55	0					
14	35	50	2	1			1	Tufted duck

Table D1.19: Summary of aircraft overflights and resulting disturbance responses for Colne Mere 2016-2017

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses				Species Effected
				2	3	4	5	
1	5	104	2	1			1	Great crested grebe, pochard
2	14	127	3	1	4			Great crested grebe, pochard, shoveler, tufted duck
3	0*	118	0					
4	21	112	5		4	2	1	Cormorant, great crested grebe, pochard, tufted duck
5	0	160	0					
6	2	46	0					
7	0	33	0					
8	9	64	3	1	2			Tufted duck
9	0	49	0					
10	0	53	0					

* Low cloud/fog limiting visibility. Also planes taking off using the northern runway, therefore any overhead waterbodies are at greater altitude

Table D1.20 Summary of aircraft overflights and resulting disturbance responses for Colne Mere 2017-2018

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses				Species Effected
				2	3	4	5	
1	12	181	0					
2	0	65	0					
3	8	133	0					
4	0	63	0					
5	9	56	0					
6	8	72	1		1			Pochard
7	0	137	0					
8	0	302	0					
9	14	32	0					
10	29	28	2	2				Goosander
11	5	37	1		1			Goosander
12	11	52	0					
13	11	113	0					
14	9	89	0					

Table D1.21 Summary of aircraft overflights and resulting disturbance responses for Staines Reservoir North 2016-2017

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses				Species Effected
				2	3	4	5	
1	0	288	0					
2	0	263	1				1	Tufted Duck
3	0*	49	0					
4	70**	417	3				3	Tufted duck, Great crested grebe
5	0	561	0					
6	0	335	0					
7	0	266	0					
8	80**	68	0					
9	0	291	0					
10	96**	46	0					

* Low cloud/fog limiting visibility. Also planes taking off using the northern runway, therefore any overhead waterbodies are at greater altitude

** Number of planes estimated from webtrack

Table D1.22 Summary of aircraft overflights and resulting disturbance responses for Staines Reservoir North 2017-2018

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses				Species Effected
				2	3	4	5	
1	0	450	0					
2	0	727	0					
3	0	404	0					
4	1	250	1	1				Tufted duck
5	0	387	0					
6	0	284	0					
7	0	341	0					
8	0	347	0					
9	0	374	0					
10	0	416	1	1				Pochard
11	0	252	0					
12	0	139	0					
13	0	270	0					
14	0	194	0					

Table D1.23 Summary of aircraft overflights and resulting disturbance responses for Staines Reservoir South 2016-2017

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses			
				2	3	4	5
1	2	85	0				
2	1	181	0				
3	0	280	0				
4	0	340	0				
5	0	719	0				
6	0	149	0				
7	0	211	0				
8	0	139	0				
9	0	410	0				
10	0	23	0				

Table D1.24 Summary of aircraft overflights and resulting disturbance responses for Staines Reservoir South 2017-2018

Visit	Number of Aircraft	Maximum Waterfowl Count	Number of aircraft causing a disturbance	Disturbance Responses			
				2	3	4	5
1	0	578	0				
2	0	282	0				
3	0	506	0				
4	1	507	0				
5	0	185	0				
6	0	218	0				
7	0	61	0				
8	0	309	0				
9	0	78	0				
10	0	138	0				
11	0	161	0				
12	0	188	0				
13	0	203	0				
14	0	170	0				

Table D1.25: Non- Aircraft disturbance records from Queen Mother Reservoir 2016/17

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
11/11/2016	1	20161111_1_QMR_1	12.13	Walker	Two TW staff outside of vehicle	TU	22	-	-	-	-	1
11/11/2016	1	20161111_1_QMR_1	12.13	Walker	Two TW staff outside of vehicle	CA	248	-	-	-	-	1
11/11/2016	1	20161111_1_QMR_1	12.13	Walker	Two TW staff outside of vehicle	GN	1	-	-	-	-	1
11/11/2016	1	20161111_1_QMR_1	12.13	Walker	Two TW staff outside of vehicle	GG	1	-	-	-	-	1
11/11/2016	1	20161111_1_QMR_2	12.35	Boat	Slow sailing boat	TU	22	-	-	-	-	1
11/11/2016	1	20161111_1_QMR_2	12.35	Boat	Slow sailing boat	CA	248	-	-	-	-	1
11/11/2016	1	20161111_1_QMR_2	12.35	Boat	Slow sailing boat	GN	1	-	-	-	-	1
11/11/2016	1	20161111_1_QMR_2	12.35	Boat	Slow sailing boat	GG	1	-	-	-	-	1
11/11/2016	1	20161111_1_QMR_3	12.42	Unknown	Unknown disturbance	CA	28	-	-	-	60	3

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
11/11/2016	1	20161111_1_QMR_3	12.42	Unknown	Unknown disturbance	TU	6	-	-	-	60	3
11/11/2016	1	20161111_1_QMR_4	13.13	Boat		TU	2	-	-	-	-	4
11/11/2016	1	20161111_1_QMR_4	13.13	Boat		CA	225	-	-	-	-	5
11/11/2016	1	20161111_1_QMR_4	13.13	Boat		TU	14	-	-	-	-	3
11/11/2016	1	20161111_1_QMR_5	13.50	Predator	Red Kite over	TU	3	-	-	-	-	3
11/11/2016	1	20161111_1_QMR_5	14.05	Vehicle	Vehicle along bank	TU	2	-	-	-	-	5
17/01/2017	5	20170117_5_QMR_1	13.56	Walker	3 TW Staff outside of vehicle then walking along pier	TU	12	-	-	-	-	1
17/01/2017	5	20170117_5_QMR_1	13.56	Walker	3 TW Staff outside of vehicle then walking along pier	GG	9	-	-	-	-	1
17/01/2017	5	20170117_5_QMR_1	13.56	Walker	3 TW Staff outside of vehicle then	CA	1	-	-	-	-	1

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
					walking along pier							
17/01/2017	5	20170117_5_QMR_1	13.56	Walker	3 TW Staff outside of vehicle then walking along pier	GN	1	-	-	-	-	1
17/01/2017	5	20170117_5_QMR_2	14.21	Walker	workers back to vehicle then back along bank	TU	12	-	-	-	-	1
17/01/2017	5	20170117_5_QMR_2	14.21	Walker	workers back to vehicle then back along bank	GG	9	-	-	-	-	1
17/01/2017	5	20170117_5_QMR_2	14.21	Walker	workers back to vehicle then back along bank	CA	1	-	-	-	-	1
17/01/2017	5	20170117_5_QMR_2	14.21	Walker	workers back to vehicle then back along bank	GN	1	-	-	-	-	1

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
17/01/2017	5	20170117_5_QMR_4	14.46	Walker	TW staff outside of vehicle walked out to peir	TU	12	-	-	-	-	1
17/01/2017	5	20170117_5_QMR_4	14.46	Walker	TW staff outside of vehicle walked out to peir	GG	9	-	-	-	-	1
17/01/2017	5	20170117_5_QMR_4	14.46	Walker	TW staff outside of vehicle walked out to peir	CA	1	-	-	-	-	1
17/01/2017	5	20170117_5_QMR_4	14.46	Walker	TW staff outside of vehicle walked out to peir	GN	1	-	-	-	-	1
08/02/2017	7	20170208_7_QMR_1	14.05	Vehicle (with on shore presence)	Staff vehicle plus operations on shore	TU	7	-	-	-	-	1
08/02/2017	7	20170208_7_QMR_2	14.23	Boat	Sailing boat launched &	TU	9	200	-	-	-	1

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
					doing circuits							
08/02/2017	7	20170208_7_QMR_3	14.30	Boat	2 Sail boat and power boat launched	TU	12	200	-	-	-	1
08/02/2017	7	20170208_7_QMR_4	14.45	Boat	Another boat launched - power boat launched	TU	12	200	-	-	420	3
08/02/2017	7	20170208_7_QMR_5	14.50	Boat	5 sailing boats	TU	12	200	-	-	120	3
28/02/2017	8	20170228_8_QMR_1	14.16	Predator	Two Red Kites over	TU	4	-	-	-	-	1
01/03/2017	9	20170301_9_QMR_1	13.40	Vehicle (with on shore presence)	Vehicle arriving at start point	TU	7	50	-	-	-	1
01/03/2017	9	20170301_9_QMR_2	14.09	Boat	2 sailing boats and 1 power boat	TU	7	250	-	-	-	1
01/03/2017	9	20170301_9_QMR_3	14.18	Boat	2 more boats launched	TU	7	250	-	-	-	1

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
01/03/2017	9	20170301_9_QMR_4	14.34	Boat	Another sailing boat launched	TU	7	150	-	100	20	3
01/03/2017	9	20170301_9_QMR_5	15.08	Predator	H. flew in and flushed birds	TU	7	50	30	>500	-	5

Table D1.26 Non- Aircraft disturbance records from Queen Mother Reservoir 2017/18

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
13/09/2017	1	20170913_1_QMR_1	13:00	Vehicle	Surveyor driving on to reservoir side	TU	118	-	-	-	-	1
13/09/2017	1	20170913_1_QMR_1	13:00	Vehicle	Surveyor driving on to reservoir side	CA	8	-	-	-	-	1
13/09/2017	1	20170913_1_QMR_1	13:00	Vehicle	Surveyor driving on to reservoir side	GG	29	-	-	-	-	1
13/09/2017	1	20170913_1_QMR_2	13:00	Boat	Windsurfer active for 15 minutes in NE of reservoir - more than 1km from main bird concentrations	TU	118	-	-	-	-	1
13/09/2017	1	20170913_1_QMR_2	13:00	Boat	Windsurfer active for 15 minutes in NE of reservoir - more than 1km from main bird concentrations	CA	8	-	-	-	-	1
13/09/2017	1	20170913_1_QMR_2	13:00	Boat	Windsurfer active for 15 minutes in NE of reservoir - more than 1km from main bird concentrations	GG	29	-	-	-	-	1
26/09/2017	2	20170926_2_QMR_1	13:25	Vehicle	Surveyor driving on to reservoir side	TU	66	50	-	10	10	3
26/09/2017	2	20170926_2_QMR_1	13:25	Vehicle	Surveyor driving on to reservoir side	CA	16	50	-	10	10	3

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
26/09/2017	2	20170926_2_QMR_1	13:25	Vehicle	Surveyor driving on to reservoir side	GG	3	50	-	10	10	3
26/09/2017	2	20170926_2_QMR_2	14:32	Predator	KT hover directly over Group 1	TU	66	10	-	-	-	1
26/09/2017	2	20170926_2_QMR_2	14:32	Predator	KT hover directly over Group 1	CA	16	10	-	-	-	1
26/09/2017	2	20170926_2_QMR_2	14:32	Predator	KT hover directly over Group 1	GG	3	10	-	-	-	1
26/09/2017	2	20170926_2_QMR_3	15:25	Vehicle	Surveyor driving away from reservoir	TU	104	30-300	-	-	-	1
26/09/2017	2	20170926_2_QMR_3	15:25	Vehicle	Surveyor driving away from reservoir	CA	545	30-300	-	-	-	1
26/09/2017	2	20170926_2_QMR_3	15:25	Vehicle	Surveyor driving away from reservoir	GG	58	30-300	-	-	-	1
03/10/2017	3	20171003_3_QMR_1	14:00	Vehicle	Surveyor driving on to reservoir side	TU	4	400	-	-	-	1
03/10/2017	3	20171003_3_QMR_1	14:00	Vehicle	Surveyor driving on to reservoir side	CA	386	400	-	-	-	1
03/10/2017	3	20171003_3_QMR_2	14:05	Boat	Maintenance boat returning	TU	4	300	-	-	-	1
03/10/2017	3	20171003_3_QMR_2	14:05	Boat	Maintenance boat returning	CA	386	300	-	-	-	1

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
03/10/2017	3	20171003_3_QMR_3	16:00	Vehicle	Surveyor leaving in vehicle	TU	30	100-700	-	-	-	1
03/10/2017	3	20171003_3_QMR_3	16:00	Vehicle	Surveyor leaving in vehicle	CA	386	100-700	-	-	-	1
03/10/2017	3	20171003_3_QMR_3	16:00	Vehicle	Surveyor leaving in vehicle	GG	9	100-700	-	-	-	1
18/10/2017	4	20171018_4_QMR_3	15:03	Walker	walker flushed birds	CA	22	40	45	350	60	5
18/10/2017	4	20171018_4_QMR_4	16:04	Walker	walker flushed birds	TU	6	30	35	500	120	5
01/12/2017	7	20171201_7_QMR_1	11:40	Walker	Surveyor movement flushed 1 CA	CA	1	100	40	800	60	5
01/12/2017	7	20171201_7_QMR_2	11:45	predator	KT Quartering N bank flushed 1 CA	CA	1	40	30	500	70	5
18/01/2018	10	20180118_10_QMR_2	14:15	Vehicle	Thames Valley Car driving along bank, created no disturbance for TU.	TU	2	-	-	-	-	1
15/02/2018	12	20180215_12_QMR_5	14:32	Walker	Walker (Surveyor)	CA	1	100	120	600	180	5

Table D1.27: Non- Aircraft disturbance records from Wraysbury Reservoir 2016/17

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
22/11/2016	2	20161122_2_WRY_1	12:20	Walker		TU	7	-	-	-	-	3
22/11/2016	2	20161122_2_WRY_2	12:22	Vehicle	Vehicle down to W Pier	TU	7	-	-	-	-	1
22/11/2016	2	20161122_2_WRY_3	12:25	Predator	PE flushed birds to the water	TU	7	-	-	-	120	3
22/11/2016	2	20161122_2_WRY_4	12:33	Boat	Maintenance boat with 2 passengers from barge in south to south shoreline	TU	7	-	-	-	-	1
22/11/2016	2	20161122_2_WRY_5	12:40	Vehicle	Vehicle along bank	TU	7	300	-	20	60	4
22/11/2016	2	20161122_2_WRY_6	12:43	Boat	Maintenance boat with 2 passengers from barge in south to south shoreline	TU	7	-	-	-	-	1
13/12/2016	4	20161213_4_WRY_1	11:09	Boat with on shore presence	1 boat with four people observing from the shore	PO	1	-	-	-	-	1
13/12/2016	4	20161213_4_WRY_1	11:09	Boat with on shore presence	1 boat with four people observing from the shore	GN	1	-	-	-	-	1
13/12/2016	4	20161213_4_WRY_1	11:09	Boat with on shore presence	1 boat with four people observing from the shore	TU	6	-	-	-	-	1

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
13/12/2016	4	20161213_4_WRY_1	11:09	Boat with on shore presence	1 boat with four people observing from the shore	GG	3	-	-	-	-	1
17/01/2017	5	20170117_5_WRY_1	11:41	Boat with on shore presence	Boat plus three people walking into lab in centre of res	TU	5	-	-	-	-	1
17/01/2017	5	20170117_5_WRY_2	12:06	Walker	Walked up to waters edge till 12.09	TU	5	-	-	-	-	1
17/01/2017	5	20170117_5_WRY_3	12:11	Boat with on shore presence	Boat from lab to shore 1 on board met another person	TU	5	-	-	-	-	1
17/01/2017	5	20170117_5_WRY_4	12:21	Boat with on shore presence	2 workers packing up boat with equipment then back to lab	TU	5	-	-	-	-	1
17/01/2017	5	20170117_5_WRY_5	12:37	Boat with on shore presence	Boat ferrying staff to lab	TU	5	-	-	-	-	1
31/01/2017	6	20170131_6_WRY_1	11:37	Predator	PE flew from concrete structure	TU	3	-	-	-	-	1
31/01/2017	6	20170131_6_WRY_1	11:37	Predator		CA	5	-	-	-	-	1
31/01/2017	6	20170131_6_WRY_1	11:37	Predator		GG	4	-	-	-	-	1

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
31/01/2017	6	20170131_6_WRY_2	11:56	Boat with on shore presence	from lab to shore	TU	3	50	-	-	10	2
31/01/2017	6	20170131_6_WRY_3	12:14	Boat with on shore presence	from shore to lab	TU	2	75	-	-	-	1
31/01/2017	6	20170131_6_WRY_4	12:55	Boat with on shore presence	from lab to shore	TU	2	150	-	-	-	1
31/01/2017	6	20170131_6_WRY_5	13:01	Boat with on shore presence	from shore to lab	TU	2	200	-	-	-	1
08/02/2017	7	20170208_7_WRY_1	10:49	Walker	Thames water employee along shore	GN	4	20	-	10	30	3
28/02/2017	8	20170228_8_WRY_1	11:25	Walker	Van with worker	GG	1	-	-	-	-	1
28/02/2017	8	20170228_8_WRY_2	11:41	Boat with on shore presence	Boat from lab came to shore to meet person in van	GG	1	-	-	-	-	1
28/02/2017	8	20170228_8_WRY_2	11:41	Boat with on shore presence	Boat from lab came to shore to meet person in van	GD	2	-	-	-	-	1
28/02/2017	8	20170228_8_WRY_3	11:53	Boat with on shore presence	Boat returned to obs	GG	1	-	-	-	-	1

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
28/02/2017	8	20170228_8_WRY_3	11:53	Boat with on shore presence	Boat returned to obs	GD	2	-	-	-	-	1
28/02/2017	8	20170228_8_WRY_4	12:39	Boat with on shore presence	Boat from lab to shore	GG	1	-	-	-	-	1
28/02/2017	8	20170228_8_WRY_4	12:39	Boat with on shore presence	Boat from lab to shore	GD	2	-	-	-	-	1
28/02/2017	8	20170228_8_WRY_5	12:49	Boat with on shore presence	Boat from short to lab	GG	1	-	-	-	-	1
28/02/2017	8	20170228_8_WRY_5	12:49	Boat with on shore presence	Boat from short to lab	GD	3	-	-	-	-	1
01/03/2017	9	20170301_9_WRY_1	11:15	Walker	Surveyor arriving at site	GG	7	200	-	-	-	1
01/03/2017	9	20170301_9_WRY_2	11:16	Swimmers	7 people swimming/water safety training at southern end of res	GG	7	500	-	-	-	1
01/03/2017	9	20170301_9_WRY_3	11:30	Predator	PE low over reservoir	GG	7	50	-	-	-	1

Table D1.28 non-aircraft disturbance records from Wraysbury Reservoir 2017/18

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
13/09/2017	1	20170913_1_WRY_1	10:30	Walker	Surveyor arrives	TU	157	-	-	-	-	1
13/09/2017	1	20170913_1_WRY_1	10:30	Walker	Surveyor arrives	GG	20	-	-	-	-	1
26/09/2017	2	20170926_2_WRY_1	10:50	Walker	Surveyor arrived	TU	41	200-500	-	-	-	1
26/09/2017	2	20170926_2_WRY_1	10:50	Walker	Surveyor arrived	GG	4	200-500	-	-	-	1
26/09/2017	2	20170926_2_WRY_3	12:49	Walker	Thames Water worker	TU	24	150	-	-	-	1
26/09/2017	2	20170926_2_WRY_3	12:49	Walker	Thames Water worker	GG	2	150	-	-	-	1
26/09/2017	2	20170926_2_WRY_5	12:55	Walker	Surveyor leaving	TU	64	150	-	-	-	1
26/09/2017	2	20170926_2_WRY_5	12:55	Walker	Surveyor leaving	GG	3	150	-	-	-	1
03/10/2017	3	20171003_3_WRY_1	11:20	Walker	Surveyor arrived	TU	13	50	-	50	60	3
03/10/2017	3	20171003_3_WRY_4	11:44	Boat	Boat looping lake	TU	36	150	-	50	60	3
13/12/2017	8	20171213_8_WRY_1	13:13	Walker	Person walking along bank	TU	10	200	-	-	-	3
13/12/2017	8	20171213_8_WRY_2	13:15	Walker	Same person further along bank	TU	18	200	-	-	-	1
05/01/2018	9	20180105_9_WRY_3	11:00	Walker	alert to surveyor	TU	2	-	-	-	-	2

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
05/01/2018	9	20180105_9_WRY_4	11:00	Predator	red kite flying low over water	TU	2	30	60	-	60	1
18/01/2018	10	20180118_10_WRY_1	12:00	Boat	Thames Water Boat on Reservoir	GD	1	-	180	450	240	3
15/02/2018	12	20180215_12_WRY_1	12:30	Walker	Surveyors arrive	TU	6	40	30	40	30	3
15/02/2018	12	20180215_12_WRY_2	12:57	Predator	TU watching Kites	TU	6	20	-	0	30	2
15/02/2018	12	20180215_12_WRY_3	13:03	Vehicle	Vehicle driving along bank	TU	6	30	30	40	30	3
15/02/2018	12	20180215_12_WRY_4	13:18	Vehicle	Vehicle driving along bank	CA	12	60	40	250	-	5
08/03/2018	13	20180308_13_WRY_2	12:30	Walker	GN flusher when surveyor arrived	GN	2	50	10	40	40	4
13/03/2018	14	20180313_14_WRY_2	14:00	Walker	TW man walking south	GN	4	100	20	-	45	3

Table D1.29 Non- Aircraft disturbance records from King George VI Reservoir 2016/17

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
01/03/2017	9	20170301_9_KGR_1	08:45	Vehicle (with on shore presence)	Thames water engineer drover around bank	TU	29	50	-	-	-	1
01/03/2017	9	20170301_9_KGR_4	09:45	Predator	PE low over reservoir	TU	29	100	-	-	20	2
01/03/2017	9	20170301_9_KGR_5	10:04	Predator	KT low over reservoir	TU	29	50	-	-	-	1
27/03/2017	10	20170327_10_KGR_1	11:16	Vehicle (with on shore presence)	Two TW staff arriving in vehicle then accessing pier	TU	3	150	-	-	-	5

Table D1.30 Non-aircraft disturbance records from King George VI Reservoir 2017/18

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
13/09/2017	1	20170913_1_KGR_1	08:00	Walker	Surveyor arrives	TU	257	-	-	-	-	1
13/09/2017	1	20170913_1_KGR_1	08:00	Walker	Surveyor arrives	CA	353	-	-	-	-	1
13/09/2017	1	20170913_1_KGR_1	08:00	Walker	Surveyor arrives	GG	14	-	-	-	-	1
13/09/2017	1	20170913_1_KGR_1	08:00	Walker	Surveyor arrives	GA	2	-	-	-	-	1
26/09/2017	2	20170926_2_KGR_1	08:20	Walker	Surveyor arrived	TU	38	150	10	30	90	3
26/09/2017	2	20170926_2_KGR_1	08:20	Walker	Surveyor arrived	GG	4	150	10	30	90	3
26/09/2017	2	20170926_2_KGR_1	08:20	Walker	Surveyor arrived	GN	2	150	10	30	90	3
26/09/2017	2	20170926_2_KGR_2	10:20	Walker	Surveyor leaving	TU	14	100	10	20	20	3
26/09/2017	2	20170926_2_KGR_2	10:20	Walker	Surveyor leaving	GG	1	100	10	20	20	3
03/10/2017	3	20171003_3_KGR_1	08:45	Walker	Surveyor arrived	TU	54	150-300	-	-	-	1
03/10/2017	3	20171003_3_KGR_1	08:45	Walker	Surveyor arrived	GG	2	150-300	-	-	-	1
03/10/2017	3	20171003_3_KGR_2	09:10	Walker	Grass mower behind fence	TU	26	100		50	120	3
03/10/2017	3	20171003_3_KGR_3	10:30	Walker	Thames Water Man	TU	28	50	-	-	20	2
03/10/2017	3	20171003_3_KGR_3	10:30	Walker	Thames Water Man	GG	2	50	-	-	20	2
03/10/2017	3	20171003_3_KGR_4	10:41	Vehicle	TW vehicle onto bank and then north	TU	17	100	60	50	60	3

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
03/10/2017	3	20171003_3_KGR_5	11:00	Walker	Surveyor leaving	TU	79	150-300	-	-	-	1
03/10/2017	3	20171003_3_KGR_5	11:00	Walker	Surveyor leaving	GG	22	150-300	-	-	-	1
18/10/2017	4	20171018_4_KGR_1	10:30	Walker	Surveyor arriving	GG	1	20	20	20	20	3
07/11/2017	5	20171107_5_KGR_1	08:45	Unknown	Unknown. Plane normal height and sound. .	TU	245	-	60	50	360	5
07/11/2017	5	20171107_5_KGR_2	08:45	Unknown	No sign of predator or human. Other flock not disturbed	TU	253	-	60	600	-	5
21/11/2017	6	20171121_6_KGR_2	10:57	Predator	Adult female PE mobbing SE over water	TU	213	50-100	-	50	120	3
01/12/2017	7	20171201_7_KGR_1	15:03	Walker	Surveyor movement flushed 4TU and 5 MA (surveyor leaving site)	TU	4	50	90	1000	180	5
13/12/2017	8	20171213_8_KGR_1	09:00	Walker	Birds unaffected by surveyor approaching	TU	6	-	-	-	-	1
13/12/2017	8	20171213_8_KGR_2	11:30	Walker	Thames Water. Part of flock disturbed, others not.	TU	10	200	60	150	60	3
13/12/2017	8	20171213_8_KGR_2	11:30	Walker	Thames Water. Part of flock disturbed, others not.	TU	35	200	-	-	-	1
13/12/2017	8	20171213_8_KGR_2	11:30	Walker	Thames Water. Part of flock disturbed, others not.	GG	1	200	-	-	-	1
05/01/2018	9	20180105_9_KGR_2	09:15	Predator	Low flying red kite	TU		-	-	-	-	1
08/03/2018	13	20180308_13_KGR_1	10:35	Predator	KT flew < 10m over GN. GN undisturbed	GN	2	-	-	-	-	1

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
13/03/2018	14	20180313_14_KGR_3	10:24	Vehicle	TW Vehicles arrived	GN	1	50	-	-	-	1
13/03/2018	14	20180313_14_KGR_4	10:41	Vehicle	TW Vehicles moving north	GN	1	50	-	-	-	1

Table D1.31 Non- Aircraft disturbance records from Wraysbury II South 2016/17

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
10/11/2016	1	20161110_1_W2N_1	14.21	Boat	Dingy on water	CA	1	10	-	>300	-	5
12/12/2016	4	20161212_4_W2N_1	13.00	Unknown	Unknown but foraging group spooked	TU	50	-	-	40	30	3
18/01/2017	5	20170118_5_W2N_1	14.46	Walker	Walkers down road on other side of hedge - dist might have been coincidence	GN	3	100	-	20	20	3
22/02/2017	8	20170222_8_W2N_1	-	Predator	Red Kite dropped low over water	PO	2	10	-	20	20	3
22/02/2017	8	20170222_8_W2N_1	-	Predator	Red Kite dropped low over water	TU	15	10	-	20	20	3

Table D1.32 Non- Aircraft disturbance records from Wraysbury II South 2017/18

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
03/10/2017	3	20171003_3_W2S_2	09:35	Boat	Rowing Canoe, Birds went to WRAYS2N	TU	92	150	45	200	-	5
17/10/2017	4	20171017_4_W2S_2	10:38	Walker	alongside lake	CA	21	30	15	-	15	4
12/12/2017	8	20171212_8_W2S_1	13:10	Walker	Bird watcher	GA	8	-	-	-	10	3
04/01/2018	9	20180104_9_W2S_1	13:05	Walker	Birdwatcher	GA	6	50	5	30	10	3
06/03/2018	13	20180306_13_W2S_1	12:05	Noise	Noise from construction	GA	2	100	-	-	2	2
13/03/2018	14	20180313_14_W2S_2	12:55	Walker	Men cleaning boats	GA	2	100	-	-	10	3

Table D1.33: Non- Aircraft disturbance records from Kingsmead 2016/17

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
12/12/2016	4	20161212_4_KGM_1	08:30	Walker	Walked across bridge	GA	12	-	-	-	-	1
12/12/2016	4	20161212_4_KGM_1	08:30	Walker	Walked across bridge	GG	11	-	-	-	-	1
12/12/2016	4	20161212_4_KGM_1	08:30	Walker	Walked across bridge	TU	41	-	-	-	-	1
12/12/2016	4	20161212_4_KGM_1	08:30	Walker	Walked across bridge	CA	3	-	-	-	-	1
12/12/2016	4	20161212_4_KGM_1	08:30	Walker	Walked across bridge	PO	1	-	-	-	-	1
12/12/2016	4	20161212_4_KGM_2	09:25	Vehicle	Tractor in field on NW side of lake	TU	10	20	-	20	45	3
12/12/2016	4	20161212_4_KGM_3	09:40	Vehicle	Tractor in field on NW side of lake	TU	7	20	-	30	30	3
18/01/2017	5	20170118_5_KGM_1	11:56	Walker with Dog	Walking south - ducks on lake all too far away	TU	30	-	-	-	-	1

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
18/01/2017	5	20170118_5_KGM_1	11:56	Walker with Dog	Walking south - ducks on lake all too far away	PO	6	-	-	-	-	1
18/01/2017	5	20170118_5_KGM_1	11:56	Walker with Dog	Walking south - ducks on lake all too far away	CA	3	-	-	-	-	1
18/01/2017	5	20170118_5_KGM_1	11:56	Walker with Dog	Walking south - ducks on lake all too far away	GA	68	-	-	-	-	1
18/01/2017	5	20170118_5_KGM_1	11:56	Walker with Dog	Walking south - ducks on lake all too far away	GG	19	-	-	-	-	1
18/01/2017	5	20170118_5_KGM_2	-	Walker with Dog	Same walker returning	TU	30	-	-	-	-	1
18/01/2017	5	20170118_5_KGM_2	-	Walker with Dog	Same walker returning	PO	6	-	-	-	-	1
18/01/2017	5	20170118_5_KGM_2	-	Walker with Dog	Same walker returning	CA	3	-	-	-	-	1
18/01/2017	5	20170118_5_KGM_2	-	Walker with Dog	Same walker returning	GA	68	-	-	-	-	1
18/01/2017	5	20170118_5_KGM_2	-	Walker with Dog	Same walker returning	GG	19	-	-	-	-	1

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
18/01/2017	5	20170118_5_KGM_3	-	Walker with Dog	Same walker with a different dog	TU	30	-	-	-	-	1
18/01/2017	5	20170118_5_KGM_3	-	Walker with Dog	Same walker with a different dog	PO	6	-	-	-	-	1
18/01/2017	5	20170118_5_KGM_3	-	Walker with Dog	Same walker with a different dog	CA	3	-	-	-	-	1
18/01/2017	5	20170118_5_KGM_3	-	Walker with Dog	Same walker with a different dog	GA	68	-	-	-	-	1
18/01/2017	5	20170118_5_KGM_3	-	Walker with Dog	Same walker with a different dog	GG	19	-	-	-	-	1

Table D1.34 Non-aircraft disturbance records from Kingsmead 2017/18

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
26/09/2017	2	20170926_2_KGM_1	12:20	Boat	Single man engine boat crossed lake	TU	2	20	30	-	600	5
17/10/2017	4	20171017_4_KGM_1	12:31	Train	Flushed by train	CA	1	50-100	20	-	20	4
06/11/2017	5	20171106_5_KGM_6	09:50	Boat	Man on boat with dog CA5 F left area	CA	5	600	60	800	-	5
06/11/2017	5	20171106_5_KGM_6	09:50	Boat	Man on boat with dog flushed left or ea	GA	15	-	60	800	-	5
06/11/2017	5	20171106_5_KGM_7	09:58	Boat	Man on boat with dog GG5f pushed south remaining on water	GG	5	200	120	300	300	3
06/11/2017	5	20171106_5_KGM_8	10:05	Boat	Fisherman on boat. GG 5f pushed north	GG	5	300	180	500	300	3
21/11/2017	6	20171121_6_KGM_1	09:40	Predator	BZ flew in ducks flushed off	GG	11	200	>60		480	3
21/11/2017	6	20171121_6_KGM_1	09:40	Predator	BZ flew in ducks flushed off	GA	40	200	>60		480	3
21/11/2017	6	20171121_6_KGM_1	09:40	Predator	BZ flew in ducks flushed off	GA	30	200	>60		480	5
21/11/2017	6	20171121_6_KGM_1	09:40	Predator	BZ flew in ducks flushed off	TU	30	200	>60		480	5
21/11/2017	6	20171121_6_KGM_2	10:15	Walker	Flushed when surveyors arrive	GA	6	40	20	150	60	5

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
21/11/2017	6	20171121_6_KGM_3	10:15	Walker	Flushed when surveyors arrive	TU	18	40	120	100	120	3
01/12/2017	7	20171201_7_KGM_1	12:30	Shooting	Shooting close to waterbody	GA	27	-	-	-	-	5
01/12/2017	7	20171201_7_KGM_1	12:30	Shooting	Shooting close to waterbody	TU	10	-	-	-	-	5
01/12/2017	7	20171201_7_KGM_1	12:30	Shooting	Shooting close to waterbody	SV	6	-	-	-	-	5
16/01/2018	10	20180116_10_KGM_2	12:40	Walker	2 men with air rifles	GA	4	40	-	-	25	3

Table D1.35 Non- Aircraft disturbance records from Wraysbury I North (2016/17)

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
10/11/2016	1	20161110_1_W1N_1	10:41	Boat	Dingy with outboard	TU	32	250	30	1	-	5
22/11/2016	2	20161122_2_W1N_1	09:55	Walker	Walker at water's edged flushed 8 Gadwell	GA	8	30	7	200	3	4
17/01/2017	5	20170117_5_W1N_4	12:25	Unknown	Unknown	TU	20	<5	-	25	15	3
17/01/2017	5	20170117_5_W1N_4	12:25	Unknown	Unknown	GA	4	<5	-	25	15	3
23/02/2017	8	20170223_8_W1N_1	-	Walker with Dog	Two anglers and two dogs walking around lake	GA	1	10	10	100	15	5
01/03/2017	9	20170301_9_W1N_2	12:55	Predator	CA unsettled TU	TU	2	0	-	-	-	3

Table D1.36: Non- Aircraft disturbance records from Wraysbury I North (2017/18)

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
26/09/2017	2	20170926_2_W1N_1	13:20	Dog	Barking Dog, no sighting	GG	1	100	-	-	90	2
26/09/2017	2	20170926_2_W1N_2	13:24	Fisherman	Fisherman Casting rod	GG	1	50	-	-	20	2
21/11/2017	6	20171121_6_W1N_1	11:00	Noise	Chainsaw close to shore	TU	47	50	-	-	30	3
21/11/2017	6	20171121_6_W1N_1	11:00	Noise	Chainsaw close to shore	GN	2	50	-	-	30	3
21/11/2017	6	20171121_6_W1N_2	12:45	Walker	loud walker on phone	GA	2	50	30	-	?	5
12/12/2017	8	20171212_8_W1N_1	12:42	Walker and Dog	alongside lake	GA	4	-	-	-	-	1
12/12/2017	8	20171212_8_W1N_1	12:42	Walker and Dog	alongside lake	TU	61	-	-	-	-	1
08/03/2018	13	20180308_13_W1N_1	10:59	Walker	Walking along bank of lake	GD	4	50	-	-	10	2
08/03/2018	13	20180308_13_W1N_1	10:59	Walker	Walking along bank of lake	GA	4	50	-	-	10	2
08/03/2018	13	20180308_13_W1N_2	11:38	Fisherman	Casting Rod	TU	29	30	-	-	30	3
13/03/2018	14	20180313_14_W1N_4	14:30	Train	Used horn as passing	GA	2	-	-	-	10	2
13/03/2018	14	20180313_14_W1N_6	14:58	Dog	Unseen barking dog	CA	1	-	20	-	20	4
13/03/2018	14	20180313_14_W1N_7	15:05	Other	CA chasing GG	GG	1	0	30	-	30	4

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
13/03/2018	14	20180313_14_W1N_8	15:16	Other	GD chasing TU	TU	3	0	10	-	30	4

Table D1.37 Non- Aircraft disturbance records from Wraysbury I South 2016/17

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
27/01/2017	6	20170127_6_W1S_1	13:35	Boat	Two men in a small rib	GA	10	20	30	200	60	5
27/01/2017	6	20170127_6_W1S_1	13:35	Boat	Two men in a small rib	TU	300	20	30	200	60	5
27/01/2017	6	20170127_6_W1S_1	13:35	Boat	Two men in a small rib	GN	2	20	30	200	60	5
27/01/2017	6	20170127_6_W1S_2	14:35	Boat	Man in a small rib	TU	150	50	30	200	60	5

Table D1.38: Non- Aircraft disturbance records from Wraysbury I South 2017/18

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
21/11/2017	6	20171121_6_W1S_1	13:15	Dog	Dogs barking at fisherman	GN	1	50	-		20	3
21/11/2017	6	20171121_6_W1S_1	13:15	Dog	Dogs barking at fisherman	TU	4	50	-	-	20	3
21/11/2017	6	20171121_6_W1S_2	13:45	Train	Train disturbed CA	CA	1	100	-	20	2	5
21/11/2017	6	20171121_6_W1S_3	14:05	Walker	Man whistling and shouting	GA	1	100	-	10+	-	5

Table D1.39 Non- Aircraft disturbance records from Wraysbury II North 2016/17

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
22/11/2016	2	20161122_2_W2N_1	14.00	Walker	Walker flushed 3 CA within the lake	CA	3	20	6	400	3	4
14/12/2016	4	20161214_4_W2N_1	09.30	Walker with Dog	Lady with dog along footpath	GG	1	15	-	50	30	4
14/12/2016	4	20161214_4_W2N_1	09.30	Walker with Dog	Lady with dog along footpath	TU	3	15	-	75	45	3
08/02/2017	7	20170208_7_W2N_1	10.40	Walker with Dog	Dog walker	PO	16	-	-	-	-	1
08/02/2017	7	20170208_7_W2N_1	10.40	Walker with Dog	Dog walker	TU	18	-	-	-	-	1
08/02/2017	7	20170208_7_W2N_1	10.40	Walker with Dog	Dog walker	GN	4	-	-	-	-	1
08/02/2017	7	20170208_7_W2N_1	10.40	Walker with Dog	Dog walker	GG	6	-	-	-	-	1
08/02/2017	7	20170208_7_W2N_1	10.40	Walker with Dog	Dog walker	CA	2	-	-	-	-	1
08/02/2017	7	20170208_7_W2N_1	10.40	Walker with Dog	Dog walker	GD	1	-	-	-	-	1

Table D1.40 Non- Aircraft disturbance records from Wraysbury II North 2017/18

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
26/09/2017	2	20170926_2_W2N_1	10:17	Noise	Loud noise from chainsaw no visible humans	TU	20	-	-	-	2	2
17/10/2017	4	20171017_4_W2N_1	08:50	Walker	Surveyors approaching	TU	58	250	180		180	3
17/10/2017	4	20171017_4_W2N_1	08:50	Walker	Surveyors approaching	PO	2	250	180		180	3
01/12/2017	7	20171201_7_W2N_1	08:40	Walker	walker by lake	GA	1	-	15	30	30	4
04/01/2018	9	20180104_9_W2N_1	08:15	Walker	Surveyor - 2 GG Dived and swam away	GG	2	30	60	100	60	3
04/01/2018	9	20180104_9_W2N_2	08:15	Walker	Surveyor - 4 TU swam away	TU	4	-	-	-	-	3
13/02/2018	12	20180213_12_W2N_1	11:20	Walker	Surveyors arrive	TU	12	50	-	-	20	3
08/03/2018	13	20180308_13_W2N_2	12:00	Walker	Surveyor arriving at vantage point	GG	1	50	20	100	120	3
08/03/2018	13	20180308_13_W2N_3	12:43	Dog off lead	Dog off lead cause GG to look and swim away and then return	GG	1	80	20	-	30	2
13/03/2018	14	20180313_14_W2N_3	12:20	Boat	Fisherman in small boat out to island - flushed most of the birds on the lake	GA	6	100	-	-	-	5
13/03/2018	14	20180313_14_W2N_3	12:20	Boat	Fisherman in small boat out to island - flushed	GG	2	>100	-	-	-	5

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
					most of the birds on the lake							
13/03/2018	14	20180313_14_W2N_3	12:20	Boat	Fisherman in small boat out to island - flushed most of the birds on the lake	TU	36	>100	-	-	-	5
13/03/2018	14	20180313_14_W2N_3	12:20	Boat	Fisherman in small boat out to island - flushed most of the birds on the lake	GG	1	>100	-	-	-	3

Table D1.41 Non- Aircraft disturbance records from Colne Mere 2016/17

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
10/11/2016	1	20161110_1_COL_2	08:13	Walker	Movement on shore	TU	1	200	5	>300	-	5
10/11/2016	1	20161110_1_COL_3	08:38	Predator	Bird spoked by overflying duck - predator response	TU	1	5	1	50	30	4
10/11/2016	1	20161110_1_COL_4	08:49	Predator	Crow overhead - predator response	TU	2	100	10	>300	-	5
10/11/2016	1	20161110_1_COL_9	09:59	Walker	Observer moving along bank	GN	1	50	-	50	30	3
22/11/2016	2	20161122_2_COL_3	14:14	Walker	2 people collecting water sample	GA	4	50	0	30	60	3
06/12/2016	3	20161206_3_COL_1	08:26	Walker	2 SV approached observer and flew when they noticed him	SV	2	30	5	100	-	5
06/12/2016	3	20161206_3_COL_2	08:30	Walker	3 SV flused from bank when	SV	3	20	5	100	-	5

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
					observer move							
06/12/2016	3	20161206_3_COL_3	09:29	Walker	Observer moving positiong, birds swam away from VP as he approached	PO	12	20	-	30	60	3
06/12/2016	3	20161206_3_COL_3	09:29	Walker		TU	2	20	-	30	60	3
13/12/2016	4	20161213_4_COL_2	13:27	Walker	CA approached opbserver	CA	1	40	10	40	60	4
27/03/2017	10	20170327_10_COL_1	17:51	Walker	Walker south down footpath	TU	15	50	-	25	120	3
27/03/2017	10	20170327_10_COL_1	17:51	Walker	Walker south down footpath	GN	2	50	-	25	120	3
27/03/2017	10	20170327_10_COL_2	18:13	Unknown	Loud bang - unknown source	TU	23	50	-	25	60	3

Table D1.42 Non- Aircraft disturbance records from Colne Mere 2017/18

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
14/09/2017	1	20170914_1_COL_1	13:45	Walker	Surveyor arrives	GA	10	-	-	-	-	1
14/09/2017	1	20170914_1_COL_1	13:45	Walker	Surveyor arrives	TU	104	-	-	-	-	1
14/09/2017	1	20170914_1_COL_1	13:45	Walker	Surveyor arrives	PO	1	-	-	-	-	1
14/09/2017	1	20170914_1_COL_3	15:34	Train	Train past north to south	TU	84	-	-	-	-	1
14/09/2017	1	20170914_1_COL_3	15:34	Train	Train past north to south	PO	1	-	-	-	-	1
14/09/2017	1	20170914_1_COL_3	15:34	Train	Train past north to south	GG	1	-	-	-	-	1
05/10/2017	3	20171005_3_COL_1	13:10	Walker	Surveyors arriving	TU	93	200	-	-	-	1
05/10/2017	3	20171005_3_COL_1	13:10	Walker	Surveyors arriving	PO	1	200	-	-	-	1
07/11/2017	5	20171107_5_COL_1	14:00	Train	Train passing close to lake	PO	130	-	-	-	-	1
21/11/2017	6	20171121_6_COL_1	08:20	Walker	Observer arriving to VP	SV	2	10	10	50	-	5
21/11/2017	6	20171121_6_COL_2	08:20	Predator	BZ over at tree height	TU	1	-	-	-	-	1
21/11/2017	6	20171121_6_COL_4	09:46	Predator	flew over	GA	1	3-5	-	1	2	2
21/11/2017	6	20171121_6_COL_5	10:01	Predator	BZ low over	TU	2	-	-	-	-	1
21/11/2017	6	20171121_6_COL_6	10:07	Unknown	TU flushed, short disturbance no obvious stimulus	TU	16	-	-	-	-	3

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
01/12/2017	7	20171201_7_COL_1	13:10	Walker	man walking down eastern shore	GA	4	50	2	150	-	5
01/12/2017	7	20171201_7_COL_1	13:10	Walker	man walking down eastern shore	TU	8	50	2	150	-	3
01/12/2017	7	20171201_7_COL_1	13:10	Walker	man walking down eastern shore	PO	40+	50	2	150	-	3
01/12/2017	7	20171201_7_COL_2	13:18	Unknown	large group flew away, smaller group flew around (could be walker - no visible stimulus)	PO	40+	-	-	-	-	5
01/12/2017	7	20171201_7_COL_2	13:18	Unknown	large group flew away, smaller group flew around (could be walker - no visible stimulus)	PO	20+	-	-	-	-	4
01/12/2017	7	20171201_7_COL_2	13:20	Unknown	large group flew away, smaller group flew around (could be walker - no visible stimulus)	PO	10+	-	-	-	-	5
01/12/2017	7	20171201_7_COL_3	13:40	Predator	Grey Heron flew over	TU	4	30	10	100	not seen	5
05/01/2018	9	20180105_9_COL_1	08:00	Walker	Surveyor arrived	TU	2	30	20	-	30	4
02/02/2018	11	20180202_11_COL_1	10:05	Train	Train along track adjacent to waterbody	GA	6	-	-	-	-	1
13/02/2018	12	20180213_12_COL_1	09:00	Walker	Surveyors arrive	GA	3	30	20	50	25	4
13/02/2018	12	20180213_12_COL_2	09:00	Walker	Surveyors arrive	GG	1	30	-	-	30	2

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
13/02/2018	12	20180213_12_COL_3	10:40	Train	Swimming away from train	TU	16	50	-	-	20	3
13/02/2018	12	20180213_12_COL_3	10:40	Train	Swimming away from train	GA	7	50	-	-	20	3
13/02/2018	12	20180213_12_COL_3	10:40	Train	Swimming away from train	GG	2	50	-	-	20	3
13/02/2018	12	20180213_12_COL_3	10:40	Train	Swimming away from train	PO	2	50	-	-	20	3
06/03/2018	13	20180306_13_COL_1	09:47	Train	no response	GA	20	30	-	-	-	1
09/03/2018	14	20180309_14_COL_2	09:40	Train	Train passing close to lake	GA	2	-	-	-	10	3
13/03/2018	14	20180313_14_COL_1	09:02	Dog off lead	2 Dogs off lead	GA	3	-	-	-	60	3
13/03/2018	14	20180313_14_COL_1	09:02	Dog off lead	2 Dogs off lead	TU	11	-	-	-	60	3
13/03/2018	14	20180313_14_COL_1	09:02	Dog off lead	2 Dogs off lead	GA	4	-	10	-	30	4
13/03/2018	14	20180313_14_COL_2	09:07	Dog off lead	2 Dogs off lead	CA	5	-	10	-	20	4
13/03/2018	14	20180313_14_COL_3	09:20	Dog off lead	2 Dogs off lead	SV	2	30	30	-	40	5

Table D1.43 Non- Aircraft disturbance records from Staines Reservoir North 2016/17

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
10/11/2016	1	20161110_1_STN_1	10.53	Walker	Walker on causeway	GA	3	10	0	20	10	3
10/11/2016	1	20161110_1_STN_1	10.53	Walker	Walker on causeway	TU	1	10	40	>800	-	5
10/11/2016	1	20161110_1_STN_2	10.59	Jogger	Jogger along causeway	GA	4	10	0	20	10	3
10/11/2016	1	20161110_1_STN_2	10.59	Jogger	Jogger along causeway	GA	4	30	-	-	-	1
10/11/2016	1	20161110_1_STN_3	11.40	Walker	Workers cutting trees on the SE corner or res	GA	1	50	0	10	5	3
10/11/2016	1	20161110_1_STN_3	11.40	Walker	Workers cutting trees on the SE corner or res	GN	1	50	30	>500	-	5
10/11/2016	1	20161110_1_STN_4	11.44	Walker with Dog	Walker with dog	GA	6	10	0	100	30	4
10/11/2016	1	20161110_1_STN_4	11.44	Walker with Dog	Walker with dog	TU	2	20	0	100	60	4

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
10/11/2016	1	20161110_1_STN_5	12.03	Walker	Birder on causeway	GA	2	30	-	-	-	1
10/11/2016	1	20161110_1_STN_6	12.10	Walker	Birder and Thames water worker along causeway	GA	6	20	0	50	120	3
10/11/2016	1	20161110_1_STN_6	12.10	Walker		TU	4	30	0	50	180	3
10/11/2016	1	20161110_1_STN_7	12.12	Walker	Thames Water Work only	GN	1	50	0	10	120	3
10/11/2016	1	20161110_1_STN_7	12.12	Walker		TU	2	100	5	50	20	4
10/11/2016	1	20161110_1_STN_8	12.20	Walker	Birder	GA	4	20	0	50	60	3
10/11/2016	1	20161110_1_STN_8	12.20	Walker	Birder	TU	2	20	0	50	20	3
10/11/2016	1	20161110_1_STN_8	12.20	Walker	Birder	TU	3	20	-	-	-	1
10/11/2016	1	20161110_1_STN_9	12.33	Walker	Birder	GN	2	100	0	50	60	3

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
22/11/2016	2	20161122_2_STN_1	08.25	Walker	Walker along causeway	GA	4	10	0	20	180	3
22/11/2016	2	20161122_2_STN_1	08.28	Walker	Walker along causeway	TU	8	10	0	20	180	3
22/11/2016	2	20161122_2_STN_1	08.28	Walker	Walker along causeway	GA	14	20	0	20	120	3
22/11/2016	2	20161122_2_STN_1	08.32	Walker	GA flew but landed in same place	GA	2	20	5	0	10	4
22/11/2016	2	20161122_2_STN_1	08.34	Walker		TU	4	30	-	-	30	3
22/11/2016	2	20161122_2_STN_2	08.55	Walker	GA swam close to observer	GA	14	20	-	-	20	3
22/11/2016	2	20161122_2_STN_4	09:00	Walker with Dog	Walker with dog off lead but in close control	GA	8	20	-	20	120	3
22/11/2016	2	20161122_2_STN_4	09.02	Walker with Dog	Walker with dog off lead but in close control	GA	4	20	-	-	120	3

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
22/11/2016	2	20161122_2_STN_4	09.05	Walker with Dog	Walker with dog off lead but in close control	TU	12	50	-	5	30	3
22/11/2016	2	20161122_2_STN_4	09.05	Walker with Dog	Walker with dog off lead but in close control	GN	4	50	-	5	30	3
22/11/2016	2	20161122_2_STN_4	09.07	Walker with Dog	GA further from causeway - no dist	GA	9	-	-	-	-	1
22/11/2016	2	20161122_2_STN_4	09.08	Walker with Dog	Walker with dog off lead but in close control	GA	8	20	-	5	30	3
22/11/2016	2	20161122_2_STN_5	09.18	Jogger	Jogger along far side of causeway	GA	13	25	-	10	100	3
22/11/2016	2	20161122_2_STN_5	09.20	Jogger	Jogger along far side of causeway	GA	5	25	-	10	30	3
22/11/2016	2	20161122_2_STN_5	09.29	Jogger	Jogger along far side of causeway	GN	1	25	-	10	40	3

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
22/11/2016	2	20161122_2_STN_5	09.31	Jogger	Jogger along far side of causeway	GA	13	20	-	20	35	3
22/11/2016	2	20161122_2_STN_5	09.31	Jogger	Jogger along far side of causeway	TU	38	20	-	20	35	3
22/11/2016	2	20161122_2_STN_6	09.38	Walker		GA	8	30	-	25	60	3
22/11/2016	2	20161122_2_STN_6	09.38	Walker		SV	1	30	-	25	120	3
22/11/2016	2	20161122_2_STN_6	09.42	Walker		GA	14	20	-	20	85	3
22/11/2016	2	20161122_2_STN_6	09.44	Walker		GA	5	30	-	30	70	3
22/11/2016	2	20161122_2_STN_6	09.44	Walker		TU	9	30	-	30	70	3
22/11/2016	2	20161122_2_STN_7	09.45	Jogger		GA	2	50	-	20	90	3
06/12/2016	3	20161206_3_STN_1	10.51	Walker		TU	5	40	-	20	30	3
06/12/2016	3	20161206_3_STN_1	10.51	Walker		GA	2	40	-	20	60	3

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
06/12/2016	3	20161206_3_STN_2	11.23	Walker with Dog	Joined up with TU flock, walker and puppy along central walkway	TU	1	30	-	40	90	3
06/12/2016	3	20161206_3_STN_3	12.35	Walker	Two walkers close to one another	GA	10	20-30	-	40	30	3
06/12/2016	3	20161206_3_STN_4	12.37	Walker	Two walkers close to one another	GN	1	20	-	50	45	3
06/12/2016	3	20161206_3_STN_5	12.39	Walker	Two walkers close to one another	TU	9	30	-	50	90	3
13/12/2016	4	20161213_4_STN_1	10.12	Jogger	Jogger along causeway	TU	4	20	-	10	20	3
13/12/2016	4	20161213_4_STN_1	10.15	Jogger		TU	1	30	-	30	80	3

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
13/12/2016	4	20161213_4_STN_1	10.15	Jogger		GA	1	30	-	10	60	3
13/12/2016	4	20161213_4_STN_1	10.16	Jogger		PO	14	40	-	30	80	3
13/12/2016	4	20161213_4_STN_1	10.16	Jogger		TU	18	40	-	30	80	3
13/12/2016	4	20161213_4_STN_2	10.17	Walker with Dog		TU	1	-	-	-	-	1
13/12/2016	4	20161213_4_STN_2	10.19	Walker with Dog		TU	3	20	-	20	60	3
13/12/2016	4	20161213_4_STN_2	10.19	Walker with Dog		GA	1	10	-	10	35	3
13/12/2016	4	20161213_4_STN_2	10.19	Walker with Dog		GN	1	20	-	40	120	3
13/12/2016	4	20161213_4_STN_3	10.24	Jogger		GA	1	10	-	10	35	3
13/12/2016	4	20161213_4_STN_3	10.24	Jogger		TU	5	10	-	20	40	3
13/12/2016	4	20161213_4_STN_3	10.25	Jogger		GN	2	20	-	40	120	3
13/12/2016	4	20161213_4_STN_3	10.25	Jogger		TU	8	20	-	5	20	3

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
13/12/2016	4	20161213_4_STN_3	10.25	Jogger		GN	2	20	-	10	20	3
13/12/2016	4	20161213_4_STN_4	10.28	Jogger		GN	4	20	-	20	50	3
13/12/2016	4	20161213_4_STN_5	10.32	Walker with Dog		TU	3	20	-	10	30	3
13/12/2016	4	20161213_4_STN_5	10.37	Walker with Dog		TU	3	20	-	10	20	3
13/12/2016	4	20161213_4_STN_5	10.37	Walker with Dog		GN	2	20	-	10	20	3
16/01/2017	5	20170116_5_STN_1	12.55	Jogger	Jogger at same time as man with dog	GN	2	5	-	20	75	3
16/01/2017	5	20170116_5_STN_1	12.55	Jogger		GA	4	5	-	20	75	3
16/01/2017	5	20170116_5_STN_1	12.55	Jogger		TU	8	5	-	20	75	3
16/01/2017	5	20170116_5_STN_2	13.12	Walker with Dog	Same man with do	GN	2	5	-	20	60	3
16/01/2017	5	20170116_5_STN_2	13.12	Walker with Dog		TU	6	5	-	20	60	3

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
31/01/2017	6	20170131_6_STN_1	08.29	Walker		GN	1	20	-	30	60	3
31/01/2017	6	20170131_6_STN_1	08.29	Walker		PO	4	20	-	30	60	3
31/01/2017	6	20170131_6_STN_1	08.29	Walker		TU	4	20	-	30	60	3
31/01/2017	6	20170131_6_STN_2	08.31	Walker		GA	2	20	-	40	80	3
31/01/2017	6	20170131_6_STN_2	08.31	Walker		PO	7	15	60	40	135	5
31/01/2017	6	20170131_6_STN_3	08.55	Walker		PO	3	30	-	20	80	3
31/01/2017	6	20170131_6_STN_3	08.55	Walker		GN	2	15	-	50	120	4
31/01/2017	6	20170131_6_STN_3	08.55	Walker		GA	2	30	20	80	60	5
31/01/2017	6	20170131_6_STN_4	09.01	Walker		GN	1	20	-	30	65	3
31/01/2017	6	20170131_6_STN_4	09.01	Walker		GA	2	20	-	20	65	3
31/01/2017	6	20170131_6_STN_5	09.38	Walker		GA	2	15	-	20	50	3

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
31/01/2017	6	20170131_6_STN_5	09.38	Walker		GN	1	20	-	40	100	3
09/02/2017	7	20170209_7_STN_1	13.29	Walker		GA	1	10	-	30	40	3
09/02/2017	7	20170209_7_STN_2	13.33	Walker		GA	4	20	-	20	45	3
09/02/2017	7	20170209_7_STN_3	13.42	Walker		GA	4	15	-	25	40	3
09/02/2017	7	20170209_7_STN_4	13.56	Walker		GA	7	20	-	10	160	3
09/02/2017	7	20170209_7_STN_5	14.03	Walker		TU	2	-	-	-	-	2
09/02/2017	7	20170209_7_STN_6	14.05	Walker	Ducks 20m from shore - no disturbance	GA	15	-	-	-	-	1
09/02/2017	7	20170209_7_STN_7	14.21	Walker		GA	2	15	-	20	60	3
09/02/2017	7	20170209_7_STN_8	14.31	Walker		GA	5	25	-	10	20	3
09/02/2017	7	20170209_7_STN_9	14.35	Walker		GA	7	15	-	10	20	3

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
22/02/2017	8	20170222_8_STN_1	15:00	Walker	Two birds at west end of causeway. Present from start of survey til 15.21 - birds not reacting but did move a short distance whilst they were there.	GA	15	15	-	10	50	3
22/02/2017	8	20170222_8_STN_2	16:00	Walker	Walker along causeway - E-W	GA	12	25	-	20/25	120	3
22/02/2017	8	20170222_8_STN_3	16.16	Walker	Same walkers returning	GA	12	25	-	20/25	120	3
02/03/2017	9	20170302_9_STN_1	08.10	Walker with Dog	Dog walker along path	GA	-	10	30 (Swim)	-	60	3
02/03/2017	9	20170302_9_STN_2	08.25	Walker with Dog	Dog walker along path	GA	-	10	15 (Swim)	-	30	3
02/03/2017	9	20170302_9_STN_3	09.14	Jogger	Jogger along path	GA	-	10	15 (Swim)	-	30	3

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
28/03/2017	10	20170328_10_STN_2	15.37	Walker	From east to centre bench	TU	2	15	-	1-	-	3
28/03/2017	10	20170328_10_STN_5	16.13	Walker	Walkers returning from earlier	TU	6	15	-	20	45	3
28/03/2017	10	20170328_10_STN_6	16.36	Walker	Walker east	GA	1	15	-	50	-	5
28/03/2017	10	20170328_10_STN_6	16.36	Walker	Walker east	TU	2	15	-	10	-	3
28/03/2017	10	20170328_10_STN_9	17.11	Walker with Dog	Going W	GA	4	20	-	20	-	3

Table D1.44 Non- Aircraft disturbance records from Staines Reservoir North 2017/18

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
14/09/2017	1	20170914_1_STN_1	10:15	Walker	Surveyor arrives	GA	14	-	-	-	-	1
14/09/2017	1	20170914_1_STN_1	10:15	Walker	Surveyor arrives	SV	4	-	-	-	-	1
14/09/2017	1	20170914_1_STN_1	10:15	Walker	Surveyor arrives	TU	251	-	-	-	-	1
14/09/2017	1	20170914_1_STN_1	10:15	Walker	Surveyor arrives	CA	1	-	-	-	-	1
14/09/2017	1	20170914_1_STN_1	10:15	Walker	Surveyor arrives	GG	21	-	-	-	-	1
14/09/2017	1	20170914_1_STN_1	10:15	Walker	Surveyor arrives	GN	1	-	-	-	-	1
14/09/2017	1	20170914_1_STN_2	10:20	Walker	Birdwatchers	GA	14	-	-	-	-	1
14/09/2017	1	20170914_1_STN_2	10:20	Walker	Birdwatchers	SV	4	-	-	-	-	1
14/09/2017	1	20170914_1_STN_2	10:20	Walker	Birdwatchers	TU	251	-	-	-	-	1
14/09/2017	1	20170914_1_STN_2	10:20	Walker	Birdwatchers	CA	1	-	-	-	-	1
14/09/2017	1	20170914_1_STN_2	10:20	Walker	Birdwatchers	GG	21	-	-	-	-	1
14/09/2017	1	20170914_1_STN_2	10:20	Walker	Birdwatchers	GN	1	-	-	-	-	1
14/09/2017	1	20170914_1_STN_3	10:40	Walker	Birdwatchers	GA	14	-	-	-	-	1
14/09/2017	1	20170914_1_STN_3	10:40	Walker	Birdwatchers	SV	4	-	-	-	-	1
14/09/2017	1	20170914_1_STN_3	10:40	Walker	Birdwatchers	TU	251	-	-	-	-	1

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
14/09/2017	1	20170914_1_STN_3	10:40	Walker	Birdwatchers	CA	1	-	-	-	-	1
14/09/2017	1	20170914_1_STN_3	10:40	Walker	Birdwatchers	GG	21	-	-	-	-	1
14/09/2017	1	20170914_1_STN_3	10:40	Walker	Birdwatchers	GN	1	-	-	-	-	1
14/09/2017	1	20170914_1_STN_4	11:10	Walker	Birdwatchers	GA	14	-	-	-	-	1
14/09/2017	1	20170914_1_STN_4	11:10	Walker	Birdwatchers	SV	4	-	-	-	-	1
14/09/2017	1	20170914_1_STN_4	11:10	Walker	Birdwatchers	TU	251	-	-	-	-	1
14/09/2017	1	20170914_1_STN_4	11:10	Walker	Birdwatchers	CA	1	-	-	-	-	1
14/09/2017	1	20170914_1_STN_4	11:10	Walker	Birdwatchers	GG	21	-	-	-	-	1
14/09/2017	1	20170914_1_STN_4	11:10	Walker	Birdwatchers	GN	1	-	-	-	-	1
14/09/2017	1	20170914_1_STN_5	11:17	Predator	female PE on Staines South foraging	GA	14	-	-	-	-	1
14/09/2017	1	20170914_1_STN_5	11:17	Predator	female PE on Staines South foraging	SV	4	-	-	-	-	1
14/09/2017	1	20170914_1_STN_5	11:17	Predator	female PE on Staines South foraging	TU	251	-	-	-	-	1
14/09/2017	1	20170914_1_STN_5	11:17	Predator	female PE on Staines South foraging	CA	1	-	-	-	-	1
14/09/2017	1	20170914_1_STN_5	11:17	Predator	female PE on Staines South foraging	GG	21	-	-	-	-	1

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
14/09/2017	1	20170914_1_STN_5	11:17	Predator	female PE on Staines South foraging	GN	1	-	-	-	-	1
14/09/2017	1	20170914_1_STN_6	11:48	Predator	ML on South Staines foraging	GA	14	-	-	-	-	1
14/09/2017	1	20170914_1_STN_6	11:48	Predator	ML on South Staines foraging	SV	4	-	-	-	-	1
14/09/2017	1	20170914_1_STN_6	11:48	Predator	ML on South Staines foraging	TU	251	-	-	-	-	1
14/09/2017	1	20170914_1_STN_6	11:48	Predator	ML on South Staines foraging	CA	1	-	-	-	-	1
14/09/2017	1	20170914_1_STN_6	11:48	Predator	ML on South Staines foraging	GG	21	-	-	-	-	1
14/09/2017	1	20170914_1_STN_6	11:48	Predator	ML on South Staines foraging	GN	1	-	-	-	-	1
05/10/2017	3	20171005_3_STN_1	10:15	Walker	Surveyor arriving	SV	165	-				1
05/10/2017	3	20171005_3_STN_1	10:15	Walker	Surveyor arriving	TU	111					1
05/10/2017	3	20171005_3_STN_1	10:15	Walker	Surveyor arriving	GG	9					1
05/10/2017	3	20171005_3_STN_2	10:43	Jogger	Jogger on PROW	SV	165					1
05/10/2017	3	20171005_3_STN_2	10:43	Jogger	Jogger on PROW	TU	111					1
05/10/2017	3	20171005_3_STN_2	10:43	Jogger	Jogger on PROW	GG	9					1

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
07/11/2017	5	20171107_5_STN_1	07:55	Walker and Dog	Man with dog walking west on causeway	TU	45	-	-	-	-	1
07/11/2017	5	20171107_5_STN_2	08:30	Walker and Dog	Second dog walker walking west on causeway	TU	45	-	-	-	-	1
07/11/2017	5	20171107_5_STN_3	08:35	Walker	Walker walking west on causeway	TU	45	-	-	-	-	1
21/11/2017	6	20171121_6_STN_1	13:40	Walker and Dog	Walker and dog along path	TU	1	30	-	20	30	3
21/11/2017	6	20171121_6_STN_2	14:23	Walker and Dog		GA	4	20	-	30	-	3
21/11/2017	6	20171121_6_STN_3	14:38	Cyclist		TU	1	30	-	-	20	3
21/11/2017	6	20171121_6_STN_4	14:50	Walker		TU	1	30	-	-	-	1
21/11/2017	6	20171121_6_STN_4	14:50	Walker		GG	1	30	-	-	-	1
01/12/2017	7	20171201_7_STN_1	09:15	Walker and Dog	walker with two small dogs	TU	1	50	-	100	60	3
01/12/2017	7	20171201_7_STN_1	09:15	Walker and Dog	walker with two small dogs	TU	2	-	-	-	-	1

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
01/12/2017	7	20171201_7_STN_2	09:46	walker	Bird watcher	TU	2	50	-	20	30	3
01/12/2017	7	20171201_7_STN_2	09:46	walker	Bird watcher	GG	1	-	-			2
01/12/2017	7	20171201_7_STN_3	09:54	walker	Bird watcher	TU	6	50	-	40	40	5
01/12/2017	7	20171201_7_STN_3	09:54	walker	Bird watcher	PO	2	50	-	40	40	3
01/12/2017	7	20171201_7_STN_3	09:54	walker	Bird watcher	GN	1	-	-	-	-	1
01/12/2017	7	20171201_7_STN_4	10:02	Predator	KT over path	GN	2	-	-	-	-	1
01/12/2017	7	20171201_7_STN_4	10:02	Predator	KT over path	TU	6	-	-	-	-	1
01/12/2017	7	20171201_7_STN_5	10:40	walker	2 walkers along path	GG	1	-	-	-	-	1
01/12/2017	7	20171201_7_STN_5	10:40	walker	2 walkers along path	GN	1	-	-	-	-	1
13/12/2017	8	20171213_8_STN_1	-	Vehicle		SV	20	80	20	100	120	5
13/12/2017	8	20171213_8_STN_2	-	Vehicle		SV	6	50	10	100	80	5
05/01/2018	9	20180105_9_STN_1	10:30	Walker	Surveyor arrived	PO	128	50	-	-	-	3

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
05/01/2018	9	20180105_9_STN_2	10:42	Walker	Birdwatcher	PO	126	-	-	-	-	1
05/01/2018	9	20180105_9_STN_3	10:51	Predator	Fox on bank	SV	22	100	20	-	20	4
05/01/2018	9	20180105_9_STN_4	11:26	vehicle	Vehicle along bank	PO	58	50	-	-	-	3
05/01/2018	9	20180105_9_STN_4	11:26	vehicle	Vehicle along bank	TU	52	50	-	-	-	3
05/01/2018	9	20180105_9_STN_4	11:26	vehicle	Vehicle along bank	SV	21	100	-	-	-	2
05/01/2018	9	20180105_9_STN_5	11:55	Walker	Birdwatcher	PO	56	100	30	-	30	4
18/01/2018	10	20180118_10_STN_1	11:05	Walker	Walker along path	PO	20	50	-	-	-	3
15/02/2018	12	20180215_12_STN_1	08:55	Walker and Dog	Dog & walker	TU	8	30	-	-	30	3
08/03/2018	13	20180308_13_STN_1	14:30	Dog off lead	flushed birds picked up other birds	TU	5	150	30	350	180	5
08/03/2018	13	20180308_13_STN_1	14:30	Dog off lead	flushed birds picked up other birds	SV	29	150	30	350	180	5
12/03/2018	14	20180312_14_STN_1	15:15	Walker	Walker along path	GG	1	40	-	-	10	2
12/03/2018	14	20180312_14_STN_2	16:10	Walker and dog	Walker with two dogs	GA	2	30	20	-	40	4

Table D1.45 Non- Aircraft disturbance records from Staines Reservoir South 2016/17

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
10/11/2016	1	20161110 _1_STS_1	12.57.00	Jogger	Jogger along causeway	GA	50	0	50	20	20	3
10/11/2016	1	20161110 _1_STS_2	13.06.00	Walker	Birder	GG	1	70	0	3	5	3
10/11/2016	1	20161110 _1_STS_2	13.06.00	Walker	Birder	GA	4	50	0	50	300	3
10/11/2016	1	20161110 _1_STS_2	13.06.00	Walker	Birder	SV	1	50	0	50	300	3
10/11/2016	1	20161110 _1_STS_2	13.06.00	Walker	Birder	GN	1	50	0	100	300	3
10/11/2016	1	20161110 _1_STS_2	13.06.00	Walker	Birder	BN	1	50	0	100	300	3
10/11/2016	1	20161110 _1_STS_3	13.10.00	Walker	Birder	GG	3	150	-	NA	20	2
10/11/2016	1	20161110 _1_STS_4	13.36.00	Walker	Birder	SV	1	200	0	300	-	5
10/11/2016	1	20161110 _1_STS_4	13.36.00	Walker	Birder	GA	4	200	0	50	20	3
10/11/2016	1	20161110 _1_STS_4	13.36.00	Walker	Birder	GN	4	70	3	25	10	4

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
10/11/2016	1	20161110 _1_STS_5	13.38.00	Walker with Dog	Dad with child with young dog off lead	GN	1	150	35	400	50	5
10/11/2016	1	20161110 _1_STS_5	13.38.00	Walker with Dog	Dad with child with young dog off lead	GG	1	200	0	0	20	2
10/11/2016	1	20161110 _1_STS_5	13.38.00	Walker with Dog	Dad with child with young dog off lead	GN	1	100	0	150	240	3
10/11/2016	1	20161110 _1_STS_5	13.38.00	Walker with Dog	Dad with child with young dog off lead	GA	3	100	0	100	240	3
10/11/2016	1	20161110 _1_STS_5	13.38.00	Walker with Dog	Dad with child with young dog off lead	BN	1	100	0	400	360	4
10/11/2016	1	20161110 _1_STS_6	14.06.00	Walker with Dog	Dad with child with young dog off lead	GN	1	100	10	600	15	5
10/11/2016	1	20161110 _1_STS_7	14.15.00	Walker with Dog	Dad with child with young dog off lead	GA	4	200	0	100	60	3

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
10/11/2016	1	20161110 _1_STS_7	14.15.00	Walker with Dog	Dad with child with young dog off lead	GN	2	100	0	10	20	3
10/11/2016	1	20161110 _1_STS_7	14.15.00	Walker with Dog	Dad with child with young dog off lead	GG	2	200	0	0	10	2
10/11/2016	1	20161110 _1_STS_8	14.31.00	Walker	Birder	BN	1	50	0	100	135	4
10/11/2016	1	20161110 _1_STS_8	14.31.00	Walker	Birder	GG	1	-	-	-	-	2
10/11/2016	1	20161110 _1_STS_9	14.41.00	Walker	Walker	GA	4	50	0	50	120	3
10/11/2016	1	20161110 _1_STS_9	14.41.00	Walker	Walker	GG	1	50	-	-	-	1
22/11/2016	2	20161122 _2_STS_1	10.35.00	Walker with Dog		GG	1	50	-	-	5	2
22/11/2016	2	20161122 _2_STS_1	10.35.00	Walker with Dog		GG	1	40	-	30	120	3
22/11/2016	2	20161122 _2_STS_2	10.39.00	Jogger		GG	1	-	-	-	-	1
22/11/2016	2	20161122 _2_STS_3	10.43.00	Jogger		GG	1	-	-	-	-	1

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
22/11/2016	2	20161122_2_STS_4	10.59.00	Jogger		BN	1	60	-	10	10	3
06/12/2016	3	20161206_3_STS_1	13.04.00	Walker	Walking along Central walkway	SV	1	30	-	40	25	3
06/12/2016	3	20161206_3_STS_1	13.04.00	Walker	Walking along Central walkway	GA	2	-	-	-	-	1
06/12/2016	3	20161206_3_STS_1	13.04.00	Walker	Walking along Central walkway	TU	5	-	-	-	-	1
06/12/2016	3	20161206_3_STS_1	13.08.00	Walker	Walking along Central walkway	GA	2	30	-	20	40	3
06/12/2016	3	20161206_3_STS_1	13.08.01	Walker	Walking along Central walkway	GG	1	-	-	5	10	3
06/12/2016	3	20161206_3_STS_2	13.20.00	Walker	Walking along Central walkway	GA	2	40	-	15	55	3
06/12/2016	3	20161206_3_STS_2	13.20.00	Walker	Walking along	BN	2	-	-	-	-	1

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
					Central walkway							
06/12/2016	3	20161206_3_STS_2	13.20.00	Walker	Walking along Central walkway	TU	5	-	-	-	-	1
06/12/2016	3	20161206_3_STS_2	13.23.00	Walker	Swam slowly away	GA	2	50	-	10	80	3
06/12/2016	3	20161206_3_STS_2	13.26.00	Walker		SV	5	30	-	20	-	3
06/12/2016	3	20161206_3_STS_2	13.26.00	Walker	CA flushed a short distance	CA	45	30	-	>400	Not seen	5
06/12/2016	3	20161206_3_STS_2	13.26.00	Walker		CA	186	20	-	>400	Not seen	5
06/12/2016	3	20161206_3_STS_3	14.06.00	Walker		GA	2	30	-	20	30	3
06/12/2016	3	20161206_3_STS_3	14.06.00	Walker		TU	5	30	-	20	30	3
06/12/2016	3	20161206_3_STS_3	14.06.00	Walker		BN	2	30	-	20	30	3
06/12/2016	3	20161206_3_STS_5	14.25.00	Walker		GA	2	20	-	10	30	3

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
06/12/2016	3	20161206 _3_STS_6	14.27.00	Walker		CA	8	50	-	>300	Not seen	5
13/12/2016	4	20161213 _4_STS_2	09.02.00	Walker	Walker along path - birds in screened area - limited disturbance	GA	6	10	-	5	10	3
13/12/2016	4	20161213 _4_STS_2	09.02.00	Walker		GG	1	10	-	5	10	3
13/12/2016	4	20161213 _4_STS_2	09.04.00	Walker		GA	3	20	-	30	100	3
13/12/2016	4	20161213 _4_STS_2	09.05.00	Walker		GA	12	20	-	30	100	3
16/01/2017	5	20170116 _5_STS_3	14.36.00	Jogger		SV	2	10	-	15	10	3
16/01/2017	5	20170116 _5_STS_3	14.36.00	Jogger		GA	2	10	-	15	10	3
16/01/2017	5	20170116 _5_STS_4	14.45.00	Jogger		SV	8	15	-	10	10	3
16/01/2017	5	20170116 _5_STS_5	14.47.00	Jogger		GA	2	20	-	5	10	3
16/01/2017	5	20170116 _5_STS_6	14.50.00	Jogger		SV	7	10	-	10	10	3

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
16/01/2017	5	20170116 _5_STS_6	14.50.00	Jogger		GA	4	10	-	10	10	3
16/01/2017	5	20170116 _5_STS_8	15.24.00	Walker with Dog		SV	10	10	20	-	15	3
16/01/2017	5	20170116 _5_STS_8	15.24.00	Walker with Dog		GA	4	10	20	-	15	3
16/01/2017	5	20170116 _5_STS_8	15.26.00	Walker with Dog		SV	9	20	10	50	15	5
16/01/2017	5	20170116 _5_STS_8	15.30.00	Walker with Dog		SV	20	20	-	25	15	3
16/01/2017	5	20170116 _5_STS_8	15.30.00	Walker with Dog		GA	2	20	-	25	15	3
31/01/2017	6	20170131 _6_STS_1	10.20.00	Walker		GA	4	20	-	15	80	3
31/01/2017	6	20170131 _6_STS_2	10.22.00	Walker		GA	2	20	-	10	100	3
31/01/2017	6	20170131 _6_STS_2	10.27.00	Walker		GA	3	10	-	15	100	3
31/01/2017	6	20170131 _6_STS_2	10.27.00	Walker		GN	1	10	-	15	100	3
31/01/2017	6	20170131 _6_STS_2	10.27.00	Walker		GA	2	10	-	10	80	3

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
31/01/2017	6	20170131 _6_STS_2	10.27.00	Walker		TU	1	15	-	10	60	3
31/01/2017	6	20170131 _6_STS_3	11.04.00	Walker		GA	3	15	-	20	90	3
31/01/2017	6	20170131 _6_STS_3	11.04.00	Walker		GA	2	20	-	20	90	3
31/01/2017	6	20170131 _6_STS_3	11.04.00	Walker		GN	1	20	-	20	120	3
31/01/2017	6	20170131 _6_STS_3	11.04.00	Walker		GA	8	25	-	15	120	3
31/01/2017	6	20170131 _6_STS_3	11.09.00	Walker		GG	1	25	-	30	95	3
31/01/2017	6	20170131 _6_STS_3	11.11.00	Walker		CA	1	15	30	40	40	4
31/01/2017	6	20170131 _6_STS_4	11.59.00	Walker		GA	2	10	-	20	30	3
31/01/2017	6	20170131 _6_STS_4	11.59.00	Walker		BN	1	20	-	20	40	3
09/02/2017	7	20170209 _7_STS_1	10.45.00	Walker		GA	4	15	-	2	40	3
09/02/2017	7	20170209 _7_STS_2	10.50.00	Walker		GA	2	20	40	<300	-	5

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
09/02/2017	7	20170209 _7_STS_3	11.14.00	Walker with Dog		GA	3	20	-	15	80	3
09/02/2017	7	20170209 _7_STS_3	11.14.00	Walker with Dog		GN	3	-	-	-	-	1
09/02/2017	7	20170209 _7_STS_4	11.20.00	Jogger		GN	3	15	-	10	20	3
09/02/2017	7	20170209 _7_STS_4	11.20.00	Jogger		GA	3	15	-	10	45	3
09/02/2017	7	20170209 _7_STS_5	11.27.00	Walker		GA	3	15	-	10	20	3
09/02/2017	7	20170209 _7_STS_6	11.34.00	Jogger		GA	2	15	-	10	30	3
09/02/2017	7	20170209 _7_STS_7	12.20.00	Walker		GA	5	15	-	10	30	3
09/02/2017	7	20170209 _7_STS_7	12.20.00	Walker		GN	3	15	-	10	20	3
09/02/2017	7	20170209 _7_STS_8	12.25.00	Walker		GA	4	15	-	20	40	3
09/02/2017	7	20170209 _7_STS_8	12.25.00	Walker		GN	3	15	-	20	40	3
22/02/2017	8	20170222 _8_STS_1	16.00.00	Walker		GA	3	20	-	10	120	3

Date	Visit Number	OBS_ID	Time	Disturbance Category	Description	Species	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
22/02/2017	8	20170222_8_STS_2	16.06.00	Walker		GA	2	40	-	10	45	3
02/03/2017	9	20170302_9_STS_1	10.55.00	Vehicle	Car along road by reservoir	GA	-	50	10 (Swim)	-	30	3
02/03/2017	9	20170302_9_STS_2	11.10.00	Vehicle	Car along edge of reservoir	SV	200	40	30	-	300	4
28/03/2017	10	20170328_10_STS_1	13.51.00	Walker	Birder at west end of causeway	TU	9	-	-	-	-	1

Table D1.46 Non- Aircraft disturbance records from Staines Reservoir South 2017/18

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
14/09/2017	1	20170914_1_STS_1	08:10	Walker	Surveyor arrives	TU	45	-	-	400	-	1
14/09/2017	1	20170914_1_STS_1	08:10	Walker	Surveyor arrives	GA	28	-	-	400	-	1
14/09/2017	1	20170914_1_STS_1	08:10	Walker	Surveyor arrives	SV	312	-	-	400	-	1
14/09/2017	1	20170914_1_STS_1	08:10	Walker	Surveyor arrives	GG	3	-	-	400	-	1
14/09/2017	1	20170914_1_STS_1	08:10	Walker	Surveyor arrives	BN	1	-	-	400	-	1
14/09/2017	1	20170914_1_STS_2	08:30	Walker and Dog	Dog walkers on path	GA	22	-	-	200	-	1
14/09/2017	1	20170914_1_STS_2	08:30	Walker and Dog	Dog walkers on path	TU	45	-	-	200	-	1
14/09/2017	1	20170914_1_STS_2	08:30	Walker and Dog	Dog walkers on path	SV	253	-	-	200	-	1
14/09/2017	1	20170914_1_STS_2	08:30	Walker and Dog	Dog walkers on path	BN	1	-	-	200	-	1
14/09/2017	1	20170914_1_STS_2	08:30	Walker and Dog	Dog walkers on path	GG	3	-	-	200	-	1
14/09/2017	1	20170914_1_STS_3	09:38	Jogger	Jogger on PROW	GA	22	-	-	-	-	1

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
14/09/2017	1	20170914_1_STS_3	09:38	Jogger	Jogger on PROW	TU	45	-	-	-	-	1
14/09/2017	1	20170914_1_STS_3	09:38	Jogger	Jogger on PROW	SV	253	-	-	-	-	1
14/09/2017	1	20170914_1_STS_3	09:38	Jogger	Jogger on PROW	BN	1	-	-	-	-	1
14/09/2017	1	20170914_1_STS_3	09:38	Jogger	Jogger on PROW	GG	3	-	-	-	-	1
14/09/2017	1	20170914_1_STS_4	10:00	Predator	GB flew over ducks	SV	110	20	15	-	45	4
14/09/2017	1	20170914_1_STS_4	10:00	Predator	GB flew over ducks	TU	90	20	15	-	45	4
14/09/2017	1	20170914_1_STS_4	10:00	Predator	GB flew over ducks	GA	15	20	15	-	45	4
05/10/2017	3	20171005_3_STS_1	08:10	Walker	Surveyor arrived	SV	238	250	-	-	-	1
05/10/2017	3	20171005_3_STS_1	08:10	Walker	Surveyor arrived	GA	6	250	-	-	-	1
05/10/2017	3	20171005_3_STS_2	09:43	Unknown	Birds moving	SV	107	250	30	500	0	5
18/10/2017	4	20171018_4_STS_1	09:02	Unknown	Unkown large event	SV	6	?	?	-	30	4
18/10/2017	4	20171018_4_STS_1	09:02	Unknown	Unkown large event	GA	6	?	?	-	30	4

Date	Visit Number	OBSID	Time	Disturbance Category	Description	Focal Species Disturbed	Count	Distance (m) at which disturbance response elicited	Time in flight (sec)	Distance Displaced (m)	Time before normal behaviour resumed (sec)	Disturbance Level
18/10/2017	4	20171018_4_STS_2	10:05	Predator	sparrowhawk	GA	1	20	10	-	20	4
18/10/2017	4	20171018_4_STS_2	10:05	Predator	sparrowhawk	SV	1	20	10	-	20	4
18/10/2017	4	20171018_4_STS_2	10:05	Predator	sparrowhawk	TU	1	20	10	-	20	4
21/11/2017	6	20171121_6_STS_1	11:35	Walker and Dog	SV flushed to opposite corner	SV	30	50	9	400	10	5
21/11/2017	6	20171121_6_STS_2	11:46	Walker and Dog		SV	6	50	-	-	-	1
21/11/2017	6	20171121_6_STS_3	13:07	walker	2 bird watchers	SV	3	50	10	200	10	5
01/12/2017	7	20171201_7_STS_1	07:55	Walker and Dog	walker with dog along path	sv	10	200	-	-	-	1
01/12/2017	7	20171201_7_STS_2	08:25	Walker and Dog	walker with dog along path	SV	10	200	-	-	-	1
12/03/2018	14	20180312_14_STS_2	13:45	Walker and Dog	2 walkers & 3 dogs	TU	8	50	-	-	20	3
12/03/2018	14	20180312_14_STS_2	13:45	Walker and Dog	2 walkers & 3 dogs	GG	2	40	-	-	-	3
12/03/2018	14	20180312_14_STS_3	14:05	Jogger	Runner	TU	4	30	-	-	10	2

ANNEX B – EUROPEAN SITE DESIGNATIONS

South West London Waterbodies SPA

EC Directive 79/409 on the Conservation of Wild Birds: Special Protection Area (SPA)

Name: South West London Waterbodies

Unitary Authority/County: London Borough of Hounslow, Royal Borough of Windsor & Maidenhead and Surrey.

Consultation proposal: Kempton Park Reservoirs Site of Special Scientific Interest (SSSI), Knight & Bessborough Reservoirs SSSI, Thorpe Park No. 1 Gravel Pit SSSI, Wraysbury No. 1 Gravel Pit SSSI, Wraysbury Reservoir SSSI, and parts of Staines Moor SSSI and Wraysbury & Hythe End Gravel Pits SSSI have been recommended as a Special Protection Area because of the site's European ornithological interest.

The South West London Waterbodies SPA comprises a series of embanked water supply reservoirs and former gravel pits that support a range of man-made and semi-natural open-water habitats.

Boundary of SPA: The SPA boundary is coincident with Kempton Park Reservoirs SSSI, Knight & Bessborough Reservoirs SSSI, Thorpe Park No. 1 Gravel Pit SSSI, Wraysbury No. 1 Gravel Pit SSSI , Wraysbury Reservoir SSSI, and includes parts of Staines Moor SSSI and Wraysbury & Hythe End Gravel Pits SSSI. See SPA map for further detail.

Size of SPA: The SPA covers an area of 828.14 ha.

European ornithological interest of SPA
South West London Waterbodies SPA is of European importance because:

a) the site qualifies under **article 4.2** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed on Annex 1), in any season:

Migratory species	5 year peak mean 1993/94 - 1997/98	% of population
Gadwall *Anas strepera*	710 individuals - wintering	2.4 % NW Europe
Shoveler *Anas clypeata*	853 individuals - wintering	2.1 % NW/Central Europe

Bird figures from WeBS database.

Non-qualifying species of interest
In addition, the site supports nationally important numbers of cormorant *Phalacrocorax carbo*, great crested grebe *Podiceps cristatus*, tufted duck *Aythya fuligula*, pochard *Aythya ferina* and coot *Fulica atra*.

Status of SPA
South West London Waterbodies was classified as a Special Protection Area on 22 September 2000.

South West London Waterbodies Ramsar site

RAMSAR INFORMATION SHEET

FOR WETLANDS OF INTERNATIONAL IMPORTANCE

Site reference number 7UK148

1 Compilation date September 2000
2 Country UK (England)
3 Name of wetland South West London Waterbodies
4 Site centre location: Latitude: 51 23 59 N Longitude: 00 23 26 E
5 Altitude 5-25 m
6 Area (ha) 828.14

7 Overview
The South West London Waterbodies site comprises a series of reservoirs and former gravel pits that support internationally important numbers of wintering *Anas strepera* and *Anas clypeata*.

8 Wetland type Inland wetland, Man-made wetland

Code	Name	% Area
6	Reservoirs / barrages / dams	45
7	Gravel / brick / clay pits	25
Other	Other	30

9 Ramsar Criteria 6
10 Map of the site √
11 Compiler Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax : +44(0) 1733 562626 / +44(0) 1733 555948

12 Justification of criteria
Ramsar criterion 6
Over winter the site regularly supports internationally important populations of: Gadwall *Anas strepera*, Shoveler *Anas clypeata*

13 General location
The site is comprised of a series of discrete waterbodies in the Thames Valley between Windsor and Hampton Court.

Administrative Region: Greater London, Berkshire, Surrey

14 Physical Features

Soil & Geology	alluvium, clay, gravel, mud, neutral
Geomorphology and Landscape	floodplain, lowland, valley
Nutrient status	no information
PH	circumneutral
Salinity	fresh
Soil	mainly mineral
Water permanence	usually permanent
Summary of main climatic features	Rainy, temperate climate with a mild winter and periodic frost. Mean minimum temperature approximately 7.8°C. Mean

	maximum temperature approximately 14.7°C. Mean annual precipitation approximately 548.7mm, with a winter maximum.

15 Hydrological values
Public water supply

16 Ecological features
Open water, plus associated wetland habitats including grassland and woodland supporting a number of wetland plant and animal species including internationally important numbers of wintering wildfowl.

17 Noteworthy flora
None

18 Noteworthy fauna

Birds

Species occurring at levels of international importance (as identified at designation):

Over winter the area regularly supports:

Gadwall, *Anas strepera* (Northwestern Europe)	710 individuals, representing an average of 2.4% of the population (Five year peak mean for 1993/94 to 1997/98)
Shoveler, *Anas clypeata* (Northwestern/Central Europe)	853 individuals, representing an average of 2.1% of the population (Five year peak mean for 1993/94 to 1997/98)

Nationally important species occuring on the site
Phalacrocorax carbo, Podiceps cristatus, Aythya ferina, Aythya fuligula, Fulica atra

19 Social and Cultural Values
Aesthetic
Current scientific research
Non-consumptive recreation
Sport fishing

20 Land tenure/ownership

Ownership category	On-Site	Off-Site
Local authority, municipality etc.	+	+
Private	+	+
Other	+	+

21 Current land use

Activity	On-Site	Off-Site	Scale
Nature conservation	+	+	Large-Scale
Tourism	+	+	Large-Scale
Recreation	+	+	Large-Scale
Research	+	+	Large-Scale
Fishing: recreational/sport	+	+	Large-Scale
Freshwater aquaculture		+	Large-Scale
Grazing (unspecified)		+	Large-Scale
Industry		+	Large-Scale
Mineral exploration	+	+	Large-Scale

Transport route		+	Large-Scale
Domestic water supply	+	+	Large-Scale
Urban development		+	Large-Scale
Non-urbanised settlements		+	Large-Scale

22 Adverse factors affecting the ecological character of the site

Activity	On-Site	Off-Site	Scale
Vegetation succession	+	+	Large-Scale
Water diversion for irrigation/domestic/industrial use	+		Large-Scale
Recreational/tourism disturbance (unspecified)	+	+	Large-Scale
General disturbance from human activities	+	+	Large-Scale
Mining exploitation/exploration	+		Large-Scale
Transport infrastructure development		+	Large-Scale
Unspecified development: industry		+	Large-Scale
Unspecified development: urban use		+	Large-Scale
Other factor	+	+	Large-Scale

23 Conservation measures taken

Conservation measure	On-site	Off-site
SSSI	+	+
SPA	+	

24 Conservation measures proposed but not yet implemented
see below

Site vulnerability and management statement
There is an issue surrounding the potential future decommissioning of reservoirs once they are no longer required for the purposes of water supply; as well as the potential impacts of maintenance works, which may require winter draw-down of reservoirs. Discussions will be required with the current owners and occupiers regarding the future management, maintenance and decommissioning of the larger reservoirs, in order to maintain the site's interest.
The threat from potential development pressures in this urbanised and urban-fringe area is largely covered by the relevant provisions of the Conservation Regulations (1994).
Issues such as arresting (or locally reversing) vegetation succession will be addressed via management plans.
Levels of disturbance from recreational activities on one part of the site will be monitored in the winter months to determine their effects on the interest of the site.

25 Current scientific research/survey/monitoring and facilities
Wetland Birds Survey Counts

26 Current conservation education
None

27 Current recreation and tourism
Angling: fishing season only.
Sailing: all year round on gravel pits - club areas and slipways.
Birdwatching: all year round - no facilities.

28 Functional jurisdiction
Department of the Environment, Transport and the Regions

29 Management authority

English Nature
Harbour House
Hythe Quay
Colchester
Essex
CO2 8JF
UK
Tel: 01206 796666
Fax: 01206 794466

30 Bibliography

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Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat

Name: South West London Waterbodies

Unitary Authority/County: London Borough of Hounslow, Royal Borough of Windsor & Maidenhead and Surrey.

Consultation proposal: Kempton Park Reservoirs Site of Special Scientific Interest (SSSI), Knight & Bessborough Reservoirs SSSI, Thorpe Park No. 1 Gravel Pit SSSI, Wraysbury No. 1 Gravel Pit SSSI, Wraysbury Reservoir SSSI, and parts of Staines Moor SSSI and Wraysbury & Hythe End Gravel Pits SSSI have been recommended as a Ramsar site because of the site's international importance for waterbirds.

The South West London Waterbodies Ramsar site comprises a series of embanked water supply reservoirs and former gravel pits that support a range of man-made and semi-natural open-water habitats.

Boundary of Ramsar site: The Ramsar site boundary is coincident with Kempton Park Reservoirs SSSI, Knight & Bessborough Reservoirs SSSI, Thorpe Park No. 1 Gravel Pit SSSI, Wraysbury No. 1 Gravel Pit SSSI , Wraysbury Reservoir SSSI, and includes parts of Staines Moor SSSI and Wraysbury & Hythe End Gravel Pits SSSI. See Ramsar site map for further detail.

Size of Ramsar site: The Ramsar site covers an area of 828.14 ha.

International importance of Ramsar site: The Ramsar site is a Wetland of International Importance because:

a) the site qualifies under **criterion 6** because it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird:

Waterbird species	5 year peak mean 1993/94 - 1997/98	% of population
Gadwall *Anas strepera*	710 individuals - wintering	2.4 % NW Europe
Shoveler *Anas clypeata*	853 individuals - wintering	2.1 % NW/Central Europe

Bird figures from WeBS database

Non-qualifying species of interest
In addition, the site supports nationally important numbers of cormorant *Phalacrocorax carbo*, great crested grebe *Podiceps cristatus*, tufted duck *Aythya fuligula*, pochard *Aythya ferina* and coot *Fulica atra*.

Status of Ramsar site
South West London Waterbodies was designated as a Ramsar site on 22 September 2000.

Windsor Forest and Great Park SAC

NATURA 2000 - STANDARD DATA FORM

**For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)**

SITE **UK0012586**

SITENAME **Windsor Forest and Great Park**

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B	UK0012586

1.3 Site name

Windsor Forest and Great Park

1.4 First Compilation date	1.5 Update date
1995-06	2015-12

1.6 Respondent:

Name/Organisation:	Joint Nature Conservation Committee
Address:	Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY
Email:	

Date site proposed as SCI:	1995-06
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-0.623333333	51.43555556

2.2 Area [ha]:

1680.18

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKJ2	Surrey, East and West Sussex
UKJ1	Berkshire, Buckinghamshire and Oxfordshire

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
9120			272.69	0	G	C	B	A	C
9190			621.67	0	G	A	B	A	A

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species	Population in the site	Site assessment

G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
I	1079	Limoniscus violaceus			p				P	DD	A	A	A	A
I	1083	Lucanus cervus			p				P	DD	D			

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N09	4.5
N19	95.0
N06	0.5
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: acidic,clay,neutral,sand 2 Terrestrial: Geomorphology and landscape: lowland

4.2 Quality and importance

Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion) for which the area is considered to support a significant presence. Old acidophilous oak woods with Quercus robur on sandy plains for which this is one of only four known outstanding localities in the United Kingdom. Limoniscus violaceus for which this is one of only three known outstanding localities in the United Kingdom. which is known from 15 or fewer 10 x 10 km squares in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	I01		B
H	H04		B

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	A06		I
H	B02		I
H	A02		I

H	K04		I	H	A04		I
H	B02		I				

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://publications.naturalengland.org.uk/category/6490068894089216

http://publications.naturalengland.org.uk/category/3213324
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

- [ ] Yes
- [ ] No, but in preparation
- [X] No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE SPECIAL AREA OF CONSERVATION (SAC) AND SPECIAL PROTECTION AREA (SPA) STANDARD DATA FORMS

The codes in the table below generally follow those explained in the official European Union guidelines for the Standard Data Form (also referencing the relevant page number).

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	SPA (classified Special Protection Area)	53
B	cSAC, SCI or SAC (candidate Special Area of Conservation, Site of Community Importance, designated Special Area of Conservation)	53
C	SPA area/boundary is the same as the cSAC/SCI/SAC i.e. a co-classified/designated site (Note: this situation only occurs in Gibraltar)	53

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha• rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

3.1 Habitat representativity (abbreviated to 'Representativity' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent representatively	57
B	Good representatively	57
C	Significant representatively	57
D	Non-significant presence representatively	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	> 15%-100%	58
B	> 2%-15%	58
C	≤ 2%	58

3.1 Degree of conservation (abbreviated to 'Conservation' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global assessment (abbreviated to 'Global' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	> 15%-100%	62
B	> 2%-15%	62
C	≤ 2%	62
D	Non-significant population	62

3.2 Degree of conservation (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Other species – essentially covers bird assemblage types

CODE	DESCRIPTION	PAGE NO
WATR	Non-breeding waterbird assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK04	Site of Special Scientific Interest (GB)	67
UK05	Marine Conservation Zone	67
UK06	Nature Conservation Marine Protected Area	67
UK86	Special Area (Channel Islands)	67
UK98	Area of Special Scientific Interest (NI)	67
IN00	Ramsar Convention site	67
IN08	Special Protection Area	67
IN09	Special Area of Conservation	67

Richmond Park SAC

NATURA 2000 - STANDARD DATA FORM

**For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)**

SITE **UK0030246**

SITENAME **Richmond Park**

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1. SITE IDENTIFICATION

1.1 Type	1.2 Site code Back to top
B	UK0030246

1.3 Site name

Richmond Park

1.4 First Compilation date	1.5 Update date
2001-01	2015-12

1.6 Respondent:

Name/Organisation:	Joint Nature Conservation Committee
Address:	Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY
Email:	

Date site proposed as SCI:	2001-01
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-0.274444444	51.44083333

2.2 Area [ha]:

846.27

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKI2	Outer London

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

Back to top

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
I	1083	Lucanus cervus			p				C	DD	C	A	C	B

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

4.1 General site character

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Habitat class	% Cover
N06	1.5
N07	0.5
N08	25.0
N19	5.0
N14	20.0
N10	5.0
N16	25.0
N09	18.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: alluvium,neutral,clay,sand,acidic 2 Terrestrial: Geomorphology and landscape: lowland

4.2 Quality and Importance

Lucanus cervus for which this is one of only four known outstanding localities in the United Kingdom.

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://publications.naturalengland.org.uk/category/6490068894089216

http://publications.naturalengland.org.uk/category/3212324
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2018.pdf

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK01	100.0	UK04	100.0		

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

[X]	Yes	Name: Richmond Park: The Richmond Park National Nature Reserve (NNR) Management

Plan provides management infomation related to this site. This is available from Natural England.
Link:

☐ No, but in preparation

☐ No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

Wimbledon Common SAC

NATURA 2000 - STANDARD DATA FORM

**For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)**

SITE **UK0030301**

SITENAME **Wimbledon Common**

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1. SITE IDENTIFICATION

1.1 Type	1.2 Site code Back to top
B	UK0030301

1.3 Site name

Wimbledon Common

1.4 First Compilation date	1.5 Update date
2001-01	2015-12

1.6 Respondent:

Name/Organisation:	Joint Nature Conservation Committee
Address:	Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY
Email:	

Date site proposed as SCI:	2001-01
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-0.234444444	51.43222222

2.2 Area [ha]:

351.38

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKI2	Outer London

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
4010			70.28	0	M	C	C	C	C
4030			105.41	0	M	C	C	B	C

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species						Population in the site						Site assessment	
		Scientific											

G	Code	Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
I	1083	Lucanus cervus			p				C	DD	C	B	C	B

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

Back to top

4.1 General site character

Habitat class	% Cover
N07	0.5
N08	5.0
N09	45.0
N06	1.0
N16	45.0
N14	3.5
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: sand,acidic,clay 2 Terrestrial: Geomorphology and landscape: lowland

4.2 Quality and importance

Northern Atlantic wet heaths with Erica tetralix for which the area is considered to support a significant presence. European dry heaths for which the area is considered to support a significant presence. Lucanus cervus for which this is one of only four known outstanding localities in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	B02		I
H	H04		B
H	I01		B
H	J03		B

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	A02		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification, T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://publications.naturalengland.org.uk/category/5499068854089216

http://publications.naturalengland.org.uk/category/3212324
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

5. SITE PROTECTION STATUS (optional)

Back to top

5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

Back to top

6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

- [ ] Yes
- [ ] No, but in preparation
- [X] No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

Burnham Beeches SAC

NATURA 2000 - STANDARD DATA FORM

**For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)**

SITE **UK0030034**

SITENAME **Burnham Beeches**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

Back to top

1.1 Type	1.2 Site code
B	UK0030034

1.3 Site name

Burnham Beeches

1.4 First Compilation date	1.5 Update date
1998-06	2015-12

1.6 Respondent:

Name/Organisation:	Joint Nature Conservation Committee
Address:	Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY
Email:	

Date site proposed as SCI:	1998-06
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-0.630833333	51.56

2.2 Area [ha]:

383.71

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKJ1	Berkshire, Buckinghamshire and Oxfordshire

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

Back to top

3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
9120			345.34	0	M	A	B	A	A

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

4. SITE DESCRIPTION

Back to top

4.1 General site character

Habitat class	% Cover
N16	90.0

N17	5.0
N08	5.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: acidic,nutrient-poor,alluvium 2 Terrestrial: Geomorphology and landscape: lowland

4.2 Quality and importance

Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion) for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	I02		B
H	G01		I
H	M02		B
H	H04		B
H	J03		B

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	A04		I
H	B02		I
H	A02		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification, T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://publications.naturalengland.org.uk/category/5490068894089216

http://publications.naturalengland.org.uk/category/3212324
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UKD1	52.8	UKD4	100.0		

6. SITE MANAGEMENT

Back to top

6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

☐	Yes
☐	No, but in preparation
☒	No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

Thursley, Ash, Pirbright and Chobham SAC

NATURA 2000 - STANDARD DATA FORM

**For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)**

SITE **UK0012793**

SITENAME **Thursley, Ash, Pirbright and Chobham**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

Back to top

1.1 Type	1.2 Site code
B	UK0012793

1.3 Site name

Thursley, Ash, Pirbright and Chobham

1.4 First Compilation date	1.5 Update date
1996-01	2015-12

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

Date site proposed as SCI:	1996-01
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made)

2. SITE LOCATION

2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-0.693055556	51.16166667

2.2 Area [ha]:

5154.5

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKJ2	Surrey, East and West Sussex

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

Back to top

3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
4010			515.45	0	M	A	C	A	B
4030			3608.15	0	M	A	C	A	B
7150			5.15	0	G	B	C	A	A
9120			51.55	0	M	D			
91E0	X		51.55	0	M	D			

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
A	1166	Triturus cristatus			p				P	DD	D			

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

Back to top

4.1 General site character

Habitat class	% Cover
N06	5.0
N08	75.0
N07	10.0
N17	10.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: peat,acidic,sand,nutrient-poor 2 Terrestrial: Geomorphology and landscape: lowland

4.2 Quality and Importance

Northern Atlantic wet heaths with Erica tetralix for which this is considered to be one of the best areas in the United Kingdom. European dry heaths for which this is considered to be one of the best areas in the United Kingdom. Depressions on peat substrates of the Rhynchosporion for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
	Threats and	Pollution (optional)	inside/outside

Positive Impacts			
Rank	Activities, management	Pollution (optional)	inside/outside

Rank	pressures [code]	[code]	[i|o|b]
H	J02		B
H	A04		I
H	K02		I
H	H04		B
H	G05		I

	[code]	[code]	[i|o|b]
H	A04		I
H	A02		I
H	B02		I
H	D05		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://publications.naturalengland.org.uk/category/6490068894089216

http://publications.naturalengland.org.uk/category/3212224
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2016.pdf

5. SITE PROTECTION STATUS (optional)

Back to top

5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0	UK01	16.0		

6. SITE MANAGEMENT

Back to top

6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

- [ ] Yes
- [ ] No, but in preparation
- [x] No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

Thames Basin Heaths SPA

EC Directive 79/409 on the Conservation of Wild Birds
Special Protection Area (SPA)

Name: Thames Basin Heaths

Unitary Authority/County: Bracknell Forest; Hampshire; Surrey; Windsor and Maidenhead.

Site description: The Thames Basin Heaths SPA is a composite site that is located across the counties of Surrey, Hampshire and Berkshire in southern England. It encompasses all or parts of Ash to Brookwood Heaths Site of Special Scientific Interest (SSSI), Bourley and Long Valley SSSI, Bramshill SSSI, Broadmoor to Bagshot Woods and Heaths SSSI, Castle Bottom to Yateley and Hawley Commons SSSI, Chobham Common SSSI, Colony Bog and Bagshot Heaths SSSI, Eelmoor Marsh SSSI, Hazeley Heath SSSI, Horsell Common SSSI, Ockham and Wisley Commons SSSI, Sandhurst to Owlsmoor Bogs and Heaths SSSI and Whitmoor Common SSSI.

The open heathland habitats overlie sand and gravel sediments which give rise to sandy or peaty acidic soils, supporting dry heathy vegetation on well-drained slopes, wet heath on low-lying shallow slopes and bogs in valleys. The site consists of tracts of heathland, scrub and woodland, once almost continuous, but now fragmented into separate blocks by roads, urban development and farmland. Less open habitats of scrub, acidic woodland and conifer plantations dominate, within which are scattered areas of open heath and mire. The site supports important breeding populations of a number of birds of lowland heathland, especially nightjar *Caprimulgus europaeus* and woodlark *Lullula arborea*, both of which nest on the ground, often at the woodland/heathland edge, and Dartford warbler *Sylvia undata*, which often nests in gorse *Ulex* sp. Scattered trees and scrub are used for roosting.

Together with the nearby Ashdown Forest and Wealden Heaths SPAs, the Thames Basin Heaths form part of a complex of heathlands in southern England that support important breeding bird populations.

Size of SPA: The SPA covers an area of 8274.72 ha.

Qualifying species:
The site qualifies under **article 4.1** of the Directive (79/409/EEC) as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season:

Annex 1 species	Count and season	Period	% of GB population
Nightjar *Caprimulgus europaeus*	264 churring males – breeding	1998/99	7.8%
Woodlark *Lullula arborea*	149 pairs – breeding	1997	9.9%
Dartford warbler *Sylvia undata*	445 pairs – breeding	1999	27.8%

Non-qualifying species of interest: Hen harrier *Circus cyaneus*, merlin *Falco columbarius*, short-eared owl *Asio flammeus* and kingfisher *Alcedo atthis* (all Annex I species) occur in non-breeding numbers of less than European importance (less than 1% of the GB population).

Status of SPA:
Thames Basin Heaths was classified as a Special Protection Area on 9 March 2005.

ANNEX C - FIGURES

500000 501000 502000 503000 504000 505000 506000 507000 508000 509000 510000 511000 512000 513000 514000

178000 177000 176000 175000 174000 173000 172000 171000 170000 169000 168000 167000 166000

N

South West London Waterbodies

South West London Waterbodies

Sutton
Brands Hill
M4
M25
A3044
A437
Norwood Green
Colnbrook
Harmondsworth
Sipson
Harlington
Cranford
Poyle
London Heathrow Airport
Horton
Sunnymeads
Hatton
North Feltham
Hounslow Heath
Whitton
Stanwell
West Bedfont
East Bedfont
Wraysbury
Hythe End
Runnymede
Church Lammas
Birch Green
Feltham
Chattern Hill
Lower Feltham
Hanworth
Ashford
Egham
Knowle Green
Egham Hythe
Ripley
Royal Holloway
Spring
Feltham Hill
Ashford Common
Sunbury Common
Hampton Hill
Hampton
Thorpe Lea
Littleton Common
Sunbury-On-Thames
Kempton Park
Stroude
Laleham
Charlton
Littleton
Thorpe
Virginia Water
Thorpe Green
Shepperton Green
Upper Halliford
West Molesey
East Molesey
St Ann's Hill
Shepperton
Beasley's Ait
Lower Halliford
Ash Estates
Chertsey Meads
Walton-On-Thames
Lyne
Fan Grove
Pharaoh's Island
Lock Island
Hamm Court Estate
Addlestonemoor
Lower Green
Rydens

Key

- Proposed Development site
- Heathrow ownership boundary
- Unregistered land under Heathrow Airport Ltd control application to register possessory title pending determination
- Special Protection Area (SPA)
- Ramsar

0 0.85 1.7 2.55 Km

Scale at A3: 1:50,000

Heathrow

Heathrow Easterly Alternation Infrastructure Project
Environmental Statement

Figure 5.1
South West London waterbodies SPA/Ramsar site in the context of Heathrow Airport

Logika GROUP

wsp

October 2024