

Cardiff Parkway Developments Ltd.

Cardiff Hendre Lakes

2017-18 Wintering Birds Survey Report

Environmental Statement Appendix 7.17

Issue | 28 February 2020

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 252199-00

Ove Arup & Partners Ltd
63 St Thomas Street
Bristol BS1 6JZ
United Kingdom
www.arup.com

ARUP

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1 Introduction

1.1 Project Background

Ove Arup & Partners Ltd. (Arup) has been commissioned by Cardiff Parkway Developments Ltd (CPDL) to undertake baseline ecological surveys to inform the design and environmental assessment of a proposed new train station and expansion of the business park at St. Mellons, Cardiff. CPDL is proposing to develop a scheme that is an employment led development including a new railway station and park & ride facility. The site is centred on National Grid Reference ST251808.

The site currently consists of predominantly arable and pastoral farming on the western edge of St. Mellons. The site's field boundaries are formed by hedge and tree lines with reens throughout. There is a lake, recreational grassland and woodland to the west of the site. The wider landscape comprises residential and commercial properties, and broad-leaved woodland to the north and west. To the south the land is bisected by the railway line with further neighbouring agricultural land. To the east there is agricultural land.

An extended Phase 1 Habitat Survey¹ was undertaken in January 2017 (and updated in 2019) to establish the habitats present on site and to assess the potential for legally protected and important species to be present. As a result of these surveys and a desk study of available records, it was considered that there was the potential for the study area to support significant aggregations of wintering birds and therefore detailed surveys were required.

The survey area was based within the scheme boundary, which is shown on Figure 1.

This report provides information to inform the development of the project; it determines the wintering bird species present within the site, to inform any additional survey or mitigation measures that may be required.

1.2 Survey Objectives

The survey objectives were to:

- 1) gain an understanding of the wintering bird assemblage present using a transect survey methodology within representative habitats within the study area, assessing the species present and relative abundance within different habitat types;
- 2) highlight any key species of particular conservation value that may influence the design of the project; and,

¹ Arup (2017) Cardiff Hendre Lakes | 2017 Extended Phase 1 Habitat Survey Report

- 3) provide sufficient information to inform the assessment of impacts on wintering birds from the proposed development as part of the Environmental Impact Assessment.

1.3 Legislative and Policy Context

1.3.1 Designated Sites

A network of nationally designated sites has been established through the designation of Sites of Special Scientific Interest (SSSI) under the Wildlife and Countryside Act 1981 (as amended) (WCA). Sites are designated if they are of special interest by reason of their flora, fauna (e.g. birds), or geological or physiographical features. The protection afforded by the Act means it is an offence to carry out or permit to be carried out any operation listed within the notification without the consent of the Statutory Nature Conservation Organisation (Natural Resources Wales). The protection afforded to SSSIs is used to underpin the designation of areas at a European Level.

Some bird species are listed as features of European designated sites, notably Special Protection Areas (SPAs) and Ramsar sites. SPAs are classified in accordance with Article 4 of the EC Birds Directive (2009/147/EC). The provisions of the Birds Directive are implemented and transposed to UK legislation through the WCA and the Conservation of Habitats and Species Regulations 2017 (as amended). The Conservation of Habitats and Species Regulations 2017 transposes EC Habitats Directive (92/43/EEC) on the conservation of natural habitats and of wild fauna and flora into UK national law.

Ramsar sites are also afforded protection under the Ramsar Convention 1971.

These designations are applied to areas that support nationally important numbers of birds, the conservation of which is necessary for the maintenance of the range of that species across Europe. A site may be designated as an SPA based on its importance to breeding, wintering, or migratory birds. In the UK, SPA designations are underpinned by national legislation which identifies them as Sites of Special Scientific Interest (SSSI).

1.3.2 Species

Annex 1 of the EU Birds Directive 2009 and Schedule 1 of the WCA list species that are protected at all times because of their rarity and nature conservation value.

Section 6 of the Environment (Wales) Act 2016 includes a duty on all public authorities to “seek to maintain and enhance biodiversity” so far as it is consistent with the proper exercise of those functions. In so doing, public authorities must also seek to “promote the resilience of ecosystems”. This duty applies to government bodies, local authorities and statutory undertakers.

To assist in complying with this duty, public authorities must have regard to relevant evidence provided in the State of Natural Resources Report and any relevant area statement for an area in which the authority exercises functions, as well as having regard to the list of living organisms and habitats published under

Section 7 of the Act. Species and habitats listed on Section 7 are considered to be of principal importance for the conservation of biological diversity.

Local Biodiversity Action Plans (LBAPs) continue to provide a list of habitats and species of conservation significance for their relevant area. Particular attention has been paid to the Cardiff LBAP² and the Species Action Plans listed within this, which includes two species of bird (hawfinch *Coccothraustes coccothraustes* and the pied flycatcher *Ficedula hypoleuca*).

Additional conservation importance is ascribed to certain species by their presence on the Red List and Amber List of the RSPB's publication Birds of Conservation Concern (BoCC4)³ in the UK and on the Population Status of Birds in Wales⁴.

The conservation status of birds in the UK and Wales classifies birds into three lists as follows:

- Red List: species that are globally threatened, whose population or range has declined rapidly in recent years, and those whose populations have declined historically and not exhibited any signs of recovery. Species that have experienced a population decline of >50%;
- Amber List: species with an unfavourable conservation status in Europe, whose populations have declined moderately in recent years, including species that show a historical decline but whose populations have shown a substantial increase, species that are rare, with localised populations and those species of international importance with UK populations and species that have experienced a population decline or breeding range decline of 25% to 49%; and,
- Green list: All regularly occurring species that do not qualify under any of the Red or Amber criteria are green listed. The Green list also includes those species listed as recovering from historical decline in the last review that have continued to recover and do not qualify under any of the other criteria.

² Cardiff Council, 2008. Cardiff Local Biodiversity Action Plan.

³ Eaton, M. A. (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds*, 108, 708 – 746.

⁴ Johnstone, I., & Bladwell, S., 2016. Birds of Conservation Concern in Wales 3: the population status of birds in Wales. *Welsh Birds* 13: 3-31.

2 Methodology

2.1 Desk Study

Protected and notable species and non-statutory site data within 2km were obtained from the South-East Wales Biodiversity Records Centre (SEWBReC). Online searches for statutory designated sites within 5km for European site and 2km for national sites from the site centre were carried out using the Multi Agency Geographic Information Centre (MAGIC)⁵. Full information pertaining to protected and notable species, statutory and non-statutory sites are reported in the desk study section of the Extended Phase 1 Habitat Survey report.

2.2 Field Survey

The extent of the site was walked as part of the breeding bird surveys undertaken in 2017⁶. In addition to providing assessments of breeding bird activity, this enabled an assessment of the general potential suitability of different habitat areas for wintering birds to be made. Based on the findings of this investigation, it was decided that the most effective method of survey would be to carry out a transect methodology across suitable habitat.

The transect route was devised in order to encompass a range of representative habitats on site which had the potential to support wintering birds. Primary predominant habitats for selection included Hendre Lake, waterbodies and farmland.

The transect did not cover the entirety of all wintering bird habitat on site, given the size of the site. The number of wintering birds reported on site may therefore be an under-estimation. No attempt has been made to extrapolate the number of wintering birds present outside of the transect area, given the number of variables associated with wintering birds, e.g. variability in foraging behaviour and habitat quality.

The total length of the transect route was 6.9km (Figures 2 to 6). The transect route was not continuous given the nature of the site, containing numerous impassable reens and being bisected by a railway.

The transect survey method used in undertaking assessments of wintering birds was derived from current best practice as described in Bibby *et al.* 1992⁷ and Gilbert *et al.* 1998⁸, and conforms to the recommendations of the British Trust for Ornithology (BTO) and the Joint Nature Conservation Committee (JNCC).

Surveys were carried out on five occasions, once a month from November 2017 to March 2018. All wintering bird surveys were carried out by a team of two ornithological surveyors experienced in undertaking bird survey work using the

⁵ MAGIC. <http://magic.defra.gov.uk/> Accessed online 24/10/17.

⁶ Arup (2018) Cardiff Hendre Lakes | 2017 Breeding Birds Survey Report

⁷ Bibby *et al.* (1992) Bird Census Techniques, Second Edition. Academic Press

⁸ Gilbert, G., Gibbons D. W., and Evans, J. (1998) Bird Monitoring Methods. RSPB

above methods. The direction of the transect route was reversed between surveys to account for diurnal variation in wintering bird activity.

The wintering bird surveys were carried out at appropriate times of the year and weather conditions on all visits were considered suitable. The dates of the surveys and weather conditions are shown in Appendix A.

Survey results were captured using tablet devices in order to improve data collection efficiency and mapping precision, and include details of weather data, species present, numbers of individuals and their behaviour.

2.3 Target Species

Given the above legislation and policy at European, national and local level certain bird species are targeted for further consideration during the proposed bird surveys. Target bird species are those listed as qualifying features of SPAs and Ramsar sites. These species are considered in order to inform any future Habitat Regulations Assessments (HRA). With respect to the proposed redevelopment additional bird species are listed below, which are listed as qualifying features of SSSIs. These species include wintering, migratory and breeding species. For inclusivity all breeding species are included even though in reality many breeding species will be permanently absent over the winter period.

Target bird species, listed within each designated site are as below (full details provided within Appendix B):

- Severn Estuary Ramsar: Bewick's swan *Cygnus columbianus bewickii*, greater white-fronted goose *Anser albifrons albifrons*, shelduck *Tadorna tadorna*, gadwall *Mareca strepera strepera*, dunlin *Calidris alpina alpina*, redshank *Tringa totanus totanus*, ringed plover *Charadrius hiaticula*, teal *Anas crecca*, pintail *Anas acuta*. All wetland birds are included under the assemblage feature.
- Severn Estuary SPA: Bewick's swan, ringed plover, curlew *Numenius arquata*, dunlin, pintail, redshank, shelduck, gadwall, wigeon *Mareca penelope*, lapwing *Vanellus vanellus*, teal, mallard *Anas platyrhynchos*, shoveler *Anas clypeata*, pochard *Aythya ferina*, tufted duck *A. fuligula*, grey plover *Pluvialis squatarola*, white-fronted goose and whimbrel *Numenius phaeopus*. All wetland birds are included under the assemblage feature.
- Severn Estuary SSSI: curlew, redshank, ringed plover, grey plover, common snipe *Gallinago gallinago*, knot *Calidris canutus*, whimbrel, turnstone *Arenaria interpres*, dunlin, shelduck and wigeon.

Species listed on Cardiff Council's LBAP and those listed on Section 7 of the Environment (Wales) Act were also recorded where possible. Species not defined as target species are recorded as incidental.

2.4 Survey Data Analysis

The data gathered during field survey work is shown on Figures 2 to 6, combining that obtained from each survey visit in order to reveal patterns of wintering bird activity. These results are then discussed within the Results section of this report. Results are discussed in the following order:

- an initial overview of all results gathered, including total species recorded within the study area; and,
- in relation to the conservation status of the birds present and whether they are considered to be within the Zone of Influence⁹ with regards to potential impacts of protected site populations. Conservation status of birds are discussed as:
 - individual features of the SPA/Ramsar site with a Zone of Influence considered to be 5km from the designated site boundary. Species designated as breeding features are not considered in this report and are discussed in the breeding bird survey report⁶;
 - assemblage and noteworthy faunal species, as specified for SPA/Ramsar sites;
 - wintering bird features of Sites of Special Scientific Interest (SSSI) with a Zone of Influence considered to be 2km from the designated site boundary;
 - Section 7 species of principal importance of the Environment (Wales) Act and Cardiff County LBAP species; and,
 - species which are included on either the Red or Amber List of Birds of Conservation Concern 4 and The Population Status of Birds in Wales 3, but not included in the above groups.

Wintering and passage birds of importance in South Wales were determined based upon the *Guidelines for the Selection of Wildlife Sites in South Wales* selection criteria for Wildlife Sites of county importance¹⁰.

An analysis was undertaken to identify areas important for wintering birds, using species listed designated sites and of conservation concern, i.e. SPA / Ramsar site designations, SSSI features, Red or Amber birds of conservation concern; birds of county importance¹⁰ and S7 species.

Mapping of birds and in relation to the density of observations allows for areas of importance to be identified.

⁹ The 'zone of influence' for a project is the area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond site boundaries. Determining the zone of influence of the project and which important ecological features could be significantly affected is a key activity of the Scoping process (taken from CIEEM, 2016 – Chartered Institute of Ecology and Environmental Management (2016) *Guidelines for Ecological Impact Assessment in the UK and Ireland Terrestrial, Freshwater and Coastal* (Second edition January 2016)).

¹⁰ The South Wales Wildlife Sites Partnership, 2004. *Guidelines for the Selection of Wildlife Sites in South Wales*.

2.5 Limitations and Assumptions

The entirety of the site, including all reens, ditches and field margins, was not surveyed given the extent of the habitats on site and possibility for duplication in counts given the time taken to survey birds. However, it is considered that the most representative and suitable habitat on site for wintering birds was surveyed. It is recognised that some reens or ditches may hold small numbers of wintering birds, e.g. waterfowl, which may have been missed.

Highly mobile bird species, e.g. gulls, may be under-represented due to the necessity to avoid double-counting.

Analysis of important areas for birds is biased, to an extent, on the distribution of the transect route. The areas outside this route are considered however to not significantly influence the analysis, as significant congregations of birds were likely to still be viewable.

Surveys were carried out from November to March, and whilst a survey in October was anticipated late instruction prevented access to site. Given this limitation, it is considered however that an October survey would be unlikely to significantly change the results.

The findings presented in this study represent those at the time of survey and reporting, and data collected from available sources. Ecological surveys are limited by factors which affect the presence of species, such as weather conditions, migration patterns and behaviour.

Nevertheless, these surveys were conducted at the optimal survey periods. Every effort has been made to ensure that the findings of the study present as accurate an interpretation as possible of the status of wintering birds within the study area.

3 Results

3.1 Desk Study

SEWBRc provided a large volume of bird data pertaining to SPA/Ramsar species and Section 7 species. Schedule 1¹¹ species are not reported given their protection during the breeding season and the winter nature of this report.

SPA and Ramsar qualifying species found within the 2km search area include the following: Bewick's swan, ringed plover, curlew and pintail.

Section 7 species found within the 2km search area include the following: dark-bellied brent goose *Branta bernicla bernicla*, Bewick's swan, garganey *Anas querquedula*, common scoter *Melanitta nigra*, grey partridge *Perdix perdix*, bittern *Botaurus stellaris*, hen harrier *Circus cyaneus*, kestrel *Falco tinnunculus*, corncrake *Crex crex*, lapwing *Vanellus vanellus*, golden plover *Pluvialis apricaria*, ringed plover, whimbrel, curlew, black-headed gull *Chroicocephalus ridibundus*, turtle dove *Streptopelia turtur*, cuckoo *Cuculus canorus*, nightjar *Caprimulgus europaeus*, kingfisher *Alcedo atthis*, lesser spotted woodpecker *Dendrocopos minor*, woodlark *Lullula arborea*, skylark *Alauda arvensis*, grasshopper warbler *Locustella nivalis*, starling *Sturnus vulgaris*, ring ouzel *Turdus torquatus*, song thrush *T. philomelos*, spotted flycatcher *Muscicapa striata*, pied flycatcher, house sparrow *Passer domesticus*, dunnock *Prunella modularis*, yellow wagtail *Motacilla flava*, tree pipit *Anthus trivialis*, hawfinch, bullfinch *Pyrrhula pyrrhula*, twite *Linaria flavirostris*, linnet *L. cannabina*, lesser redpoll *Acanthis cabaret*, yellowhammer *Emberiza citronella* and reed bunting *E. schoeniclus*.

3.2 Field Survey

Full survey results are shown on Figures 2 to 6. The results in Appendix C collate all results, showing the maximum number of birds recorded from the visits, summing across observations of birds on the ground and flights across the site.

In relation to the target bird species, a total of 21 species were recorded during the winter bird surveys. No species listed as qualifying features of the Severn Estuary SPA were recorded. No species listed as qualifying features of the Severn Estuary Ramsar site were recorded.

All 21 target bird species recorded are considered as waterfowl, being ecologically dependent on wetlands and thus contributing to the assemblage feature qualification of both the Severn Estuary SPA and Ramsar. A peak count of 659 target birds was recorded in February, representing 0.93% and 0.70% of the Ramsar and SPA assemblage population, respectively.

One species is further listed for the Severn Estuary SSSI, namely common snipe.

¹¹ Schedule 1 species of the Wildlife and Countryside Act 1981 (as amended).

Two target species are listed on Section 7 of the Environment (Wales) Act: golden plover and black-headed gull. No Cardiff County LBAP species were recorded on site.

A total of one target bird was recorded that is placed on the UK Red List and four species on the Welsh Red List. Eight species were placed on the UK Amber List and eight on the Welsh Amber List. A number of incidental species were recorded which are placed on the UK and Welsh Red and Amber List. The remaining species are green listed.

Fourteen species were recorded as of county importance, with regards to the designation of Wildlife Sites in South Wales based on bird species recorded.

The aforementioned survey results are presented in relation to conservation criteria are as follows:

SPA/Ramsar Features

Severn Estuary SPA and Ramsar both have assemblages of waterfowl as qualifying features. The following species, all considered as waterfowl being ecologically dependent upon wetlands (in addition to those waterfowl described above), are:

- Mute swan *Cygnus olor*, Canada goose *Branta canadensis*, goosander *Mergus merganser*, mallard, teal, little grebe *Tachybaptus ruficollis*, great crested grebe *Podiceps cristatus*, cormorant *Phalacrocorax carbo*, grey heron *Ardea cinerea*, moorhen *Gallinula chloropus*, coot *Fulica atra*, kingfisher, golden plover, jack snipe *Limnocryptes minimus*, common snipe, green sandpiper *Tringa ochropus*, black-headed gull, lesser black-backed gull *Larus fuscus* and herring gull *L. argentatus*; and,
- taking the peak sum of all target birds on a single visit the proportion of target birds on site is 0.93 % of the Ramsar assemblage population and 0.70 % of the SPA assemblage population. The peak count recorded was 659 target birds from February 2018.

Water rail *Rallus aquaticus* and little egret *Egretta garzetta* were both recorded on site and are both listed as noteworthy fauna of national importance with regards to the Severn Estuary Ramsar site.

Severn Estuary SSSI Features

A peak count of 55 common snipe were recorded in January, primarily on the margins of the island in Hendre Lake and also in a field immediately north of the train line (Point 5, Figure 7). Population figures are not provided for snipe in the Severn Estuary SSSI. Snipe were recorded in all months on site.

Section 7 and Cardiff County LBAP Species

Of the target species recorded the following three species are listed in response to Section 7 of the Environment (Wales) Act: golden plover, black-headed gull and kestrel.

No Cardiff County LBAP species were recorded during the winter surveys.

Red and Amber List Species

Herring gull is the only target bird species recorded that is placed on the UK Red list. Golden plover, black-headed gull, woodcock *Scolopax rusticola* and herring gull are the only target birds on the Welsh Red List.

Mute swan, green sandpiper, kingfisher, lesser black-backed gull, teal, mallard, common snipe and black-headed gull are the only target bird species recorded on the UK Amber list. Cormorant, coot, jack snipe, kingfisher, teal, common snipe, green sandpiper and lesser black-backed gull are the only target birds on the Welsh Amber list.

A number of incidental bird species were recorded that are placed on the UK and Welsh Red and Amber list. These are detailed in Appendix C.

Species of County Importance

Using the *Guidelines for the Selection of Wildlife Sites in South Wales* fourteen species were observed on site, which are considered to be of conservation significance. Little egret, water rail and Cetti's warbler *Cettia cetti* were the only species of wintering or passage bird on site of such significance to allow the designation of a Wildlife Site. Species which would contribute to that designation which were recorded on site include teal, golden plover, snipe, woodcock, skylark, kingfisher, peregrine *Falco peregrinus*, stock dove *Columba oenas*, reed bunting, kestrel and stonechat *Saxicola rubicola*.

Important Areas for Wintering Birds

From mapping the distribution of birds of particular conservation status it can be seen that a number of localities appear to be of higher value compared to others, when considering also the density of observations (Figure 7).

Hendre Lake (Point 1, Figure 7) and the main western reen (Point 1, Figure 7) supported a number of wetland bird species and winter migrants, e.g. redwing *Turdus iliacus* and fieldfare *T. pilaris*. These two sites were subjectively the most important containing a high density of birds of conservation concern. Arable fields in the northern side of the site, including hedgerows and reen systems to the west and centre of the site, again supported a number of wetland and winter birds, including green sandpiper. An eastern cattle field on the site (Point 3, Figure 7) held a number of little egret and redwing across winter, where they were observed foraging. A marshy grassland to the north of the railway track (Point 5, Figure 7) held notable numbers of snipe, jack snipe and a woodcock over winter. Arable fields (in the centre of the southern side of the site), including hedgerows and reen systems (Point 6, Figure 7), were observed to hold redwing, Cetti's warbler, grey heron, stonechat and song thrush across winter.

4 Conclusions

A total of 21 target bird species were recorded during the winter bird surveys. A further 19 incidental species were recorded. No species listed as qualifying features of the Severn Estuary SPA or Ramsar site were recorded.

All 21 target bird species recorded are considered as waterfowl, being ecologically dependent on wetlands and thus contributing to the assemblage feature qualification of both the Severn Estuary SPA and Ramsar. A peak count of 659 target birds was recorded in February, representing 0.93% and 0.70% of the Ramsar and SPA assemblage population, respectively.

One species is further listed for the Severn Estuary SSSI, namely common snipe.

In general, the species recorded on site are a typical assemblage of passage and wintering birds, associated with agricultural land, scrub and wetlands.

The most important habitat for wintering birds on site is likely to be considered Hendre Lake and the main western reed. Winter birds were however found across the site in a number of other habitats, i.e. arable fields and marshy grassland.

It should be noted that this winter bird survey did not include specific searches for species that are typically crepuscular or nocturnal, e.g. owls. Habitat on site is suitable for foraging owls, notably barn owl (which is a Schedule 1 species).

5 Recommendations

Any impact from the proposed works on features of designated sites, e.g. wintering birds, should be evaluated as part of the Environmental Impact Assessment to support the planning application.

In order to comply with the requirements of the Conservation of Habitats and Species Regulations 2017, an HRA Screening Report is to be required in order to identify whether the proposed works are likely to have a significant effect on the features of the European designated sites, namely Severn Estuary SPA and Ramsar site. It is recommended there is consultation with statutory bodies, i.e. Natural Resources Wales, to define the potential scale of impact on wintering birds, in relation to the designated sites.

No trees were initially considered suitable for barn owl nests, however barn owl surveys are recommended, with regards to the project programme, to identify any change in nesting opportunities, i.e. though tree degradation or foraging habitat change. In general, it is also recommended that foraging habitat retention, protection and enhancement measures are implemented, such as barn owl nest box provision. Opportunities should be sought during the design process to specifically enhance habitats of importance for notable bird species, e.g. marginal habitat, reens, marshy grassland etc.

Furthermore, standard construction mitigation should be adopted following best practice guidance, in particular avoiding disturbance and loss of habitat to wintering birds, where possible.

This report is the result of survey work undertaken between November 2017 and March 2018. This report refers, within the limitations stated, to the condition or proposed works of the site at the time of the surveys. Changes in legislation, guidance, best practice, etc. may necessitate a re-assessment/survey. No warranty is given as to the possibility of future changes in the condition of the site.

Figures

Figure 1. European and nationally designated sites within 5km and 2km of the site boundary, respectively.

Figure 2. Wintering Bird Survey Results – November 2017.

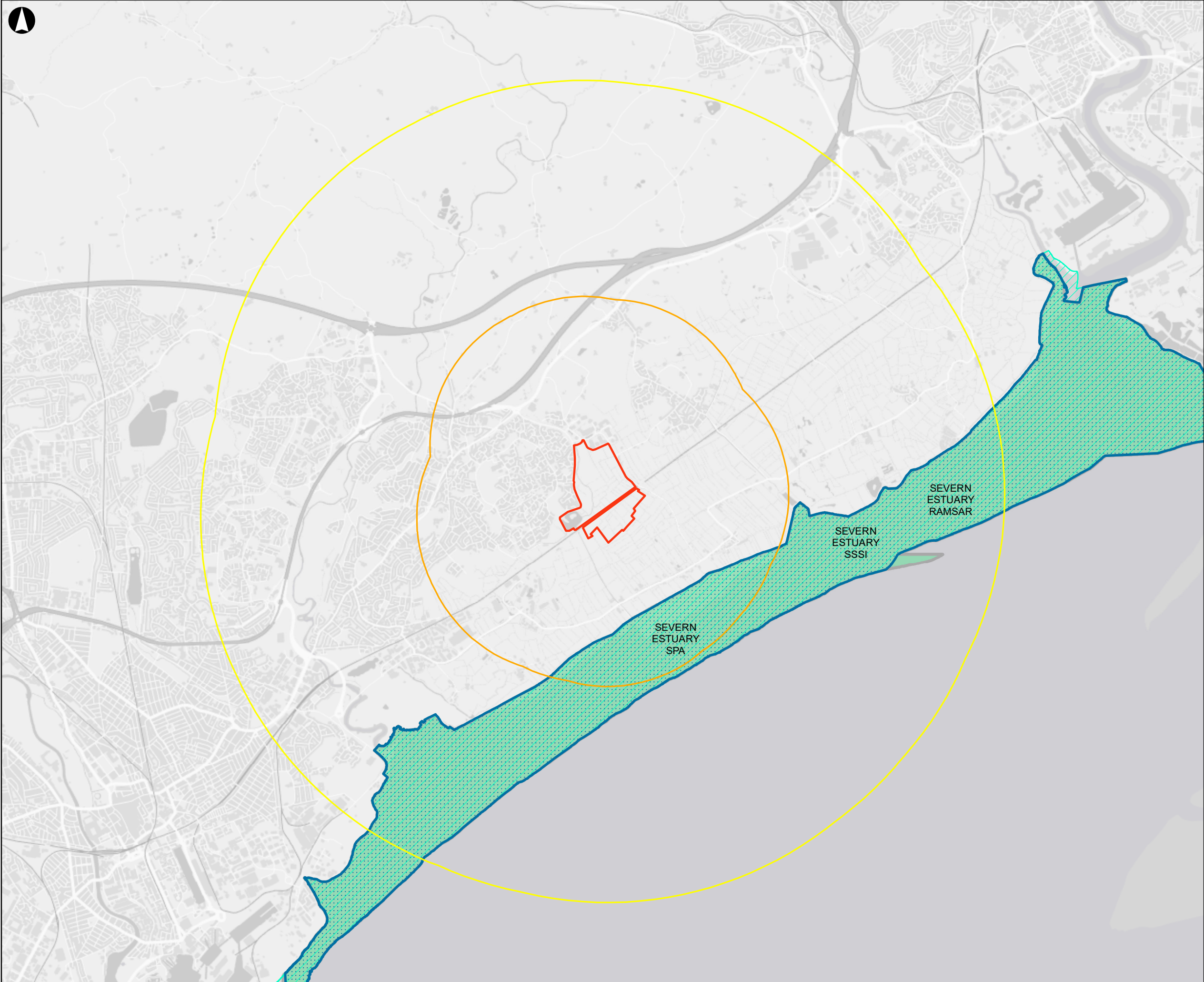
Figure 3. Wintering Bird Survey Results – December 2017.

Figure 4. Wintering Bird Survey Results – January 2018.

Figure 5. Wintering Bird Survey Results – February 2018.

Figure 6. Wintering Bird Survey Results – March 2018.

Figure 7. Wintering Bird Survey Results – Important Areas for Birds.



Legend

Study AreaBoundary - 2km Buffer

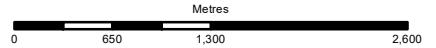
Study Area Boundary - 5km Buffer

Statutory Sites

Special Protection Areas (SPA)

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F1	2017-01-30	EB	PW	PC
Issue	Date	By	Chkd	Appd



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Client

Cardiff Parkway Developments Ltd

Job Title

Cardiff Hendre Lakes

Environmental Designations

Scale at A3

1:50,000

Job No	Drawing Status	Issue
252199	For Issue	F1
Drawing No		
Figure 1		



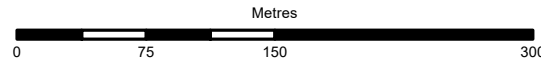
Legend

- Transect Route
- Bird Sighting
- Bird Flightline

- Study Area Boundary
- Species Codes:**
- MH - Moorhen
 - MS - Mute Swan
 - PE - Peregrine
 - RE - Redwing
 - SN - Snipe
 - T. - Teal
 - WA - Water Rail
 - BH - Black-headed Gull
 - BZ - Buzzard
 - CA - Cormorant
 - ET - Little Egret
 - FF - Fieldfare
 - GE - Green Sandpiper
 - GG - Great Crested Grebe
 - H. - Grey Heron
 - KF - Kingfisher
 - LB - Lesser Black-backed Gull
 - LR - Lesser Redpoll
 - M. - Mistle Thrush
 - MA - Mallard

F1	2018-04-30	FG	AC	PC
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Issue	Date	By	Chkd	Appd
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ARUP

63 St. Thomas Street
Bristol BS1 6JZ
(T)+44179765432 (F)+441179765433

Client
Cardiff Parkway Developments Ltd.

Job Title
Cardiff Hendre Lakes

Wintering Birds Survey - November

Scale at A3
1:5,500

Job No
252199-00

Drawing Status
For Issue

Drawing No
Figure 2

Issue
F1

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Drawing No	Issue
Figure 3	F1



Drawing No	Issue
Figure 4	F1

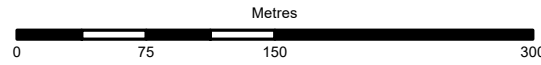


Legend

- Transect Route
- Bird Sighting
- Bird Flightline

- Study Area Boundary
- Species Codes:**
- RE - Redwing
 - SC - Stonechat
 - SN - Snipe
 - T. - Teal
 - WA - Water Rail
 - WK - Woodcock
 - BH - Black-headed Gull
 - BZ - Buzzard
 - CA - Cormorant
 - CG - Canada Goose
 - ET - Little Egret
 - FF - Fieldfare
 - GD - Goosander
 - GG - Great Crested Grebe
 - GP - Golden Plover
 - H. - Grey Heron
 - KF - Kingfisher
 - MA - Mallard
 - MH - Moorhen
 - MP - Meadow Pipit
 - MS - Mute Swan

F1	2018-07-11	FG	AC	PC
Issue	Date	By	Chkd	Appd



ARUP

63 St. Thomas Street
Bristol BS1 6JZ
(T)+44179765432 (F)+441179765433

Client
Cardiff Parkway Developments Ltd.

Job Title
Cardiff Hendre Lakes

Wintering Birds Survey - February

Scale at A3
1:5,500

Job No
252199-00

Drawing Status
For Issue

Drawing No
Figure 5

Issue
F1

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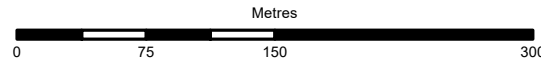
Legend

- Transect Route
- Bird Sighting
- Bird Flightline

- Study Area Boundary
- Species Codes:**
- RE - Redwing
 - SC - Stonechat
 - SN - Snipe
 - T. - Teal
 - WA - Water Rail
 - WK - Woodcock
 - BH - Black-headed Gull
 - BZ - Buzzard
 - CA - Cormorant
 - CG - Canada Goose
 - ET - Little Egret
 - FF - Fieldfare
 - GD - Goosander
 - GG - Great Crested Grebe
 - GP - Golden Plover
 - H. - Grey Heron
 - KF - Kingfisher
 - MA - Mallard
 - MH - Moorhen
 - MP - Meadow Pipit
 - MS - Mute Swan

F1	2018-07-11	FG	AC	PC
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Issue	Date	By	Chkd	Appd
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ARUP

63 St. Thomas Street
Bristol BS1 6JZ
(T)+44179765432 (F)+441179765433

Client
Cardiff Parkway Developments Ltd.

Job Title
Cardiff Hendre Lakes

Wintering Birds Survey - March

Scale at A3
1:5,500

Job No
252199-00

Drawing Status
For Issue

Drawing No
Figure 6

Issue
F1

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Legend

- Target Species
- Transect Route
- Study Area Boundary

F1	2020-01-16	AC	SC	PC
Issue	Date	By	Chkd	Appd

Metres

0 75 150 300

ARUP

63 St. Thomas Street
Bristol BS1 6JZ
(T)+44179765432 (F)+441179765433

Client
Cardiff Parkway Developments Ltd.

Job Title
Cardiff Hendre Lakes

**Wintering Birds Survey -
Important Areas for Wintering Birds**

Scale at A3
1:5,737

Job No 252199-00	Drawing Status For Issue
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Drawing No Figure 7	Issue F1
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Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Appendix A

Weather Conditions

A1 Weather Conditions

Visit	Month	Date	Temp. (°C)	Wind Speed (Beaufort Scale)	Wind Direction	Cloud Cover (%)	Conditions
1	Nov	16/11/2017	11	1	SW	25	Dry.
2	Dec	19/12/2017	1	1	W	25	Sunny, with frost at survey start. Ice present in reens.
3	Jan	17/01/2018	4	1	S	25	Dry.
4	Feb	09/02/2018	3	2	W	40	Light snow at start.
5	Mar	20/03/2018	3	1	N	15	Dry.

Appendix B

Target Wintering Bird Species

B1 Target Wintering Bird Species

Designated Site	Feature	Common name	Scientific name	Population (as identified at designation)
Severn Estuary Ramsar	Assemblages of international importance			70919 waterfowl (5 year peak mean 1998/99-2002/2003)
	Species/ populations occurring at levels of international importance.	Bewick's swan	<i>Cygnus columbianus bewickii</i>	229 individuals, representing an average of 2.8% of the GB population (5 year peak mean 1998/9- 2002/3)
		Greater white-fronted goose	<i>Anser albifrons albifrons</i>	2076 individuals, representing an average of 35.8% of the GB population (5 year peak mean for 1996/7-2000/01)
		Common shelduck	<i>Tadorna tadorna</i>	3223 individuals, representing an average of 1% of the population (5 year peak mean 1998/9- 2002/3)
		Gadwall	<i>Mareca strepera strepera</i>	241 individuals, representing an average of 1.4% of the GB population (5 year peak mean 1998/9- 2002/3)
		Dunlin	<i>Calidris alpina alpina</i>	25082 individuals, representing an average of 1.8% of the population (5 year peak mean 1998/9-2002/3)
		Common redshank	<i>Tringa totanus totanus</i>	2616 individuals, representing an average of 1% of the population (5 year peak mean 1998/9- 2002/3)
	Species with peak counts in spring/autumn identified subsequent to designation for possible future consideration.	Ringed plover	<i>Charadrius hiaticula</i>	740 individuals, representing an average of 1% of the population (5 year peak mean 1998/9- 2002/3)
	Species with peak counts in winter identified subsequent to designation for possible future consideration.	Eurasian teal	<i>Anas crecca</i>	4456 individuals, representing an average of 1.1% of the population (5 year peak mean 1998/9-2002/3)

Designated Site	Feature	Common name	Scientific name	Population (as identified at designation)
	Noteworthy fauna; species currently occurring at levels of national importance. Species with peak counts in spring/autumn:	Northern pintail	<i>Anas acuta</i>	756 individuals, representing an average of 1.2% of the population (5 year peak mean 1998/9- 2002/3)
		Little egret	<i>Egretta garzetta</i>	17 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9- 2002/3)
		Ruff	<i>Philomachus pugnax</i>	12 individuals, representing an average of 1.7% of the GB population (5 year peak mean 1998/9- 2002/3)
		Whimbrel	<i>Numenius phaeopus</i>	333 individuals, representing an average of 11.1% of the GB population (5 year peak mean 1998/9- 2002/3 – spring peak)
		Eurasian curlew	<i>Numenius arquata</i>	2021 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9- 2002/3)
		Common greenshank	<i>Tringa nebularia</i>	26 individuals, representing an average of 4.3% of the GB population (5 year peak mean 1998/9- 2002/3)
	Noteworthy fauna; species currently occurring at levels of national importance. Species with peak counts in winter:	Eurasian wigeon	<i>Mareca penelope</i>	4658 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9- 2002/3)
		Northern shoveler	<i>Anas clypeata</i>	297 individuals, representing an average of 2% of the GB population (5 year peak mean 1998/9- 2002/3)
		Common pochard	<i>Aythya farina</i>	1118 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9- 2002/3)
		Water rail	<i>Rallus aquaticus</i>	11 individuals, representing an average of 2.4% of the GB population (5 year peak mean 1998/9- 2002/3)
		Spotted redshank	<i>Tringa erythropus</i>	10 individuals, representing an average of 7.3% of the GB population (5 year peak mean 1998/9- 2002/3)
Severn Estuary SPA	Annex I over wintering species	Bewick's swan	<i>Cygnus columbianus bewickii</i>	80 individuals representing at least 4.0% of the wintering population in Great Britain (5 year peak mean 1991/2 – 1995/6)

Designated Site	Feature	Common name	Scientific name	Population (as identified at designation)
	Annex I migratory passage species	Ringed plover	<i>Charadrius hiaticula</i>	655 individuals representing at least 1.3% of the Europe/Northern Africa – wintering population (5 year peak mean 1991/2 – 1995/6)
	Annex I migratory over-winter species	Curlew	<i>Numenius arquata</i>	3,903 individuals representing at least 1.1% of the wintering Europe – breeding population (5 year peak mean 1991/2 – 1995/6)
		Dunlin	<i>Calidris alpina alpina</i>	44,624 individuals representing at least 3.2% of the wintering Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/2 – 1995/6)
		Pintail	<i>Anas acuta</i>	599 individuals representing at least 1.0% of the wintering Northwestern Europe population (5 year peak mean 1991/2 – 1995/6)
		Redshank	<i>Tringa totanus</i>	2,330 individuals representing at least 1.6% of the wintering Eastern Atlantic – wintering population (5 year peak mean 1991/2 – 1995/6)
		Shelduck	<i>Tadorna tadorna</i>	3,330 individuals representing at least 1.1% of the wintering Northwestern Europe population (5 year peak mean 1991/2 – 1995/6)
	Assemblages of international importance, regularly supporting at least 20, 000 waterfowl: Over winter, the area regularly supports 93,986 individual waterfowl (5 year peak mean 1991/2 – 1995/6) including: gadwall <i>Mareca strepera</i> , shelduck <i>Tadorna tadorna</i> , pintail <i>Anas acuta</i> , dunlin <i>Calidris alpina alpina</i> , curlew <i>Numenius arquata</i> , redshank <i>Tringa totanus</i> , Bewick's swan <i>Cygnus columbianus bewickii</i> , wigeon <i>Mareca penelope</i> , lapwing <i>Vanellus vanellus</i> , teal <i>Anas crecca</i> , mallard <i>Anas platyrhynchos</i> , shoveler <i>Anas clypeata</i> , pochard <i>Aythya ferina</i> , tufted duck <i>Aythya fuligula</i> , grey plover <i>Pluvialis squatarola</i> , white-fronted goose <i>Anser albifrons albifrons</i> , whimbrel <i>Numenius phaeopus</i> .			
Severn Estuary SSSI		Curlew	<i>Numenius arquata</i>	-
		Redshank	<i>Tringa totanus</i>	-
		Ringed plover	<i>Charadrius hiaticula</i>	-

Designated Site	Feature	Common name	Scientific name	Population (as identified at designation)
		Grey plover	<i>Pluvialis squatarola</i>	-
		Common snipe	<i>Gallinago gallinago</i>	-
		Knot	<i>Calidris canutus</i>	-
		Whimbrel	<i>Numenius phaeopus</i>	-
		Turnstone	<i>Arenaria interpres</i>	-
		Dunlin	<i>Calidris alpina</i>	SSSI supports about 7.5% of the British wintering population. The estuary as a whole supports about 10.5% of the British wintering population and is the single most important wintering ground of Dunlin in Britain.
		Shelduck	<i>Tadorna tadorna</i>	Late winter and early spring
		Wigeon	<i>Mareca penelope</i>	Late winter and early spring

Appendix C

Wintering Bird Survey Data

C1 Wintering Bird Data

No.	Common Name	Scientific Name	Target Species	Designation*	Nov '17	Dec '17	Jan '18	Feb '18	Mar '18
1	Mute swan	<i>Cygnus olor</i>	Y	Amber / Green	7	3	2	14	4
2	Canada goose	<i>Branta canadensis</i>	Y	**	0	6	7	5	55
3	Teal	<i>Anas crecca</i>	Y	B, Amber, Severn Estuary SPA and Ramsar	15	20	11	0	8
4	Mallard	<i>Anas platyrhynchos</i>	Y	Amber, Severn Estuary SPA	63	25	16	20	23
5	Goosander	<i>Mergus merganser</i>	Y	Green	0	0	1	0	0
6	Little grebe	<i>Tachybaptus r. ruficollis</i>	Y	Green	0	0	0	2	1
7	Great crested grebe	<i>Podiceps cristatus</i>	Y	Green	1	4	4	6	2
8	Cormorant	<i>Phalacrocorax carbo</i>	Y	Green / Amber	3	0	1	1	1
9	Little egret	<i>Egretta garzetta</i>	Y	A, Annex I, Green	6	3	6	5	3
10	Grey heron	<i>Ardea cinerea</i>	Y	Green / Amber	4	4	2	1	3
11	Water rail	<i>Rallus aquaticus</i>	Y	A, Green	4	2	2	1	0
12	Moorhen	<i>Gallinula chloropus</i>	Y	Green	6	2	7	1	9
13	Coot	<i>Fulica atra</i>	Y	Green / Amber	0	1	0	3	0
14	Golden plover	<i>Pluvialis apricaria</i>	Y	B, Green / Red, S7	0	235	0	0	0
15	Jack snipe	<i>Lymnocyptes minimus</i>	Y	Green / Amber	0	1	0	0	1

No.	Common Name	Scientific Name	Target Species	Designation*	Nov '17	Dec '17	Jan '18	Feb '18	Mar '18
16	Snipe	<i>Gallinago gallinago</i>	Y	B, Amber, Severn Estuary SSSI	12	18	55	11	21
17	Woodcock	<i>Scolopax rusticola</i>	N	B, Red	0	0	1	0	0
18	Green sandpiper	<i>Tringa ochropus</i>	Y	Amber	1	0	0	0	0
19	Black-headed gull	<i>Chroicocephalus ridibundus</i>	Y	Amber / Red, S7	42	96	34	437 - 587	19
20	Lesser black-backed gull	<i>Larus fuscus</i>	Y	Amber	2	0	0	0	11
21	Herring gull	<i>Larus argentatus</i>	Y	Red, S7	0	5	0	1	3
22	Buzzard	<i>Buteo buteo</i>	N	Green	2	0	4	1	1
23	Peregrine	<i>Falco peregrinus</i>	N	B, Green	1	0	0	1	0
24	Kestrel	<i>Falco tinnunculus</i>	N	B, Amber / Red, S7	0	0	1	0	0
25	Stock dove	<i>Columba oenas</i>	N	B, Amber / Green	0	0	0	0	17
26	Skylark	<i>Alauda arvensis</i>	N	B, Red / Amber, S7	0	5	0	3	0
27	Kingfisher	<i>Alcedo atthis</i>	Y	Annex I, B, Amber	2	4	1	1	1
28	Meadow pipit	<i>Anthus pratensis</i>	N	Amber	0	0	0	40	29
29	Pied wagtail	<i>Motacilla alba yarrelli</i>	N	Green	0	0	0	25	0
30	Stonechat	<i>Saxicola rubicola</i>	N	B, Green	0	0	1	2	0
31	Lesser redpoll	<i>Acanthis cabaret</i>	N	Red / Amber, S7	1	0	0	0	0
32	Blackbird	<i>Turdus merula</i>	N	Green	0	8	0	0	0
33	Fieldfare	<i>Turdus pilaris</i>	N	Red / Amber	2	0	1	0	0

No.	Common Name	Scientific Name	Target Species	Designation*	Nov '17	Dec '17	Jan '18	Feb '18	Mar '18
34	Song thrush	<i>Turdus philomelos</i>	N	Red / Amber, S7	0	1	0	1	0
35	Redwing	<i>Turdus iliacus</i>	N	Red / Amber	84	172	88	123	5
36	Mistle thrush	<i>Turdus viscivorous</i>	N	Red / Amber	2	2	0	0	0
37	Cetti's warbler	<i>Cettia cetti</i>	N	A, Green	0	0	0	1	2
38	Jay	<i>Garrulus glandarius</i>	N	Green	0	3	0	2	0
39	Starling	<i>Sturnus vulgaris</i>	N	Red, S7	0	91	0	0	0
40	Reed bunting	<i>Emberiza schoeniclus</i>	N	B, Amber, S7	0	2	0	1	0

* Designation: Annex I = Species designated on Annex I of the Birds Directive; A = Species Designates for Local Wildlife Site in South Wales; B = Species Contributes to Local Wildlife Sites in South Wales; * Red, Amber, Green = Status of each species on the BOCC4 or BOCCW3, respectively; S7 = Species of principal importance, with regards to S7 of the Environment (Wales) Act 2016.

** = Canada goose, as a non-native species is excluded from the Birds of Conservation Concern listings.