

**IDENTIFICATION OF WINTERING WATERFOWL
HIGH TIDE ROOSTS ON THE
SEVERN ESTUARY SSSI/SPA
PHASE 4 (GLOUCESTERSHIRE, WITH
PART OF SOUTH GLOUCESTERSHIRE)**



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1.0 Executive summary

- 1.1. This work represents the fourth phase of a wider assessment to identify roost sites in the Severn Estuary SPA and provides information on waterbird high tide roosts in winter, and where sufficient information was available, spring and autumn passage, between Longney Sands and Beachley point.
- 1.2. The work had four principal objectives. These were to, within the above study area:
 - Capture the knowledge of local BTO WeBS counters;
 - Map the roost locations of the SPA birds (referred to in this report as Interest Species);
 - Describe the SPA bird assemblage at each roost;
 - Record the characteristics of each roost (e.g. habitat or feature).
- 1.3. For those Sectors currently covered by WeBS volunteers, the local knowledge of the counters was captured via a face-to-face interview to collect information on roost site locations, assemblages and their characteristics, followed by a site visit to ground truth the information provided and collect any additional information.
- 1.4. For those Sectors not currently covered by WeBS volunteers, monthly visits were made between September 2016 and March 2017, to undertake surveys following the WeBS survey methodology and to identify roost locations, assemblages and habitat characteristics.
- 1.5. For all Sectors, desk study records supplied by the Gloucestershire County Bird Recorder were examined for additional evidence of roosting sites, both to corroborate the assessment of roosts identified by the counter interviews and primary survey, and to determine the presence of additional roosts, where possible.
- 1.6. The study identified a total of 97 significant roost sites in the 16 WeBS Sectors between Longney Sands and Beachley Point. Of these, 30 are considered to be Primary Roost sites for the SPA, as they regularly hold more than 1% of the SPA population of one or more of the Interest Species under consideration. These species are SPA Qualifying and Assemblage Species, SSSI listed species and two additional species under consideration (Black-tailed Godwit and Golden Plover). A further 38 roost sites can be considered as Possible Primary Roost sites, as the higher end of the estimates/ counts for these roost sites exceeded 1% of the SPA population at least once during the survey period.
- 1.7. The Primary Roost sites are found (in order from upstream to downstream) within the Frampton Realignment, New Grounds Slimbridge, Berkeley Shore, Lydney Harbour Pools, Aylburton to Guscar, Oldbury and Beachley to Pillhouse Rocks Sectors. The two most important Sectors, in terms of overall bird numbers, are New Grounds Slimbridge and Aylburton to Guscar. The WWT Slimbridge reserve regularly holds the entire wintering flocks of Bewick's Swans and White-fronted Geese and the vast majority of Tufted Duck and Pochard in the SPA area that was surveyed. Aylburton Warth and Guscar Rocks probably hold almost the entire population of Curlew in the lower Severn estuary between Sharpness and Oldbury. Other Sectors that contain roosts and feeding areas that are probably crucial to the survival of some overwintering wetland birds, notably Curlew and/or Snipe, include Longney Sands, Hills Flats and Wibdon Wharf.

2.0 Introduction

Background

- 2.1. The Severn Estuary is a European Marine Site (EMS), designated as a Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar site, underpinned by the Severn Estuary Site of Special Scientific Interest (SSSI), and includes the following SSSIs: Bridgwater Bay; Flat Holm; Severn Estuary; Steep Holm; Sully Island; Upper Severn Estuary; and Penarth Coast (Stroud et al. 2001). The Severn Estuary SPA¹ is designated for six qualifying species of waterfowl and the waterfowl assemblage.
- 2.2. This report presents the findings of the fourth Phase of a wider assessment to identify roost sites in the Severn Estuary SPA and provides information on wintering waterbird high tide roosts between Beachley and Longney. Phase 1 covered Brean Down to Clevedon (Latham, 2015), Phase 2 covered Clevedon to Oldbury and Phase 3 covered Bridgwater Bay (Woodward *et. al.* 2016).
- 2.3. This phase covered the following Sectors:
- | | |
|-------|--------------------------------------|
| 14455 | River Severn at Oldbury |
| 15203 | Lydney Harbour Pools |
| 15401 | Longney Sands |
| 15402 | New Grounds Slimbridge |
| 15403 | Awre |
| 15404 | Severn - Aylburton to Guscar |
| 15405 | Severn - Wibdon Wharf |
| 15406 | Severn - Berkeley Shore |
| 15407 | Severn - Beachley to Pillhouse Rocks |
| 15408 | Severn - Lydney Marsh |
| 15409 | Severn - Purton to Naas |
| 15410 | Severn - Sharpness |
| 15411 | Severn - Purton to Brims Pill |
| 15412 | Severn - Arlingham |
| 15413 | Severn - Hills Flats |
| 15414 | Frampton Realignment |
- 2.4. Maps showing the WeBS Sectors are included in Appendix 5. All but two of the Sectors lie entirely within the county of Gloucestershire. Hills Flats is partly in Gloucestershire and partly in South Gloucestershire, whilst Oldbury is entirely within South Gloucestershire.
- 2.5. The work had four principal objectives. These were to, within the above study area:
- Capture the knowledge of local BTO WeBS counters;

¹ <http://jncc.defra.gov.uk/pdf/SPA/UK9015022.pdf>

-
- Map the roost location of the SPA birds;
 - Describe the SPA bird assemblage at each roost;
 - Record the characteristics of each roost (e.g. habitat or feature).

2.6. The findings of the project will help to inform:

- The Severn Estuary Wintering Wader Refuge Area Plan and/or other Mitigation Measures for potentially disturbing activities.
- The SSSI Detailed Notification Review (DNR) process.
- The Functionally Linked Land (FLL) map that is being developed by Natural England to identify the key foraging/supporting fields around the estuary. Fields are being prioritised according to the distance from the major bird high tide roosts.
- The Stroud District Council Recreational Strategy to meet the HRA requirements of their local planning allocations for housing development.
- The Wildfowl & Wetland Trust/ Gloucestershire Wildlife Trust proposed facilitation project to help deliver Countryside Stewardship targets within the Severn & Avon Vale with a particular focus on Curlew and Eel but will also cover all SPA birds associated with the Severn Estuary that might be using FLL.
- Future HRA's and SSSI Consents/Assents.

Species of interest

2.7. 29 species of interest were selected for study within the remit of this work. These were the SPA Qualifying Species, the SPA Assemblage Species, those listed in the SSSI citation for the estuary, two additional wader species that are part of the Non-listed waterfowl assemblage and the five regularly occurring gull species.

SPA Qualifying Species

2.8. In the most recent update of the Natura 2000 Standard data form for the Severn Estuary, submitted to the European Commission on 22/12/2015 (JNCC 2016), six species are specifically named as qualifying features (see Table 2.1 below). The Severn Estuary qualifies as an SPA as it supports important populations of these species, which are referred to in Article 4 of Directive 2009/147/EC and are listed in Annex II of Directive 92/43/EEC. Ringed plover is also included here because the 2009 advice issued under Regulation 33(2)(a) of the Conservation (Natural Habitats, &c.) Regulations 1994, as amended, lists this species as a qualifying species added during the 2001 SPA review. These species are referred to in this report as "SPA Qualifying Species".

Table 2.1 SPA qualifying species listed for the Severn Estuary on the Natura 2000 standard data form² and/or added as part of the 2001 SPA review

English name	Scientific name	Type
Gadwall	<i>Anas strepera</i>	Non-breeding population ¹
European White-fronted Goose	<i>Anser albifrons albifrons</i>	Non-breeding population ¹
Dunlin	<i>Calidris alpina alpina</i>	Non-breeding population ¹
Bewick's Swan	<i>Cygnus columbianus</i>	Non-breeding population ¹
Shelduck	<i>Tadorna tadorna</i>	Non-breeding population ¹
Redshank	<i>Tringa totanus</i>	Non-breeding population ¹
Ringed Plover	<i>Charadrius hiaticula</i>	On passage

¹ Specified as 'wintering' on the Natura 2000 data form, but the term "non-breeding" is now preferred, e.g. on the Site Conservation Objectives (Natural England, 2016a).

SPA Species Assemblage

- 2.9. In addition, the Severn Estuary is also notified as a SPA as a result of the "waterfowl assemblage", as it regularly supports more than 20,000 individuals. On the most recent Natura 2000 standard data form³, the waterfowl assemblage population size was stated as 84,317.
- 2.10. The most recent form does not include a list of species which make up the waterfowl assemblage for the Severn Estuary. However, the 2001 SPA Review (Stroud et al. 2001) listed 11 additional species (see Table 2.2 below), which are referred to in this report as "SPA Waterfowl Assemblage Species".

Table 2.2 SPA Waterfowl Assemblage Species listed for the Severn Estuary by the 2001 SPA Review⁴

English Name	Scientific name
Wigeon	<i>Anas penelope</i>
Teal	<i>Anas crecca</i>
Mallard	<i>Anas platyrhynchos</i>
Pintail	<i>Anas acuta</i>
Shoveler	<i>Anas clypeata</i>
Pochard	<i>Aythya ferina</i>
Tufted Duck	<i>Aythya fuligula</i>
Grey Plover	<i>Pluvialis squatarola</i>
Lapwing	<i>Vanellus vanellus</i>
Whimbrel	<i>Numenius phaeopus</i>
Curlew	<i>Numenius arquata</i>
Spotted Redshank	<i>Tringa erythropus</i>

SSSI Species

- 2.11. The SSSI citations for the Severn Estuary and the Upper Severn Estuary⁵ specifically list a number of species of interest (Table 2.3).

² <http://jncc.defra.gov.uk/pdf/SPA/UK9015022.pdf>

³ <http://jncc.defra.gov.uk/pdf/SPA/UK9015022.pdf>

⁴ Stroud et al. (2001)

Table 2.3 Species listed in the Severn Estuary SSSI citations

English Name	Scientific name	Severn Estuary SSSI	Upper Severn Estuary SSSI
Bewick's swan	<i>Cygnus columbianus</i>		✓
European White-fronted Goose	<i>Anser albifrons albifrons</i>		✓
Lesser White-fronted Goose	<i>Anser erythropus</i>		✓
Pink-footed Goose	<i>Anser brachyrhynchus</i>		✓
Shelduck	<i>Tadorna tadorna</i>	✓	
Gadwall	<i>Anas strepera</i>		✓
Shoveler	<i>Anas clypeata</i>		✓
Pochard	<i>Aythya ferina</i>		✓
Wigeon	<i>Anas penelope</i>	✓	✓
Teal	<i>Anas crecca</i>		✓
Mallard	<i>Anas platyrhynchos</i>		✓
Pintail	<i>Anas acuta</i>		✓
Tufted Duck	<i>Aythya fuligula</i>		✓
Grey Plover	<i>Pluvialis squatarola</i>	✓	
Ringed Plover	<i>Charadrius hiaticula</i>	✓	
Whimbrel	<i>Numenius phaeopus</i>	✓	
Curlew	<i>Numenius arquata</i>	✓	✓
Turnstone	<i>Arenaria interpres</i>	✓	
Knot	<i>Calidris canutus</i>	✓	
Dunlin	<i>Calidris alpina alpina</i>	✓	✓
Redshank	<i>Tringa totanus</i>	✓	✓
Snipe	<i>Gallinago gallinago</i>	✓	✓

Non-listed waterfowl assemblage species

- 2.12. The waterfowl assemblage includes any native waterfowl species that are present at a site (non-native waterfowl are normally excluded, and gulls are also excluded from the WeBS waterfowl assemblage calculations as counting of gulls is optional in WeBS). Other species which are not specifically listed as part of the waterfowl assemblage in the SPA citations have also been recorded as part of the roost site assemblage in this report, where they occur in association with SPA and/ or SSSI species. A full list of species using each roost site is included in the tables relating to the site. These can be found in either the body of the report or, in the case of 15402 New Grounds, Slimbridge, in Appendix 4.
- 2.13. Black-tailed Godwit and Golden Plover were selected from the non-listed waterfowl assemblage species list for particular consideration because they are two species that have increased in number locally in recent years - this has been remarked on particularly for the Wildfowl and Wetlands Trust (WWT) Slimbridge reserve (Smart, 2012 and Kirk and Phillips, 2013). They were chosen to provide an illustration of the importance of the estuary for non-listed species. Others could have been chosen (e.g. avocet) but it was not within the brief of the work to undertake an exhaustive examination of the significance of roosts for all species in the wetland bird assemblage.

⁵ http://www.sssi.naturalengland.org.uk/citation/citation_photo/1002284.pdf

3.0 Definition of terms

Definition of a roost

- 3.1. In the context of a tidal ecosystem, a roost site is generally considered to be a place where birds congregate when feeding on intertidal mud or other estuarine habitats is not possible due to the depth of water. In many cases, birds will be at rest, but not if other non-estuarine feeding habitats are available to them. Such habitats may only be available at certain times (e.g. in mid to late winter when fields are wet enough for waders to probe the ground).
- 3.2. There are also a number of water bird species under consideration that are not strictly dependent on intertidal habitats, e.g. the diving ducks (Pochard and Tufted Duck) and the grazing wildfowl such as Bewick's Swan, White-fronted Goose and Wigeon. Roosting birds of these species are unlikely to be encountered strictly as a result of the state of the tide, but they will be found in feeding flocks at high tide and may rest (roosting in its strictest definition) at other times of the day. It may therefore be more accurate to describe roosts for the species assemblage under consideration as places where birds regularly congregate, but do not necessarily rest, at high tide. Roosts may also be found at other times in the tidal cycle, or in response to other cycles, such as day and night.
- 3.3. There are a number of examples of dynamic behaviour of birds on the Severn (as on many other estuaries) that is influenced by the tides but which is not entirely dictated by them. As is well known, the height of the tide can vary considerably between spring and neap tides, with a correspondingly variable amount of exposed mud remaining at high tide that may allow birds to continue to feed. Curlew, for example, will congregate to rest and feed on intertidal mud (if still exposed), saltmarsh and higher ground between the high water mark and the sea defences that have been built alongside the estuary. They will also fly inland to feed, most notably (but not exclusively) at high tide when opportunities to do so present themselves⁶. In winter, Golden Plover (and to a lesser extent, Lapwing) roost on or near to the estuary and could fly inland as far as areas on the Cotswold escarpment or further upstream in the non-tidal floodplain of the Severn. Whether or not there is regular interchange of birds between the two areas has not been determined but it is considered to be likely (Smart, 2012). More obvious links between designated and un-designated land in the study area have been found along the estuary. An example is at Awre, where studies in connection with a solar farm proposal found SPA species outside of the SPA. Similarly, lapwing were noted in fields adjacent to Sharpness during studies relating to a proposal for a distribution centre. These areas, as well as others along the estuary and beyond (see the findings of this report) that are outside of the SPA but which are used by SPA bird populations, are all examples of Functionally Linked Land, a subject area of considerable concern in spatial planning (see for example NE Commissioned Report 207 and RSPB 2004).
- 3.4. Golden Plover and Lapwing movements may be less dependent on the state of the tides and more dependent on changes in:
 - The weather. Frozen conditions may render inland feeding areas inaccessible to feeding waders throughout the tidal cycle;

⁶ John Sanders and Mike Smart, personal communication; personal observations.

-
- Availability of foraging areas. It has been suggested that mild winters promoting rapid growth of autumn sown cereals may lead to crops being too tall for Lapwing and Golden Plover to feed on, resulting in a greater dependency on estuarine mud (Mason and MacDonald, 1999);
 - Disturbance. The Severn Way footpath extends along much of the estuary on the east bank and there are numerous rights of way or unofficial/unauthorised access routes frequently used on the rest of the estuary, with a number of dogs off the lead particularly likely to disturb roosting and feeding birds. Other activities likely to periodically influence where roosts are include angling, wildfowling, boat and aircraft movements and agricultural activity;
 - Predation. For example, sustained harassment of wintering flocks by peregrines (*Falco peregrinus*) have been observed apparently to result in the departure, for some time, of Golden Plover from the Wildfowl and Wetlands Trust (WWT) Slimbridge reserve (Smart, 2012); and
 - Phases of the moon - a full moon and/or cloudless conditions allow feeding to take place at night (Gillings and Fuller 1999).
- 3.5. In consideration of the above, the definition of a roost has, for the purposes of this report, been determined to be *a place where birds regularly settle or congregate, most notably (but not exclusively) at high tide*. Whilst it is clear that the intention of the study is to identify important high tide roosts, this looser definition allows for a more comprehensive description of areas on or adjacent to the estuary that are of importance to the SPA waterbird assemblage. Identification and description of roosts further inland from the floodplain of the estuary is beyond the remit of the work reported on here.

Definition of other terms

- 3.6. The Guidance on WeBS data release⁷ states that “The year is divided into three functional counting seasons: Autumn (July to October inclusive to describe autumn passage); Winter (November to March inclusive to describe the wintering population) and Spring (April to June inclusive to describe spring passage)”. Wherever winter, autumn and spring are referred to in this report, these are the periods referred to.
- 3.7. It should be noted that although autumn and spring periods are generally described as “passage” periods, Curlew may begin to arrive and establish non-breeding populations that remain through the winter from as early as the first week of June, with birds beginning to depart for breeding grounds as early as February. Scandinavian birds depart as late as the third week in April⁸. Clearly, demarcation of the seasons as described by WeBS is not always strictly applicable to actual bird movements.

⁷ <https://www.bto.org/volunteer-surveys/webs/data/submit-data-request>

⁸ John Sanders, personal communication

4.0 Methods

Desk Study

- 4.1. A data request for records of wetland bird species recorded within Gloucestershire over the last 5 years (to March 2017) was made to the County Bird Recorder, Richard Baatsen (hereafter referred to as the Gloucestershire [County Wetland Birds] Data Set or GDS). The intention was to determine whether or not the data gathered by primary survey in September 2016 to March 2017 was representative of the roosting behaviour of the SPA species that have been observed at other times. Not all recorders noted what birds were doing when they were seen. However, certain broad inferences about roosting birds were apparent with some records and these are reported on where appropriate.
- 4.2. WWT Slimbridge holds its own data set for WeBS counts on the reserve, with counts broken down into sub-sections of the reserve. This was examined to determine uses of the sub-sections of the site by the species under consideration as an additional exercise to the counter interview methods (see below).
- 4.3. An unpublished data set for the period June 2016 to May 2017, generated by Mr. John Sanders, a local ornithologist researching curlew movements between the M48 bridge and Rodley, was made available to the author of this report. This provided additional data on the importance of the sectors within Phase 4 and is reported on where appropriate. Detailed analysis of these records was not attempted. This will be done in due course by the originator of the records, along with analysis of work done since 2010, when John began his study.

Classification of Primary Roost sites (SPA and non-SPA Primary Roosts)

- 4.4. Roost sites identified by this study have been classified as Primary Roosts if they regularly (i.e. presence is 50% or more) hold more than 1% of the SPA population of one or more of the species listed in the tables below. This assessment follows that set out in Woodward *et. al.* (2016), although equal weighting is given to SPA and SSSI species, as well as the two additional species of interest that are not included in either list. Reasons for inclusion are given below.
- 4.5. The Primary Roost criteria were applied to counted and un-counted Sectors but using different sources of data. For the Berkeley Shore and Oldbury counted Sectors, the range of values given by the interviewees was compared to existing data sets submitted to WeBS over the previous 5 years. New Grounds, Slimbridge is monitored far more regularly than the first two counted Sectors and therefore a great deal is known about bird movements and patterns of occupancy of roosts. This was taken into account when determining the status of a roost and is explained in detail in the Results section of this report.
- 4.6. For the un-counted Sectors, the range of values over the seven months' worth of survey was examined, i.e. presence exceeded the 50% threshold described above if birds were found on four or more surveys. In addition, however, the desk study data was used to infer any greater or lesser importance to all of the Sectors wherever possible.

- 4.7. The SPA population is based on the most recent five year Mean peak counts for the Severn Estuary SPA, covering 2010/11 to 2014/15 (Frost et al. 2016). The population figures used are shown in Table 4.1 below.

Table 4.1: Five year Mean peak counts for the Severn Estuary SPA (2010/11 to 2014/15), used to identify SPA Primary Roost sites

Species	Five Year Mean Peak (Severn Estuary SPA)	1% Severn Estuary SPA
Bewick's Swan	222	2
European White-fronted Goose	289	3
Shelduck	3,570	36
Wigeon	7,220	72
Gadwall	208	2
Teal	6,182	62
Mallard	2,847	28
Pintail	560	6
Shoveler	483	5
Pochard	471	5
Tufted Duck	793	8
Grey Plover	318	3
Ringed Plover	1,315	13
Lapwing	10,485	105
Curlew	3,654	37
Whimbrel	192	2
Dunlin	25,220	252
Redshank	3,995	40
Spotted Redshank	10	1

- 4.8. Additional consideration has been given to the other species named in the SSSI citations (Turnstone, Knot and Snipe) and two of the species which are considered to have increased in number on the estuary in recent years. These latter species are Black-tailed Godwit and Golden Plover. The additional species considered are shown in Table 4.2 below:

Table 4.2: Five year Mean peak counts for the Severn Estuary SSSI and for Black-tailed Godwit and Golden Plover (2010/11 to 2014/15), used to identify non-SPA Primary Roost sites.

Species	Five Year Mean Peak (Severn Estuary SPA)	1% Severn Estuary SPA
Turnstone (SSSI)	464	5
Knot (SSSI)	2104	21
Snipe (SSSI)	165	2
Black-tailed Godwit (additional)	643	6
Golden Plover (additional)	3666	37

- 4.9. Collectively, the 24 species listed above are referred to in this report as *Interest Species*.

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- 4.10. Sites surveyed in September 2016 to March 2017 are also classed as Possible Primary Roosts when the count exceeded the threshold for a Primary Roost on at least one occasion, but the species was not regularly present (i.e. presence is < 50%).
- 4.11. Passage roost sites have been identified in some cases, based on comments made by the counters, or information gleaned from desk study data giving a peak estimate for a species during spring and/or autumn passage. If specific information about the passage period has been obtained, these sites are defined as Primary Roost (passage) or a Possible Primary Roost (passage) based on the estimates and % presence values for the passage period only. In the absence of any specific % presence information for the passage period, these roosts are defined as a Possible Primary Roost (passage) if the peak estimate exceeds 1% of the SPA population of one or more of the listed species during that time of the year.
- 4.12. Other categories of SPA/ SSSI roost that were identified included the following:
- Non-Primary Roosts - all locations where roosting birds were found but where numbers were below the 1% SPA population threshold; and
 - Historic Primary and Possible Primary Roosts. These were sites identified by the counters or by desk study information to have met the criteria described above in the past but which are no longer used, or no longer occupied by significant numbers of roosting birds, or are no longer used at all.

Identification of other roost types

- 4.13. It was a specific requirement of Natural England that all gull roosts should be identified and mapped. Gulls are therefore included in the list of Interest Species. However, the 1% SPA population threshold criterion described above was not applicable to gulls because they are not part of the Qualifying Assemblage. The relative importance of gull roosts was therefore not assessed in this way.

Counted Sectors

- 4.14. Natural England identified three WeBS counting Sectors that are regularly counted by volunteer surveyors, who submit results to the British Trust for Ornithology (BTO). These were:
- 14455 River Severn at Oldbury
 - 15402 New Grounds, Slimbridge
 - 15406 Severn - Berkeley Shore
- 4.15. To capture the local knowledge of the counters, the following methods were used:
- Engagement via a face-to-face interview with the local WeBS counters with the aim of collecting information on roost site locations, assemblages and their characteristics.
 - Site visits during the winter WeBS counts (September 2016 to March 2017) in order to ground-truth the information provided by the counters, to obtain Global Positioning System (GPS) locations, and to identify roost habitat.

4.16. During the interviews, the location of current and historic roost locations were mapped, and we collected information about bird assemblages and physical characteristics of the roost sites, using a set of interview questions which were used by the BTO study of 2016. During the site visits, a similar form was used to ground truth the roost location information and record the number of birds using the roost site on the day of the visit. A GPS grid reference was taken where appropriate, i.e. where the roost site was accessible and where the roost location could not be clearly identified and mapped using geographical features. Copies of the interview and site visit forms are attached as Appendix 3.

4.17. The following information was collected for each roost:

SPA bird assemblage at each roost

4.18. Working with the local WeBS counters, information about the species assemblage at roost sites within count Sectors was captured and ground-truthed. Counters were asked to assess the numbers using each roost site during typical tides and peak tides, expressed as either an average (where numbers are relatively stable) or a range.

Nature of the roost sites (e.g. habitat or feature)

4.19. The Severn Estuary WeBS counters have local knowledge of the physical nature of the identified roost sites. During the interview and site visits, we thus also captured information about the habitat and features associated with each high tide roost.

Other information

4.20. Additional information about the roost site was also collected during the interview and site visit. In particular, counters were asked about patterns of variability in numbers using the roost site, for example whether numbers varied between spring and neap tides or during different seasons, and about types of disturbance that occur at the site. It has not been possible to ground truth this information and any information in this report is based on the responses given by the counters and may not necessarily be comprehensive. Any comments relating to the frequency of disturbance are subjective assessments made by the counters and are not based on an objective scale; therefore comparison of such frequencies between different sites may not be valid.

4.21. Where desk study data corroborated the findings of the surveys, or if they suggested that the sites were potentially more or less important than was inferred by the primary surveys, this is stated. For counted Sectors, desk study data were obtained for Berkeley Shore and New Grounds, Slimbridge only.

Additional data analysis for Sector 15402 - New Grounds, Slimbridge

4.22. Given the major importance of WWT Slimbridge to the SPA Qualifying and Assemblage species, more in-depth analysis of the numbers of birds occurring within the reserve at high tide was considered appropriate. To this end, data on counts within the sub-sections of New Grounds, Slimbridge (WWT Slimbridge) were provided by Martin McGill, Senior Reserve Warden and WeBS counter for the Sector. These data covered the period January 2011 to February 2017. Data for sub-sections of the Sector for the months of May and August 2011, June 2012 and April 2013 were not available, so the total number of months' data provided in this format was 70. For

all counts combined (totals sent to WeBS), June 2012 was included so the number of months of pooled data supplied was 71.

- 4.23. Whilst the data supplied by WWT did not specify what birds were doing (roosting or not roosting), the broad definition of a roost suggested in Section 3 of this report was applied to the data i.e. at high tide, all birds present were deemed to be roosting or otherwise congregating in non-tidal habitats, or in limited areas of tidal habitat that were not covered by the high tide at the time.
- 4.24. The percentage occupancy of the sub-sections of this Sector by all wetland bird assemblage species was determined. From this, the frequency at which the 1% threshold for the SPA/ SSSI/ additional species populations was met or exceeded over these months was calculated in order to determine whether or not they could be considered to be Primary Roost sites. Pooled data for the whole site was examined to determine whether or not, even if individual sub-sections did not meet the Primary Roost criteria, WWT Slimbridge and the river frontage onto the estuary as a whole could be considered to be a Primary Roost for these species. This was considered important for species that may use large areas of the reserve but only occur in certain sub-sections intermittently.
- 4.25. Having generated the results of these calculations, additional consultation with Martin McGill was entered into to ensure that the interpretation of the figures aligned with his perception of what the birds were doing at high tide through the period in which each species was present on the reserve.
- 4.26. 11 important species did not occur year-round. These were Bewick's Swan, European White-fronted Goose, Pintail, Grey Plover, Ringed Plover, Whimbrel, Spotted Redshank, Turnstone, Knot, Snipe and Golden Plover. Data manipulation to take account of this was considered necessary in order to determine more accurately the importance of the Sector for these species. The criterion that occupancy at the 1% threshold or above for 50% of surveys qualified a site to be a Primary Roost, as set out by the BTO (2016), did not take account of the seasonal occurrence of these species, so percentage occupancy was treated differently for them.
- 4.27. For species occurring in each month of the year at Slimbridge, the percentage occupancy was calculated using the following formula:
- $$\% \text{ presence} = (\text{no. months present in sub-Sector}) / 70 \text{ months of data} \times (100/1)$$
- 4.28. For the 11 species that were present for fewer than 12 months of the year at Slimbridge, the formula was:
- $$\% \text{ presence} = (\text{no. months present in sub-Sector}) / (\text{range of months where birds were present in the last 5 years}) \times \text{no. of these months for which counts were carried out} \times (100/1)$$
- 4.29. To illustrate this second calculation, the example of Bewick's Swan is given here. Between January 2011 and February 2017, this species has been recorded at Slimbridge in six months of the year – October to March. Counts were carried out in these six months of the year a total of 38 times, so the percentage occupancy of each sub-Sector was calculated using:
- $$\% \text{ presence} = (\text{no. months present in sub-Sector}) / 38 \times (100/1)$$

To take the example of the 100/50 Acre sub-section, Bewick's Swans were recorded at or above the 1% SPA threshold population (in this case, only two birds) during only one count, making 2% presence over the recording period. Therefore, the sub-section did not qualify as a Primary Roost. However, the site as a whole does qualify because the 1% SPA threshold population was equalled or exceeded 32 times, making 84% presence over the recording period. Further detail on this is given in the Results section below.

Limitations

- 4.30. Although counters were asked to identify all roost sites within their Sector, the perception of what may constitute a roost site may vary according to the number of birds normally present and according to the perceived behaviour of birds at the roost. The standard questionnaire makes reference to roosting, feeding, bathing and preening as "expected" behaviours of birds at a roost. As identified in paragraphs above, this indicates that the definition of a roost could be a broader one than may ordinarily be considered to be the case. This was discussed with the counters during the interview but there may be some minor inconsistencies of perception.
- 4.31. Roost sites containing low numbers of birds have been recorded and highlighted within Sectors with lower overall numbers. At WWT Slimbridge, with many more birds, many small "roosts" of this size may exist, but have not necessarily been identified specifically as roost sites. However the detailed analysis of the sub-sections of the New Grounds Sector and the additional consultation with the WeBS counter was designed to fully explore the importance of WWT Slimbridge and the area around it.
- 4.32. Limitations to the approach to the data for WWT Slimbridge were identified. The broad definition of roosting could not take account of the fact that counts can be carried out between two hours either side of high tide. This meant that birds continuing to feed on the estuary itself could not be determined. However, significant numbers of certain species were regularly or intermittently noted on the river at certain times of the year, including Wigeon, Pintail, Shelduck, and Curlew. Wildfowl were thought likely to be "roosting" on open slack water around the accreting saltmarsh, centred on NGR SO706049, as the tide came in, as had been seen from the Purton to Brims Pill Sector, whereas the behaviour of waders was likely to have been more fluid according to the amount of mud exposed at the time of the count. Where such large numbers were noted, the likely behaviour of these birds at the time of recording was determined with Martin McGill.
- 4.33. We are confident that this approach will have identified all the major roost sites in the areas of interest in all Sectors, as in most cases the WeBS Sectors were fully accessible.

Uncounted Sectors

- 4.34. WeBS visits are undertaken by volunteers. However, coverage is incomplete for this part of the Severn Estuary, and the following Sectors of interest are currently not covered by WeBS volunteers:

15203	Lydney Harbour Pools
15401	Longney Sands
15403	Awre

15404	Severn - Aylburton to Guscar
15405	Severn - Wibdon Wharf
15407	Severn - Beachley to Pillhouse Rocks
15408	Severn - Lydney Marsh
15409	Severn - Purton to Naas
15410	Severn - Sharpness
15411	Severn - Purton to Brims Pill
15412	Severn - Arlingham
15413	Severn - Hills Flats
15414	Frampton Realignment

4.35. For these Sectors, monthly visits were made between September 2016 and March 2017. This was to undertake surveys following WeBS survey methodology⁹, to record all waterbirds (including gulls and terns) and map the location of sightings and the activity of the birds (e.g. roosting, feeding), to identify roost locations and habitat characteristics, and to obtain GPS locations. As above, information was collected in relation to specific objectives, in this case as follows:

- To identify the locations of wintering waterbird high tide roosts;
- To describe the SPA bird assemblage at each roost;
- To record the nature of the roost sites (e.g. habitat or feature);

4.36. The bird assemblage for these Sectors is therefore based on the species observed at identified roost sites on survey visits made between September 2016 and March 2017, and the % presence is calculated as the percentage of occasions on which this species was present during these seven visits.

4.37. As a result of the constraints brought about by the reduced survey period for the “uncounted” Sectors, the information provided may not capture any variability in roost numbers that may occur between winters, and does not capture potential usage of these sites during passage. However, where a Sector has been covered by WeBS counters within the last five years, the species assemblage information gathered in the period September 2016 to March 2017 was compared with the combined assemblage information for all roosts for the Sector with the most recent WeBS counts data available (20010/11-2014/15). Where there are substantial differences, this is highlighted in the report.

Other information

4.38. Where desk study data corroborated the findings of the surveys, or if they suggested that the sites were potentially more or less important than was inferred by the primary surveys, this is stated.

⁹ <http://www.bto.org/volunteer-surveys/webs/taking-part/core-counts-methods>

Limitations

- 4.39. The tidal range on the Severn is large, and some of the WeBS counts carried out by Link Ecology surveyors were carried out during tides which were not particularly high. During these visits, the mud at the edge of the WeBS Sectors was only covered up for a very short period either side of high tide. In many cases, small numbers of birds use these areas of mud across much of the high tide period and therefore it should be borne in mind that the distribution of birds using the Sector at high tide can sometimes be much more widespread than suggested by the roost site maps.
- 4.40. The majority of Desk Study records do not represent the results of systematic surveys, where nil counts would not have been reported. It is therefore not possible to determine the survey effort represented by the records and only broad interpretations of them can be made.

Data presentation

Mapping of roost sites

- 4.41. The Severn Estuary has a large tidal range, and the observations made during WeBS counts and site visits suggested that areas of mud were often available away from the main roost sites close to the high tide period on neap tides in some Sectors. Therefore, on certain high tides birds may sometimes use a much wider or a much smaller area than shown by the roost site maps.
- 4.42. Significant roosts (Primary, Possible Primary and recurrent non-Primary roosts, as well as recurrent gull-only roosts) identified by field work or the counter interviews were mapped. The approximate extent of the roost sites that is given on the maps was determined in two ways. For the counted Sectors, the opinion of the counter interviewed was sought and a polygon representing the maximum extent of the roosts was drawn. For the uncounted Sectors, the shape and size of the polygons was determined by the distribution of target noted counts from different surveys, with clustered records taken to indicate the existence of a single roost that was not located exactly in the same location on each survey. This approach required a qualitative assessment of likely associations between groups of birds on different dates and it did not take account of the extent of similar habitat located adjacent to the roost sites which could support roosting birds of the same species/ species assemblage. An example of this is common Snipe at Aylburton Warth. The polygon shown indicates the maximum area over which this species was observed, but it is likely that a much wider area of habitat capable of supporting this species (in this case, saltmarsh) was being used.
- 4.43. Classification and mapping of Primary and non-Primary roosts at WWT Slimbridge was largely determined according to discussion with Martin McGill. Application of the Primary Roost criteria in this Sector was found to generally under-value parts of the site. Where Martin's opinion differed from the results of the data analysis that was done, the classification shown on the maps is explained in the Results section of this report.
- 4.44. Large numbers of gulls and lower numbers of wildfowl were observed being carried up river with the incoming tide in a number of Sectors. Given that these birds were at rest, they were considered to be roosting. However, the locations of such roosts changed sufficiently rapidly that mapping of them was not considered worthwhile. However, where such observations were made, they are noted in the text of the Results section. Roosts observed on open water where birds remained *in situ* for some time were mapped.

Tabular presentation of data

- 4.45. Species assemblages at each significant Interest Species roost are presented in tables in the body of the text and, in the case of Sector 15402 New Grounds, Slimbridge, also in Appendix 4. Species are listed in systematic order irrespective of whether they are Interest Species.
- 4.46. Roost types are presented as follows:
- Wader only
 - Wildfowl only
 - Wildfowl and waders
 - Wildfowl, waders and gulls
 - Mixed – other wetland birds were present in addition to wildfowl, waders and/or gulls
- 4.47. All roosts are presented in order from upstream to downstream.

Terms used

- 4.48. The convention adopted by the Environment Agency for description of river bank sides is used in this report. Hence, where reference is made to the “left bank” this means the bank on the left side when looking downstream from any point on the river. The “right bank” is on the right hand side when looking downstream. In the context of the Severn estuary, the Forest of Dean District is on the right bank whereas Stroud District and South Gloucestershire are on the left bank.

5.0 Results

- 5.1. The results of the counter interviews and the field surveys are given for Sectors in order of upstream to downstream, as set out below. All weather and tidal conditions affecting the accuracy of the surveys are given in Appendix 1. The desk study results are presented in full in Appendix 2, with commentary on their relevance to the objectives of the project given in this section of the report where appropriate.
- 5.2. “% presence at roost site” given in tables describing roosts within un-counted Sectors are as set out in Table 5.1 below. Percentage presence at a roost site is given as the nearest whole number.

Table 5.1: % presence at roost sites for uncounted Sectors

Number of surveys in which species was present	% presence at roost sites
1	14
2	29
3	43
4	57
5	71
6	86
7	100

15401 Longney Sands – Uncounted Sector

General description

- 5.3. This Sector covers an area between SO752127 and SO732114, with the villages of Longney, Epney and Upper Framilode on the left bank and Rodley on the right bank. The WeBS Sector itself is limited to the river channel, but the surveys included fields inland of the river that were within view of the surveyors. Within this wider area, former floodplain now lies largely inland of flood banks and land use is predominantly arable. Maize production (presumably for animal feed) appeared to be the most favoured crop. Loss of orchards and hedgerows from the area was noted from differences between the 1:25000 Ordnance Survey (OS) map and conditions on the ground. There are some improved, and some unimproved, grassland fields that are grazed by livestock on the right bank.
- 5.4. Also on the right bank is a wide area of remaining floodplain in a bend in the river, at the north east end of Upper Dumball. This area is laid to grass. Whether or not this was an improved sward could not be determined but it appeared to be mown, possibly with aftermath grazing. No livestock was noted during the survey period but desk study records suggest that it is grazed by sheep and cattle at other times of the year. The area floods, but apparently not regularly, due to the lack of trash lines that are formed from material brought in by the tide and which were noted on exposed sand and mud on the river. However, there is often a large shallow pool on the field close to the bend of the river (approx. NGR SO760116) and this is topped up in winter by the higher incoming tides.
- 5.5. A strip of rank un-grazed grassland is found along the river’s edge on the right bank. This ranges in width from 2 to 10m approximately. A reedbed is also present on the upstream end of this Sector on the same bank.

- 5.6. The flood defences on the left bank of the river include vegetated embankments and flood walls to protect properties in close proximity to the river. There is a section at the downstream end that is undefended. Here, the floodplain is naturally limited by rising hillsides.
- 5.7. The tidal river within this Sector has large areas of mud and sand exposed at low tide. It should be noted that mud is accreting on the right bank of the river just upstream of Longney Crib, with a channel developing between the Sands and the left bank. The channel shown on the OS map is therefore inaccurate.
- 5.8. This Sector contains sites that are given various names by recorders on the GDS. The upstream end of the area on the OS map named Upper Dumball has been referred to as Longney Crib (this is actually on the opposite bank of the river) and Longney Point. Locations on lower reaches of the Sector are given as Framilode Passage, Priding, Blueboys Farm and Lower Dumball. Wider references are also made to Epney, Longney, Longney Sands etc. Therefore, some interpretation of records was required.

Roosting birds

- 5.9. Within this Sector, eight roosts of significant Interest Species assemblages were identified. These are listed in Table 5.2 below.
- 5.10. During primary surveys, the mud and sand banks on this Sector were found to attract large numbers of gulls at low tide, as well as low numbers of Shelduck and Mallard. Single occurrences of flocks of waders included Curlew, Lapwing and Golden Plover. Large flocks of Canada geese were also noted. Birds in these areas were only displaced when the tide came in, some 40 minutes or so after the predicted high tide at Sharpness. When displacement occurred, gulls often flew to the wide bay at the upstream end, marked on the OS map as Longney Sands, where they would sit on the water or fly in restless flocks over the river.
- 5.11. Habitat inland of the mean high tide line was frequently occupied by roosting and feeding waders, most consistently Curlew, but also Lapwing and Golden Plover. There were also notable single occurrences of low numbers Bewick's and Whooper Swans.

Table 5.2: Roost sites in Sector 15401 - Longney Sands

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
1	Longney Sands	SO7576611839	Mixed	Sandflats, mudflats and open water depending on the state of the tide	No
2	Rodley shore	SO7525512030	Mixed	Sandflats, rough and improved (grazed) grassland with reedbed	Possible
3	Upper Dumball North	SO7593511485	Mixed	Grazed field on the estuary side of the flood bank.	No
4	Upper Dumball South	SO7559110966	Gull only	Sandflats, mudflats and improved fields above.	-
5	Priding Sandflats	SO7381211020	Mixed	Sandflats and mudflats	No
6	Court Farm meadow	SO7382411489	Mixed	Ridge and furrow meadow.	Possible

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
7	Blueboys Farm meadow	SO7424011082	Waders and gulls	Ridge and furrow meadow. Main interest is likely to be for Curlew	Possible
8	Hill Farm	SO7483611715	Wader	Curlew feeding area/ roost on improved grassland field	Possible

Roost 1

- 5.12. This site, covering Longney Sands as shown on the OS map, is at the upstream end of the Sector. It had varying numbers of gulls and low numbers of other species roosting on exposed sand at low tide, with birds accumulating on open water as the tide came in. Mallard occurred in low numbers sheltering in the slack water just upstream of Longney Crib.
- 5.13. Observations suggested that many of the gulls roosting further downstream, within the same Sector or the next Sector, 15412 (Arlingham) were either carried upstream on the tide or flew to this area when exposed mud and sand was covered. These birds then dispersed back downstream or inland as the tide receded.
- 5.14. GDS records suggest that wildfowl numbers fluctuate widely within this area. Species that have occurred in numbers equalling or exceeding the 1% SPA population threshold for Primary Roosts included Wigeon, Mallard and Shoveler. Curlew counts by John Sanders at Longney Sands in October 2016 exceeded the 1% threshold on two occasions. At times, therefore, Longney Sands may be of greater importance than that indicated by the primary surveys.
- 5.15. Species on the GDS for which counts did not equal or exceed the 1% SPA population threshold for Primary Roosts included Shelduck, Teal and Redshank.

Table 5.3: Species assemblage at Roost 15401-1, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Canada Goose				0-200	14	-	
Barnacle Goose				0-50	14	-	
Mallard		Y		0-10	14	No	
Cormorant				0-10	71	-	
Grey heron				0-3	29	-	
Oystercatcher				0-1	14	-	
Black-headed Gull				5-3000	100	-	
Common Gull				0-600	43	-	
Lesser Black-backed Gull				2-100	100	-	
Herring Gull				0-600	71	-	
Great Black-backed Gull				0-10	86	-	

- 5.16. Longney Sands is one of two shooting areas within the Sector¹⁰ that are controlled by the Gloucestershire Wildfowlers Association (GWA), with established locations for shooters on the right bank of the river on the edge of a strip of reedbed centred on SO753119 approximately. Two wildfowlers were observed here during the October survey. One was using 3 Mallard decoys. A shot was fired and there was localised disturbance of Mallard, but no adverse effects on roosting birds nearby were noted.
- 5.17. Areas used by birds within this roost site are sufficiently far from public rights of way for disturbance from people and dogs to be insignificant.
- 5.18. In October 2016, a drone was being flown over the Anchor pub throughout the survey but this was relatively stationary and did not disturb the birds. This kind of activity may be more intrusive at other times.

Roost 2

- 5.19. This roost consisted of a wide foreshore of sand and mud that was covered at high tide, with higher ground covered by reedbed, a rough un-grazed grassland strip and grazed grassland that was thought likely to comprise of an improved sward. The main reason for grouping these habitats was the observed behaviour of Curlew. A roosting flock was noted on the exposed sand bank on one occasion within this area. This was displaced to the grassland foreshore as the tide came in. On another survey, 17 birds were noted in the same place. The main likely importance of the roost, however, was considered to be for Snipe. The reedbed and rough grassland strip habitats were occupied by varying numbers of this species, with birds flushed by the surveyor on four of the surveys. As fewer individuals than the 1% SPA population threshold (2 birds) were seen on two of these surveys and none were seen on the other three surveys, the area could not be classified as a Primary Roost. However, as is often the case with this species, the counts were probably an under-estimate and the area of the roost was probably much greater than that which could be mapped on the basis of the sightings made. The rank grassland and reedbed habitat in which the birds were found was available within a long section of the river bank upstream and downstream.
- 5.20. The rank grassland and reedbed showed signs of being crossed on a regular basis by wildfowlers accessing the river frontage. Relatively recently-dug ponds and scrapes were noted and, notwithstanding periodic disturbance from the wildfowlers, these were thought likely to encourage occupancy by Snipe.

Table 5.4: Species assemblage at Roost 15401-2, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Little Egret				0-2	43	-	
Grey Heron				0-3	14	-	
Lapwing		Y		0-18	14	No	
Snipe			Y	0-13	57	Possible	A likely under-count
Curlew		Y	Y	0-34	29	No	

¹⁰ Locations and extent of wildfowl shooting and no-shooting areas was obtained from a map supplied by the British Association for Shooting and Conservation (BASC) to Natural England.

Roost 3

- 5.21. This site, covering the north end of Upper Dumball, is composed primarily of grazed semi-improved and possibly unimproved grassland that is subject to periodic flooding on very high tides. During the 2016-17 surveys, this field was host to varying numbers of wetland birds. It contained a shallow waterbody that attracted waders and wildfowl, whilst gulls roosted in the wider area of the field.
- 5.22. Desk study records indicate that a wider area of Upper Dumball North than that which is mapped should be considered to be part of the roost site, including the south end of Upper Dumball which is described separately below as Roost 4. The following references to the GDS apply equally to the two roost sites identified by the primary surveys carried out for this study because it is not clear from the detail in the database which specific area the counts were made in, or indeed if there is a real distinction between them. For this reason, the desk study data are not described again for Roost 4.
- 5.23. Of the Interest Species, only Snipe were found in a number at the 1% SPA population threshold during the 2016-17 surveys, but the single count was not enough for the site to qualify as a Primary Roost. However, the GDS records suggest that this is indeed a Primary Roost for Snipe, with 10 of 13 counts submitted that exceeded the 1% threshold recorded at Upper Dumball.
- 5.24. One count of Curlew during the primary surveys approached the 1% threshold for that species and again the GDS records suggest that Upper Dumball could be a Primary Roost during autumn passage and during the winter. Numbers of Curlew have been recorded in autumn between 35 and 80 and in winter between 55 and 180.
- 5.25. Other GDS counts of some Interest Species equalled or exceeded the 1% population threshold sufficiently often to indicate that the roost may be of greater importance than was inferred by the primary surveys. Wildfowl counts of note that were located, or probably located at Upper Dumball, include wintering flocks of up to 48 Bewick's Swans and between 90 and 120 Wigeon. There were six Bewick's Swans at this location in January 2017, but they were not present during the formal survey. This species has been recorded in previous winters in this area on fields inside the embankment, a few years ago in considerable numbers, up to 60 or 70, on rape fields that are now under maize¹¹.
- 5.26. For waders, of particular note are the GDS counts of Lapwing that have been recorded in the last five years, with flocks between 100 and 500 noted in the autumn and winter periods.
- 5.27. The GDS also contains high counts of Whimbrel, Black-tailed Godwit and Golden Plover, with the 1% threshold exceeded for all of them on one or more occasions.
- 5.28. Interest Species on the GDS for which counts did not equal or exceed the 1% SPA population threshold for Primary Roosts at Upper Dumball included White-fronted Goose (only one record of two birds), Teal, Dunlin and Knot.

¹¹ Mike Smart, personal communication

Table 5.5: Species assemblage at Roost 15401-3, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Whooper Swan				0-3	14	-	
Greylag Goose				0-1	14	-	
Canada Goose				0-100	43		
Shelduck	Y	Y		0-5	43	No	
Wigeon		Y	Y	0-5	14	No	
Dunlin	Y	Y	Y	0-14	14	No	
Curlew		Y	Y	0-35	29	No	GDS suggests Possible Primary Roost
Snipe			Y	0-2	14	Possible	GDS suggests Possible Primary Roost
Black-headed Gull				0-1000	29	-	
Common Gull				0-40	14	-	
Lesser Black-backed Gull				0-6	14	-	
Herring Gull				0-85	14	-	
Great Black-backed Gull				0-4	14	-	

- 5.29. The northern end of Upper Dumball North is continuous with the shooting area of Longney Sands controlled by the GWA, although the only wildfowlers seen there during surveys were as reported on above for Roost 2. It is probable, however, that any wildfowlers wishing to shoot from the foreshore here would disturb all roosting birds on the field south of their position(s).
- 5.30. The southern foreshore of Upper Dumball North is a no-shoot refuge area designated by the Crown Estate and GWA.
- 5.31. Areas used by birds within this roost site are sufficiently far from public rights of way for disturbance from people and dogs to be insignificant, although periodic agricultural activity will occur, with resultant disturbance. This is not considered likely to be sufficiently frequent to present a problem to the roost.

Roost 4

- 5.32. This roost covers an area of foreshore and improved grassland field at the south end of Upper Dumball. During the 2016-17 surveys it was composed entirely of gulls, with no other wetland bird species present. When the tide was low, birds were found roosting on a sand bar on the right bank. These were pushed up onto the adjacent field when the tide came in.
- 5.33. As detailed above, desk study data suggest that the south end of Upper Dumball is continuous with the north end and in fact should be considered to be the same roosting area, with species such as Curlew and Wigeon occurring anywhere within these fields.

Table 5.6: Species assemblage at roost site 15401-4, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Black-headed Gull				0-1100	43	-	
Common Gull				0-75	43		
Lesser Black-backed Gull				0-10	29	-	
Herring Gull				0-50	43	-	

- 5.34. The foreshore of Upper Dumball South is a no-shoot refuge area designated by the Crown Estate and GWA so disturbance from sporting activities does not occur here.
- 5.35. Areas used by birds within this roost site that are inland of the top of the river bank are close to a public right of way. Disturbance from people and dogs could occur. This is not considered likely to be sufficiently frequent to present a problem to the roost.

Roost 5

- 5.36. This roost is situated on a 1.5km long sand and mud flat. It is only occupied up to when the high tide covers it, usually with great rapidity as is the case with all intertidal habitats in this Sector. On neap tides, some useable high points are still available but most birds depart due to the displacement effect of the Bore.
- 5.37. The roost was most consistently composed of gull species, but on single surveys there were large numbers of Golden Plover and Lapwing, making this a Possible Primary Roost for those species. Records on the GDS suggest that this is representative of what has been seen outside of the primary survey, with Lapwing, Golden Plover and Curlew numbers on intertidal habitat in this area recorded above the 1% SPA population threshold on a number of occasions. This suggests that the site may qualify as a Possible Primary Roost for Curlew as well. 2016-17 data from John Sanders supports this.
- 5.38. There are two records of Dunlin recorded here in the last five years in numbers just below and exceeding the 1% SPA population threshold. This species was not recorded at all during the primary surveys and is thought likely to be found intermittently.
- 5.39. Ringed Plover have been seen in this general area but not at or above the 1% population threshold.

Table 5.7: Species assemblage at roost site 15401-5, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Canada Goose				0-172	14	-	
Shelduck	Y	Y		0-3	14	No	
Mallard		Y		0-1	14	No	
Little Egret				0-1	14	-	
Grey Heron				0-2	71	-	

Species	Status			Number of birds	% presence at roost site	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Golden Plover				0-99	14	Possible	
Lapwing		Y		0-319	29	Possible	
Curlew		Y	Y	0-27	29	No	GDS suggests Possible Primary
Black-headed Gull				0-1005	86	-	
Common Gull				0-314	43	-	
Lesser Black-backed Gull				0-91	86	-	
Herring Gull				0-220	86	-	
Great Black-backed Gull				0-4	57	-	

- 5.40. This is a very popular area for surfers entering the river to ride the Severn Bore. Most surfers enter at or near to The Anchor pub in Epney, at SO760110, but a few also use an access point off Overton Lane at SO737107. Many paddle downstream past Roost 5 to gain a good position for riding the Bore. Disturbance of birds caused by surfers appears to be limited in extent or at least inconsequential, given that all birds on exposed mud and sand banks are displaced by the incoming tide anyway.
- 5.41. There is a footpath along the flood bank adjacent to this roost so disturbance by walkers is possible, although it is thought unlikely that this is a popular route.
- 5.42. The intertidal habitat occupied by Roost 5 is designated as part of a larger Crown Estate shooting area controlled by GWA. No shooting activity was noted during the surveys but this would be disruptive if it took place.

Roost 6

- 5.43. This is an unimproved grassland field with a ridge-and-furrow profile. It was used by feeding Curlew and gulls during the 2016-17 surveys, with Curlew occurring in numbers above the 1% SPA population threshold for a Primary Roost on two occasions. This meant that the site could only qualify as a Possible Primary Roost. However, GDS records, which are not specific to this field but do suggest the area within which it is found, indicate that use could be frequent enough for this to be a Primary Roost for Golden Plover, Lapwing and Curlew in winter. Curlew counts by John Sanders exceeded the 1% threshold on five occasions.
- 5.44. There is clear interchange of birds between Roosts 5 and 6, with Curlew observed flying between them on both surveys when they were present.
- 5.45. GDS records suggest that Golden Plover also use the Lower Dumball area, with numbers recorded above the 1% SPA population threshold five times in the last five years.

Table 5.8: Species assemblage at roost site 15401-6, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Mallard		Y		0-4	14	No	
Curlew		Y	Y	0-79	29	Possible	GDS suggests Primary
Black-headed Gull				0-100	29	-	
Common Gull				0-22	43	-	

- 5.46. The footpath along the flood bank adjacent to Roost 5 is also in close proximity to Roost 6 but again, disturbance by walkers is not thought likely to occur frequently.

Roost 7

- 5.47. This is another unimproved grassland field with a ridge-and-furrow profile. It was used by feeding Lapwing, Curlew and gulls during the 2016-17 surveys, with both wader species occurring in numbers above the 1% SPA population threshold for a Primary Roost once each. This meant that the site could only qualify as a Possible Primary Roost. However, as for Roost 6, GDS records, which are not specific to this field but do suggest the area within which it is found, indicate that use could be frequent enough for this to be a Primary Roost for Golden Plover, Lapwing and Curlew in winter.

Table 5.9: Species assemblage at roost site 15401-7, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Lapwing		Y		0-123	14	Possible	GDS suggests Primary
Curlew		Y	Y	0-85	14	Possible	GDS suggests Primary
Black-headed Gull				0-31	14	-	
Common Gull				0-200	29	-	

- 5.48. The footpath along the flood bank adjacent to Roosts 5 and 6 is also in close proximity to Roost 7 but again, disturbance by walkers is not thought likely to occur frequently.

Roost 8

- 5.49. This roost consisted of a single-occurrence feeding flock of Curlew. This was considered likely to be part of a wide area within and adjacent to the Sector in which mobile flocks of this species would be found throughout the winter. There are no GDS records that could be attributed to this specific area.

Table 5.10: Species assemblage at roost site 15401-8, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Curlew		Y	Y	0-42	14	Possible	

- 5.50. There were no obvious indications that disturbance of this area would take place. Although the field does have rights of way around it, these are screened by trees and hedge lines.

15412 Severn – Arlingham – Uncounted Sector

General description

- 5.51. This is a long stretch of the Severn covering an area between SO732114 and SO705095, with the village of Arlingham on the left bank and Westbury-on-Severn, Broadoak and Newnham on the right bank. The WeBS Sector itself is limited to the river channel, but the surveys included fields inland of the river that were within view of the surveyors. Within this wider area, former floodplain now lies largely inland of flood banks on the left bank and land use is predominantly arable. On the right bank, the river is constrained by high ground at Garden Cliff and Newnham, with flood banks protecting the A48, which runs parallel to the river for just over a 1km.
- 5.52. On the left bank, areas between the flood bank and the river are grazed by livestock and/or cut for hay or silage. A strip of rank un-grazed grassland is found along the river's edge, ranging in width from 2 to 10m approximately. There are also two ponds between the flood bank and the river.
- 5.53. The majority of wetland bird records from this Sector that have been reported on the GDS are of gulls, with wildfowl and waders recorded in the area but not frequently. Of note, however, are large flocks of Wigeon, Teal, Ringed Plover and Golden Plover. Most of these records relate to birds seen roosting on intertidal habitat at low tide and could indicate an importance to these species that was not identified by the primary surveys in 2016-17. The area away from vantage points on the right bank may be under-recorded.

Roosting birds

- 5.54. Within this Sector, seven roosts of significant Interest Species assemblages were identified. These are listed in Table 5.11 below.

Table 5.11: Roost sites in Sector 15412 - Arlingham

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
1		SO7183812209	Mixed	Mud and sandflat on the right bank of the river	No
2		SO7129612899	Mixed	Mud and sandflat on the left bank of the river	-
3		SO7021912841	Gull	Sandflat in centre of channel	-
4	Arlingham Passage	SO6964512103	Mixed	Sandflat in centre of channel	-
5	Newnham		Wildfowl	Open water close to the right bank	No

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
6		SO6905810949	Mixed	Sand bank on the left bank of the river	No
7		SO6893510724	Wildfowl	Open water	Possible

Roost 1

- 5.55. This roost is located on a mudflat and sand bank on the right bank of the river. Low numbers of Shelduck were recorded on two of the surveys, making this a non-Primary Roost for this Interest Species. The main interest for the roost was for gulls, with birds from one or more of the three species listed below present during five out of seven surveys.

Table 5.12: Species assemblage at Roost 15412-1, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-9	29	No	
Cormorant				0-3	14	-	
Black-headed Gull				0-66	57	-	
Common Gull				0-225	29	-	
Lesser Black-backed Gull				0-16	43	-	

- 5.56. As noted for Sector 15401, this is a very popular area for surfers entering the river to ride the Severn Bore. Most surfers enter at or near to The Anchor pub in Epney, at SO760110, but a few also use an access point off Overton Lane at SO737107. Many paddle downstream past Roost 1 to gain a good position for riding the Bore. Disturbance of birds caused by surfers appears to be limited in extent or at least inconsequential, given that all birds on exposed mud and sand banks are displaced by the incoming tide anyway.
- 5.57. There is a footpath along the flood bank adjacent to this roost but it is probably sufficiently far from it that disturbance by walkers is possible unlikely.
- 5.58. Other sources of disturbance in the area that may also affect other roosts downstream include an annual paragliding weekend held each September and jet-skiing. The paragliding observed during the September survey involved multiple users flying low over the estuary in all directions from a field located at SO721115. Jet-skiing was not observed during surveys but has been seen at other times by members of the survey team. It is thought possible, from conversation with Martin McGill (see section on Sector 15402 New Grounds, Slimbridge) that users will have travelled from launch points downstream of the WWT reserve.
- 5.59. Clay pigeon shooting in a field located at SO723113 was recorded as a potential source of disturbance in December but no tangible impact on the roost was noted.

Roost 2

- 5.60. This roost is located on a mudflat and sand bank connected to the left bank of the river but with the main concentrations of birds some 350m from the bank. No Interest Species were recorded. The main interest for the roost was for gulls, with birds from one or more of the three species

listed below present during five out of seven surveys. Cormorants were present on one survey, making this a Mixed roost.

Table 5.13: Species assemblage at Roost 15412-2, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Cormorant				0-7	14	-	
Black-headed Gull				0-470	57	-	
Common Gull				0-198	57	-	
Lesser Black-backed Gull				0-400	57	-	
Herring Gull				0-10	43	-	
Great Black-backed Gull				0-4	43	-	

5.61. Other sources of disturbance in the area have been described for Roost 1 and may also affect Roost 2.

Roost 3

5.62. This is a minor gull roost on a sand bank in the centre of the river that was noted on two surveys. It is likely that the birds present would ordinarily be part of roosts upstream and downstream.

Table 5.14: Species assemblage at Roost 15412-3, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Common Gull				0-48	29	-	

Roost 4

5.63. This roost is on a sand bank in the centre of the river. It was most consistently occupied by gulls during the primary surveys in 2016-17, with cormorant and grey heron also noted. The GDS records suggest that this same area is much more important for gulls than was indicated by the primary surveys. It could also be a Primary Roost for Lapwing, with eight winter records of flocks numbering in excess of the 1% SPA population threshold (105 birds), with numbers between 350 and 750.

Table 5.15: Species assemblage at Roost 15412-4, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Cormorant				0-2	14	-	
Grey Heron				0-1	29	-	
Black-headed Gull				0-51	57	-	
Common Gull				0-10	29	-	

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Lesser Black-backed Gull				0-1	14	-	
Herring Gull				0-4	14	-	
Great Black-backed Gull				0-5	43	-	

Roost 5

- 5.64. This is a non-primary roost for Mallard, which were found roosting in widely dispersed groups on open water close to the right bank by Newnham village. Numbers did not reach the 1% SPA population threshold for a Primary Roost but birds were present on six of seven surveys.

Table 5.16: Species assemblage at Roost 15412-5, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Mallard		Y		0-22	86	No	

Roost 6

- 5.65. This is a roost on a sand bank in a bend in the river. Four species of gull were present here on the last three surveys (January to March), with a large number of Black-headed Gulls during the February survey. As Shelduck and Lapwing were present in low numbers on one of the surveys, the roost has been classified as a non-Primary roost for these Interest Species.

Table 5.17: Species assemblage at Roost 15412-6, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-1	14	No	
Lapwing		Y		0-18	14	No	
Black-headed Gull				0-1890	29	-	
Common Gull				0-350	29	-	
Lesser Black-backed Gull				0-11	14	-	
Herring Gull				0-1	14	-	

Roost 7

- 5.66. This roost was on open water and had Mallard present during three surveys, with the count exceeding the 1% SPA population threshold for a Primary Roost on one survey. The area therefore qualified as a Possible Primary Roost.

Table 5.18: Species assemblage at Roost 15412-7, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Mallard		Y		0-58	43	No	

- 5.67. The intertidal habitat within which all but one of the roosts identified in this Sector (Roost 7) is designated as part of a larger Crown Estate shooting area controlled by GWA. No shooting activity was noted during the surveys but this would be disruptive if it took place.

15403 Awre – Uncounted Sector

General description

- 5.68. This Sector covers the upstream end of a very wide area of the estuary marked on the OS map as The Noose. It extends from Awre to the shore line at Sector 15414 Frampton Realignment, which makes counting from one bank of the river to the other problematic. This is why counts in these two Sectors were co-ordinated between two surveyors.
- 5.69. The flood bank on the right bank extends to the high water mark on spring tides, with little intertidal habitat other than a thin line of saltmarsh and the extensive areas of mud and sandflats available to feeding or roosting birds. Land use adjacent to the Sector on the right bank is predominantly arable, with many fields under maize. This crop was not harvested until October. There is a small number of pasture fields, some of which appear to be unimproved.
- 5.70. The estuary contains wide areas of sand and mud banks within this Sector which are constantly eroding and accreting, with erosion evident from new channels developing through and around the Noose that differ from what is shown on the OS map. Erosion of the left bank at Saul Warth and southward to Frampton Pill is noticeable from differences on the ground to the detail given on the OS map. Upstream of Hock Ditch, on the left bank, the river passes Hock Cliff and high ground sloping down to the floodplain to the west of it. Although eroding, this bank is not changing as significantly as areas further downstream. Further detail on the shore line of the left bank and adjacent land use is described in the section below on Sector 15414.
- 5.71. The Hock Cliff area is a GWA shooting area, although no wildfowlers were noted during any of the surveys. Between Hock Cliff and Hock Ditch lies a designated refuge area. The tidal mud adjacent to Saul Warth and the fields to the south down to Frampton Pill is a private shooting area run by GWA, with access to it from the Warth and Splatt ends.

Roosting birds

- 5.72. Within this Sector, no roosts of significant Interest Species assemblages were identified. At low tide, the Noose and mudflats below Saul Warth are regularly host to large numbers of feeding Shelduck and Curlew, with notable assemblages of passage waders in spring and autumn. These birds, along with the common species of gull, do roost at low tide and on neap tides on the mud and sand flats in small numbers but over such a wide area that it is not possible to map them. It has been suggested that both species can occur in larger numbers, possibly exceeding the 1%

SPA population threshold for a Primary Roost, but this was not recorded during the surveys in 2016-17.

- 5.73. Most observations of birds on the estuary that are recorded on the GDS appear to be from the left bank (Saul Warth and southward), probably because this is more regularly watched. With reference to locations on the left bank being given on the GDS, there is some doubt as to which Sector they were in when counted. It is likely, however, that many of the larger counts of passage waders and of wildfowl that are not specific to sites within the Frampton Realignment Sector should be attributed to the Awre sector. These counts include numbers of Shelduck, Grey Plover, and Ringed Plover that have exceeded their respective 1% SPA population thresholds for Primary Roosts on a significant number of occasions.

Table 5.19: Roost sites in Sector 15403 – Awre

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
1	Mudflats off Saul Warth	SO7367507957	Wildfowl and waders	Sand bank exposed on neap tides	Possible

Roost 1 – Mudflats off Saul Warth

- 5.74. It has been noted that on a neap tide, Curlew and Shelduck stay in this area to roost because the mudbank is not covered; on a medium or high tide, they move down to Slimbridge¹². This was recorded once during the primary surveys, in March 2017. Numbers of Shelduck exceeded the 1% SPA population threshold for a Primary Roost on this occasion whilst Curlew were very close to meeting the threshold. John Sanders also recorded a flock of 36 Curlew roosting here in January 2017. Bearing in mind the previous observations of Curlew, the area was classified as a Possible Primary Roost for both species.

Table 5.20: Species assemblage at Roost 15403 -1, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-40	14	Possible	
Curlew		Y	Y	0-35	14	Possible	

- 5.75. No specific disturbance was noted for this roost during surveys, although a wildfowler has once been seen on the foreshore adjacent to it. Other disturbance issues for the wider area are dealt with in the results for Frampton Realignment below.

15414 Frampton Realignment – Uncounted Sector

General Description

- 5.76. This Sector encompasses land owned and managed by Frampton Court Estate. The majority of the fields are what appears to be unimproved or semi-improved grassland that is seasonally

¹² Mike Smart, personal communication

grazed by cattle, with free access for livestock to the actively eroding foreshore between Hock Ditch at the north end and Frampton Pill at the south (downstream) end. The mouth of the Pill and a section of the field next to it are officially within Sector 15402 but they are ecologically continuous with this Sector. The estuary beyond the foreshore is within Sector 15403 Awre.

- 5.77. Although flood banks are present along the length of the Sector, these have limited effectiveness and the fields regularly flood on the highest tides. On exceptional tidal events the whole area can be under water as far as the canal embankment but ordinarily there are two large pools of water at the south end of the Sector near to Splatt Bridge and a shallowly flooded field that persist through the winter as a result of repeated tidal events and rainfall. There is also a reedbed that has established in a clay pit that was dug many tens of years ago.
- 5.78. Saul Warth occasionally contains standing shallow water but an exceptionally high tide would be required for water to over-top from the estuary.
- 5.79. The whole Sector is given over to wildfowling leased to GWA, with shooters generally active at the southern end by Splatt Bridge and occasionally at Saul Warth. Dusk and dawn shoots are relatively frequent in the season (1st September to 31st January for inland areas, extended to 20th February for areas below mean high water).
- 5.80. A group of volunteer surveyors (including the author) from Frampton village monitors the birds on the third Thursday of each month of the year, by arrangement with the Estate and with GWA. As far as was possible, the survey for this project was carried out at the same time in order to minimise disruption to other activities and interests on the land.

Roosting birds

- 5.81. Within this Sector, six roosts of significant Interest Species assemblages were identified. These are listed in Table 5.21 below. Numbers of birds increased within this Sector from February onwards, with particularly notable increases of Curlew. This aligns very much with the findings of the volunteer surveys that have been carried out since October 2014¹³.

Table 5.21: Roost sites in Sector 15414 – Frampton Realignment

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
1	Saul Warth	SO7397708212	Mixed	Seasonally inundated grassland, flood embankment and eroding grassland river frontage.	Yes
2	The Snipe Field	SO7413407559	Wildfowl and waders	A flooded field crossed by shallow ditches. Tussocky vegetation.	Yes
3		SO7393507117	Wildfowl and waders	Unimproved grassland between eroding earth bank and the flood bank	Possible
4	Splatt Pool North	SO7405107139	Mixed	Large shallow pool	Possible
5	Splatt Pool South	SO7397906956	Mixed	Large shallow pool	Possible

¹³ Unpublished data from Gordon Kirk, survey co-ordinator

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
6	Splatt Reedbed	SO7415306921	Mixed	Reedbed with small shallow pools	Possible

Roost 1 – Saul Warth

- 5.82. This area was host to a number of wetland bird species throughout the surveys but numbers increased dramatically around the end of the shooting season in February. The Warth consistently contained Curlew, with numbers reaching or exceeding the 1% SPA population threshold on four occasions, meeting the criteria for a Primary Roost. The GDS records and the six counts by John Sanders between January and March 2017 corroborate this. Other late winter counts outside of the primary survey times suggest that the area is most important at that time¹⁴. Lapwing reached numbers in excess of the 1% SPA population threshold for this species on one occasion so the area was considered to be a Possible Primary Roost for this species.
- 5.83. The importance of Saul Warth for Dunlin could be greater than that indicated by the primary surveys, with four records on the GDS approaching or exceeding the 1% SPA population threshold for a Primary Roost. Spring and autumn passage are likely to be the periods when the greatest numbers are found.
- 5.84. The GDS lists other Interest Species as having occurred at Saul Warth, including some that were found in numbers equalling or exceeding the 1% SPA population threshold for a Primary Roost. These include Gadwall, Grey Plover, Ringed Plover, Whimbrel and Knot.

Table 5.22: Species assemblage at Roost 15414 -1, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-8	43	No	
Golden Plover				0-1	14	No	
Grey Plover		Y	Y	0-2	14	No	
Lapwing		Y		0-181	43	Possible	
Dunlin	Y	Y	Y	0-15	43	No	
Ruff				0-4	14	-	
Curlew		Y	Y	6-162	100	Yes	
Greenshank				0-1	14	-	
Redshank	Y	Y	Y	0-1	14	No	
Black-headed Gull				0-26	14	-	
Common Gull				0-1	14	-	
Lesser Black-backed Gull				0-1	14	-	

- 5.85. Disturbance from casual visitors at Saul Warth was observed during the surveys and is known to local birdwatchers to be an issue at other times. The largest flock of Curlew recorded during the surveys was flushed to the estuary by a dog off the lead, with the owner walking across the top

¹⁴ Personal observations by various local birdwatchers reported to the author

field apparently oblivious to the birds. No wildfowlers were present during surveys (by arrangement with GWA).

Roost 2 – The Snipe Field

- 5.86. This field is landward of the flood bank just south of Saul Warth. It is known to the volunteer bird surveyors as The Snipe Field and to wildfowlers as The Wigeon Pool. It was probably managed to encourage wildfowl in the past, with shallow channels cut across it to encourage retention and distribution of water. The vegetation here was dominated by sea club-rush (*Bolboschoenus maritimus*).
- 5.87. The field contained numbers of Snipe that exceeded the 1% SPA population threshold for a Primary Roost on six of the seven surveys. Jack Snipe were also present in good numbers, with counts of between one and 9 birds over four of the surveys.

Table 5.23: Species assemblage at Roost 15414-2, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-2	14	No	
Mallard		Y		0-4	14	No	
Oystercatcher				0-2	14	-	
Lapwing		Y		0-75	29	No	
Jack Snipe				0-9	71	-	
Snipe			Y	0-90	86	Yes	
Curlew		Y	Y	0-2	14	No	
Green Sandpiper				0-2	14	-	

- 5.88. There are no likely sources of disturbance to this roost other than wildfowling, but this has not been a productive area for shooting for some time and is generally avoided.

Roost 3

- 5.89. This is a section of the river frontage outside of the flood bank that shows the maximum extent of a roosting area observed during primary surveys. It is likely that roosting flocks occur elsewhere along here at other times as the habitat is homogenous between Frampton Pill and the south end of Saul Warth. The habitat here is unimproved grassland between the eroding earth bank at the river frontage and the flood bank.
- 5.90. Numbers of Curlew were above the 1% SPA population threshold for a Primary Roost on one survey, making this a Possible Primary Roost.

Table 5.24: Species assemblage at Roost 15414-3, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-8	14	No	
Little Egret				0-3	14	-	
Dunlin	Y	Y	Y	0-120	14	-	
Curlew		Y	Y	0-186	29	Possible	

- 5.91. There are no frequent sources of disturbance to this roost but walkers with dogs have been seen trespassing along the river bank on a number of occasions¹⁵ outside of the primary survey times. Wildfowling takes place close to the south end of this roost but it is not occupied during the shooting season.

Roost 4 – Splatt Pool North

- 5.92. This is a large shallow pool with frequent tussocks of emergent vegetation and grass clumps left by cattle poaching, as well as increasing areas of exposed mud as the water levels drop into the spring. By early summer this feature is usually dry, only to re-fill if tides are very high and water flows in through breaches in the flood bank, or if rainfall is very high.
- 5.93. Shelduck and Dunlin numbers reached the 1% SPA population threshold for a Primary Roost on one occasion each so the site was considered to be a Possible Primary Roost for these species. The GDS records suggest that the area is a Primary Roost for Shelduck but probably only in the spring and autumn periods, with birds avoiding it during the wildfowling season.
- 5.94. The importance of this area for Lapwing could be greater than that indicated by the primary surveys, with three records on the GDS approaching or exceeding the 1% SPA population threshold for a Primary Roost. Late winter and during spring and autumn passage are likely to be the periods when the greatest numbers are found. Observations made in February 2017 outside of the formal survey times illustrate this, with counts of between 138 and 2100¹⁶ in that month alone.
- 5.95. Similarly, the importance of this area for Curlew could be greater than that indicated by the primary surveys, with a large number of records on the GDS approaching or exceeding the 1% SPA population threshold for a Primary Roost. Late winter is the period when the greatest numbers are found as birds gather to leave for breeding grounds.
- 5.96. The GDS lists other Interest Species as having occurred in this area, including some that were found in numbers equalling or exceeding the 1% SPA population threshold for a Primary Roost. These include Pintail, Shoveler and Black-tailed Godwit.

¹⁵ The author's personal observations, as well as those of other local bird watchers.

¹⁶ Personal observation by the author

Table 5.25: Species assemblage at Roost 15414-4, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Mute Swan				0-2	43	-	
Greylag Goose				0-1	14	-	
Canada Goose				0-4	14	-	
Shelduck	Y	Y		0-36	57	Possible	GDS suggests Primary Roost
Little Egret				0-3	57	-	
Great White Egret				0-1	14	-	
Lapwing		Y		0-70	57	No	GDS suggests Primary Roost
Dunlin	Y	Y	Y	0-350	29	Possible	
Curlew		Y	Y	0-5	43	No	GDS suggests Primary Roost
Green Sandpiper				0-1	29	-	
Redshank	Y	Y	Y	0-21	57	No	
Black-headed Gull				0-70	57	-	
Herring Gull				0-2	14	-	

- 5.97. The most obvious source of disturbance to this roost is wildfowling. Shooters take up positions along the hedge line between this roost and Roost 5 (see below), with decoys laid out within range of the guns. Dusk and dawn are the favoured periods in which shooting takes place in the season (as is usually the case), particularly if this coincides with a high tide. Bird numbers increased markedly after the end of the shooting season.

Roost 5 – Splatt Pool South

- 5.98. This is a similar feature to Roost 4 but it does not contain the tussock vegetation that is found in the former roost. Instead, this is an open shallow water area that becomes a pan of baked dry mud in the late spring. It is surrounded by grassland and has a hedge line to the north side and a reedbed lined by discontinuous scrub (Roost 6 – see below) to the east side. As a result, roosting and feeding wetland birds tend to be found on the west side, in the main water body and on the shoreline to the east that is furthest from the scrub.
- 5.99. Roost 5 was not well populated during the surveys but Gadwall and Snipe reached the 1% SPA population threshold for a Primary Roost on one occasion each so the site was considered to be a Possible Primary Roost for these species.

Table 5.26: Species assemblage at Roost 15414-5, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Gadwall	Y	Y		0-2	14	Possible	
Teal		Y		0-23	14	No	GDS suggests Possible Primary Roost
Little Egret		Y		0-2	14	-	
Snipe			Y	0-2	29	Possible	
Curlew		Y	Y	0-7	14	No	

5.100. Sources of disturbance of this roost are the same as those for Roost 4.

Roost 6 – Splatt Reedbed

5.101. Roost 6 is an area of reedbed fringed with scrub and shallow pools and ditches. Work to improve this for wildlife was started in September 2016 and included scrape creation, scrub reduction and fencing.

5.102. Snipe reached the 1% SPA population threshold for a Primary Roost on two surveys so the roost was determined to be a Possible Primary Roost for this species. The GDS corroborates this, with nine reports of counts at or above the 1% SPA population threshold.

5.103. Although Teal were not found in numbers near to the 1% SPA population threshold during the primary surveys in 2016-17, they have been recorded in large numbers in this area in the past five years, predominantly in the late winter and early spring. The GDS contains records of between 80 and 300, all but one of which refer to the reedbed. This number of birds must have been found in a wider area than just the reedbed but that was the reference site quoted.

Table 5.27: Species assemblage at Roost 15414-6, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Teal		Y		0-22	14	No	
Little Egret				0-1	14	-	
Water Rail				0-1	43	-	
Moorhen				0-2	29	-	
Coot				0-1	14	-	
Snipe			Y	0-5	57	Possible	
Green Sandpiper				0-2	29	-	
Greenshank				0-1	14	-	
Redshank	Y	Y	Y	0-1	14	No	

5.104. Roost 6 is shielded from some of the disturbance effects of wildfowling by tall vegetation but the passage of shooters going to set up on the pools adjacent to it must cause some limited disturbance at times. The Snipe are unlikely to flush unless closely approached, as is the experience of the volunteer survey group.

-
- 5.105. Fencing works were being carried out by a contractor during the October survey. It was thought likely that the disturbance caused was a main reason for a lack of birds in the vicinity, but clearly this is not a regular occurrence.
- 5.106. Surfers accessing (trespassing) the river via Hock Ditch, at the north end of the Frampton Realignment do so 1-1.5 hours before high tide, paddling downstream to Frampton Breakwater, thereby displacing feeding birds on the estuary within the Awre section and adjacent to Frampton Realignment. This could happen several times a month, depending on the height of the bore.

15402 New Grounds, Slimbridge – Counted Sector

General description

- 5.107. This Sector covers the WWT Slimbridge reserve and the estuary across to the shore line at Awre, taking in parts of Frampton Sands and The Noose, another sand bank. It is regularly counted (from the reserve) by Martin McGill, Senior Reserve Warden at WWT. Although a counted Sector, parts of it were covered by primary surveys in 2016-17. The areas covered included the shoreline just upstream of Brims Pill to Whitescourt/ Awre village on the right bank of the river, an area of the Royal Drift at the south west end, and sand and mud flats at the north end of the Sector on the left bank. The Royal Drift is a “blind spot” for Martin when counting from the reserve and was covered by the surveyor at Purton when surveying Sector 15411. The north end of Sector 15402 was visible from the 15414 Frampton Realignment Sector and this was covered from it to add additional detail.
- 5.108. The right bank habitat inland of the flood bank was composed of pasture and arable farmland, with some unimproved grassland fields with ridge-and-furrow profiles suggesting that they have never been deep-ploughed. The intertidal habitats on this bank were restricted to a narrow and discontinuous band of saltmarsh at the toe of the flood bank.
- 5.109. The estuary at low tide is composed of large areas of mud and sand flats, as well as a large area of accreting saltmarsh on the left bank. This has been shifting in extent over the last few years, with an “island” of this habitat having been established just off shore from the WWT reserve. This is now eroding again on the downstream side due to the influence of rapidly incoming tidal flows that are now directed at it by sand and mud banks that are building up just downstream. Upstream of the island, saltmarsh is beginning to establish on accreting mud and sand banks, forming a shore line that is not shown on the published OS maps¹⁷. This makes mapping of roosts problematic using OS base maps and the locations shown are therefore approximate.
- 5.110. The WWT site inland of the high water mark is composed of a range of wetland habitats, from wet grassland, shallow and deep freshwater pools and reedbeds, as well as improved pasture and an arable field that are managed to provide fodder for wintering wildfowl. The site is divided up into seven main sub-Sectors which themselves are divided into individual land parcels. The sub-Sectors within which WeBS counts are made are shown in green and the land parcels within each are shown in blue in Figure 5.1 below. These are referred to in the detailed descriptions of roosting birds that follow.

¹⁷ Martin McGill, personal communication. This can be seen on publicly available aerial photographs such as GoogleEarth™.

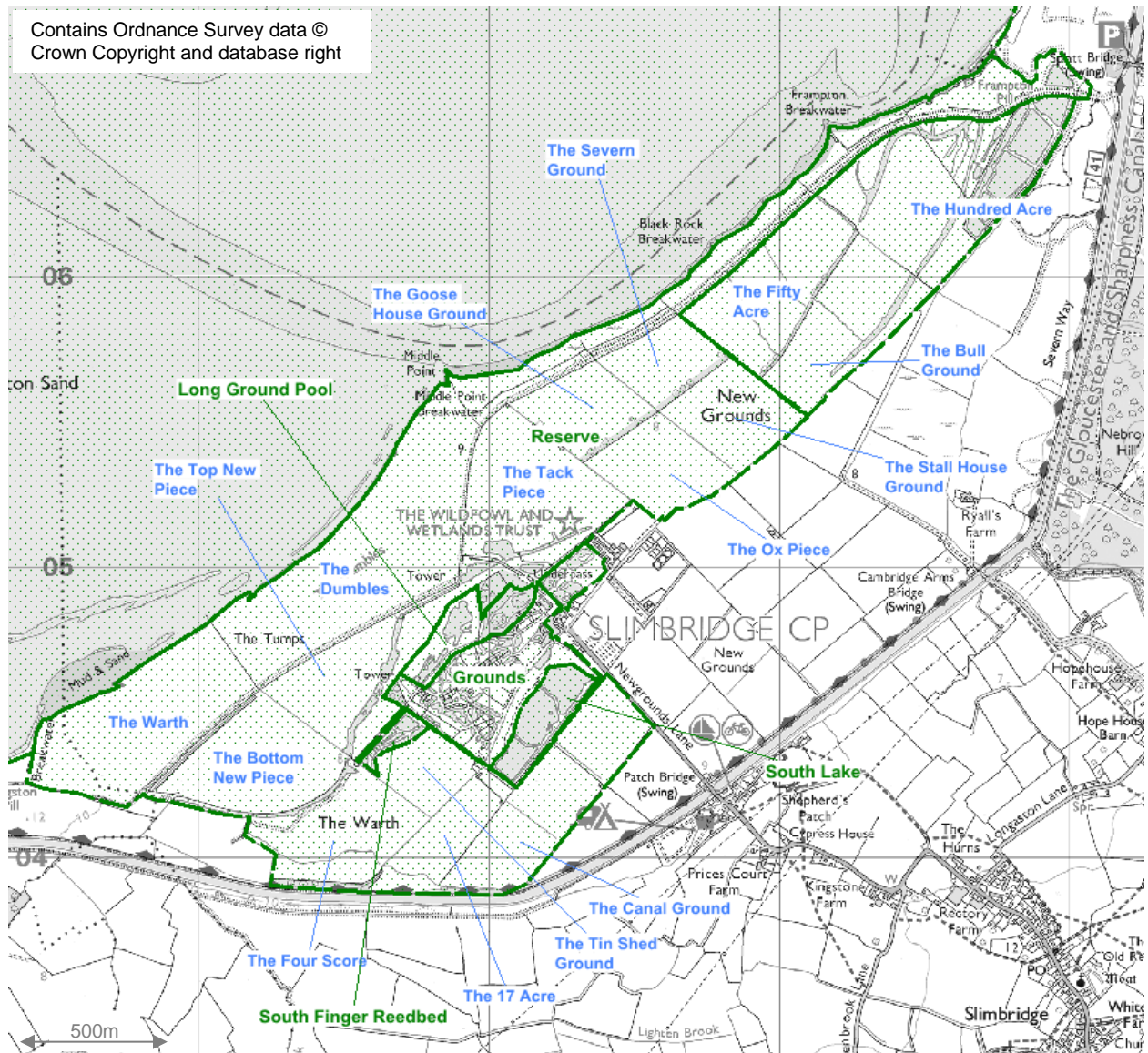


Figure 5.1 – WeBS counting sub-Sectors at WWT Slimbridge (shown in green) and land parcels within them (shown in blue)

Roosting birds recorded during primary surveys in 2016-17

- 5.111. Within this Sector, six roosts of significant Interest Species assemblages were identified by primary survey in 2016-17. Two were on the right bank, two on estuary sandflats and two were on the left bank of the river. The sixth roost, at the downstream end of the Sector, is continuous with an area within Sector 15411 Purton to Brims Pill, and this is described in that section of this report. These are listed in Table 5.28 below.

Table 5.28: Roost sites in Sector 15402 – New Grounds, Slimbridge, outside of the WWT reserve

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
1	Whitescourt	SO7146307842	Wader	Unimproved grassland field, ridge and furrow.	Possible
2	Hall Farm	SO7038607467	Waders and gulls	Arable and sheep-grazed fields.	Possible
3	The Noose	SO7289806875	Wildfowl	Edge of a pool on sandflats at low tide.	Possible
4	Off Frampton Breakwater	SO7327006685	Wildfowl and waders	Edge of sandflat	Possible
5	Mouth of Frampton Pill	SO7375606800	Waders	Slumping vegetated earth bank	No

Roost 1 - Whitescourt

- 5.112. This roost was recorded on only two surveys, in December and February. Lapwing were present in low numbers on both dates and a single Golden Plover was noted in December. The greatest interest for waders was, however, a count of 220 Curlew on the same date. All birds were feeding in an unimproved ridge-and-furrow grassland field. The flock exceeded the 1% SPA population threshold for a Primary Roost but did not occur frequently enough to qualify. It was therefore classified as a Possible Primary Roost.
- 5.113. The GDS shows that this Curlew roost/ feeding area has been recorded 15 times in the last 5 years, with numbers exceeding the 1% SPA population threshold for a Primary Roost on 13 of these counts. One record is of 70 birds being flushed off intertidal areas by the high tide and flying to Slimbridge but four others indicate prolonged occupancy at high tide, whilst the remainder do not specify. In addition to this, a farmer who spoke to the surveyor on the September 2016 primary survey mentioned that he had seen 200 Curlew at this roost a few days previously. These records suggest that the field is in fact a Primary Roost.
- 5.114. Lapwing have also occurred in numbers exceeding the 1% SPA population threshold for a Primary Roost on four out of five counts reported. This suggests that the area may also be a Primary Roost for this species.
- 5.115. Whimbrel have been recorded at Whitescourt twice, with a count of 10 in May 2012 exceeding the 1% SPA population threshold. The lack of other records at what appears to be a reasonably well-watched site suggests that this is not a Primary Roost (passage) for Whimbrel.
- 5.116. Other Interest species recorded on the GDS with the same location as a reference but that did not reach or exceed the 1% SPA population threshold for a Primary Roost include Dunlin, Golden Plover and Snipe.

Table 5.29: Species assemblage at Roost 15402-1, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Golden Plover				0-1	14	No	
Lapwing		Y		0-3	29	No	
Curlew		Y	Y	0-35	29	Possible	GDS suggests Possible or Primary Roost

- 5.117. Sources of disturbance of this roost were not apparent other than that there is a footpath along the flood bank. This did not appear to be well used.

Roost 2 – Hall Farm

- 5.118. This roost covered a disparate area of arable and sheep-grazed fields between Hall Farm and Whitescourt. It contained feeding Lapwing and Curlew that interchanged between this area and that covered by Roost 1. Numbers of Lapwing exceeded the 1% population threshold on the one survey when they occurred, whereas Curlew exceeded the threshold on two surveys (40 and 109 birds respectively). These observations suggested that the area may qualify as a Primary Roost, although there is only one GDS record of 65 Curlew in this area to indicate that it is used with any regularity.
- 5.119. Black-headed and herring gulls were also present during the 2016-17 surveys but in low numbers.

Table 5.30: Species assemblage at Roost 15402-2, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Lapwing		Y		0-121	14	Possible	
Curlew		Y	Y	0-109	71	Possible	
Black-headed Gull				0-70	43	-	
Herring Gull				0-1	14	-	

- 5.120. There were no obvious sources of disturbance to this roost other than from normal agricultural operations.

Roost 3 – The Noose

- 5.121. This roost was only noted on one survey but contained Wigeon in excess of the 1% SPA population threshold for a Primary Roost. It was therefore classified as a Possible Primary Roost. The flock of 164 birds, along with one Shelduck, was located on the edge of a pool that had formed on a sandflat at low tide. During the interviews with Martin McGill (see below), mention was made of how wildfowl will fly to such features in the estuary to escape disturbance on the WWT reserve (and probably from elsewhere), so it is possible that this roost is a regular occurrence up to the time when the incoming tide covers the sand.

Table 5.31: Species assemblage at Roost 15402-3, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-1	14	No	
Wigeon		Y	Y	0-164	14	Possible	

Roost 4 – off Frampton Breakwater

- 5.122. This roost was also located on sandflats, on a bend in the low water channel nearer to Frampton Breakwater than Roost 3. Wigeon and Curlew were noted using it in numbers in excess of the 1% SPA population threshold for the former species and just below it for the latter, but only on one occasion each.

Table 5.32: Species assemblage at Roost 15402-4, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Wigeon		Y	Y	0-125	14	Possible	
Curlew		Y	Y	0-31	14	No	

- 5.123. Sources of disturbance to birds roosting on the intertidal mud and sand in this area are outlined in the next section of this report on birds at WWT Slimbridge.

Roost 5 – mouth of Frampton Pill

- 5.124. This roost was composed of a slumping vegetated earth bank at the mouth of Frampton Pill. Whilst Curlew were seen in low numbers on two surveys, Martin McGill has stated that up to 70 birds have been seen whilst carrying out his WeBS survey from the Hundred Acre flood bank and that birds avoid it during the wildfowling season. In addition, low numbers of Whimbrel, Knot and Bar-tailed Godwit have been seen at this location. This suggests that the roost could be a Primary Roost during spring and autumn passage.

Table 5.33: Species assemblage at Roost 15402-5, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Curlew		Y	Y	0-5	29	No	Possible Primary (passage)

- 5.125. GDS records for the species noted in 2016-17 for the area around Frampton Breakwater and the mouth of the Pill, the Noose and the Royal Drift suggest that these areas could be a Primary Roosts for a number of Interest Species prior to coverage at high tide, although the size of the areas counted, the behaviour of birds and the state of the tide was not specified, so cannot be relied upon to be illustrative of roosting.

Roosting birds recorded during WeBS counts from WWT Slimbridge

- 5.126. The majority of roosts identified elsewhere within the Sector were at WWT Slimbridge or on the estuary immediately north of it. These were identified by Martin McGill during the WeBS counter interview.
- 5.127. The interviews were carried out on 15th January and 22nd May 2017 and the site visit was on 15th January 2017. Maximum and minimum numbers of birds seen on each section of the reserve were derived from the data provided by WWT. The “% of counts above the 1% threshold” was derived using the formulae given in the Methods section of this report and from this the initial assessment of whether or not the SPA Primary Roost criteria were met was derived. As all counts were standard Core Counts, all birds counted were considered, for the purposes of the assessment, to be “roosting” in the broad sense outlined in Section 3.0 above.
- 5.128. Martin McGill was at pains to emphasise the fact that use of the reserve by the Interest Species was very much dependent on the state of the tide, daylight hours, whether or not flooding had occurred in key areas and the effect of disturbance events. WeBS counts have always, therefore, been very much a snapshot of where birds were and the criteria for Primary Roost selection that have been applied elsewhere do not work well with a site known to be as dynamic as WWT Slimbridge. It has therefore been necessary to juxtapose the apparent importance of the counting sub-Sectors, as determined by the Primary Roost criteria, with the periodic but vital importance of each land parcel within them as described by Martin in order to determine the true value of roosts at WWT to the SPA populations of the Interest Species. Whereas the count data may suggest an importance for individual land parcels that is lower than that of Primary Roost, in many cases such areas were considered by Martin to be of high importance to the species using them, either cyclically through the year or through a season. Where this is the case, an explanation as to why the classification of the roost deviates from the analysis of the counts is given.

The overall importance of New Grounds, Slimbridge (WWT) at high tide

- 5.129. The overall importance of the Sector was determined using the pooled data. This showed that the Sector contains numbers of birds at high tide that exceed the 1% SPA population threshold for Bewick's Swan, European White-fronted Goose, Shelduck, Wigeon, Gadwall, Teal, Mallard, Pintail, Shoveler, Pochard, Tufted Duck, Lapwing, Snipe, Black-tailed Godwit, Curlew and Spotted Redshank. This is shown in Table 5.34 below.

Table 5.34: Importance of high tide bird numbers in Sector 15402 as a whole - SPA and SSSI species, with Black-tailed Godwit and Golden Plover, based on data supplied by WWT

Note that only SPA Qualifying and Assemblage species, SSSI and 1993 SPA citation species plus additional interest species Black-tailed Godwit and Golden Plover are shown here. For a complete list of species present in each sub-section of the Sector, see Appendix 4.

Notes on terms used in table headings

Range of counts – the lowest and highest number of birds counted during the period January 2011 to February 2017.

% of counts above 1% threshold – the percentage of counts during the period January 2011 to February 2017 where 1% or more of the SPA population (based on the most recent five year Mean peak counts for the Severn Estuary SPA, covering 2010/11 to 2014/15) was met or exceeded.

SPA Primary Roost? – If the percentage of counts in the column to the left was 50% or more, the criteria for the site being an SPA Primary Roost would be met, hence a “Y” for “yes” and an “N” for “no”.

Species	Species listing				Range of counts		% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To		
Bewick's Swan	Y	Y			1	306	76	Y
European White-fronted Goose	Y	Y			2	560	84	Y
Shelduck	Y	Y			63	596	100	Y
Wigeon		Y	Y		1	5,204	55	Y
Gadwall	Y	Y			15	129	100	Y
Teal		Y			1	3,820	79	Y
Mallard		Y			80	1,315	100	Y
Pintail		Y			1	955	66	Y
Shoveler		Y			7	332	100	Y
Pochard		Y			1	725	56	Y
Tufted Duck		Y			52	705	100	Y
Ringed Plover			Y	Y	1	365	25	N
Golden Plover					1	4387	43	N
Grey Plover		Y	Y		1	34	22	N
Lapwing		Y			21	7400	73	Y
Knot			Y		1	30	3	N
Dunlin	Y	Y	Y		3	2560	37	N
Snipe			Y		1	80	75	Y
Black-tailed Godwit					1	535	96	Y
Whimbrel		Y	Y		1	11	9	N
Curlew		Y	Y		1	490	77	Y
Spotted Redshank				Y	1	3	51	Y
Redshank	Y	Y	Y		1	111	30	N
Turnstone			Y		1	6	3	N

Roosts identified at WWT Slimbridge

- 5.130. 18 separate roosting sub-sections were identified within WWT Slimbridge and the area immediately adjacent to it. These are listed in Table 5.35 below. Tables showing the results of the Primary Roost criteria calculations for the counting sub-Sectors are given in full in Appendix 4. These are used to characterise the roosts in an additional exercise to the counter interview. Tables showing the results of the calculations for the Interest Species are presented in Tables 5.36 to 43 below.

Table 5.35: Roost sites recorded during WeBS counts from WWT Slimbridge in Sector 15402

Roost no.	Roost Site Name	Grid reference (site centroid)	Roost Type	Description	SPA Primary Roost?
6	100 Acre Pools	SO7382306372	Wildfowl	A series of deep pools fringed by reedbeds and other marginal vegetation.	Y
7	100/50 Acre/ Bull Ground	SO7347006270	Mixed	Wet grassland with shallow pools and channels. Seasonally wet in late winter.	Y
8	South bank of Frampton Pill	SO7371806682	Wader	Un-grazed grassland with reedbed	Y
9	Black Rock Breakwater	SO7277306109	Wader	Rock-armoured breakwater with flood bank behind	Possible
10	Middle Point	SO7191605629	Wader	Un-grazed grassland with reedbed	Y
11	The Dumbles	SO7168405110	Mixed	Grazed Atlantic Pasture	Y
12	The Warth	SO7079504493	Mixed	Grazed Atlantic Pasture	N
13	Goose House, Severn and Stall House Grounds + Ox Piece	SO7261405532	Wildfowl and waders	Pasture and arable fields managed for wildfowl grazing	Y
14	The Tack Piece	SO7210305251	Mixed	Permanent pasture with large pool and pond	Y
15	Top New Piece	SO7154404614	Mixed	A large pool, exposed mud, reedbeds and wet pasture.	Y
16	Bottom New Piece	SO7121104341	Wildfowl and waders	Pasture managed for grazing wildfowl with a scrape	Y
17	Canalside fields	SO7227904253	Wildfowl and waders	Pasture	N
18	Fields N. of Newgrounds Lane	SO7306505015	Wildfowl	Pasture	N
19	Rushy Pen	SO7231305007	Mixed	Variable depth open water with relatively bare islands and some rough grassland.	Y
20	South Lake	SO7218904467	Mixed	Two pools, a shallow one with exposed mud and a deeper one to the north.	Y
21	Grounds	SO7202904645	Wildfowl	Pools with wildfowl collection and other captive animals.	N
22	Long Ground Pool	SO7181604680	Wildfowl	Reed-fringed linear pools and a duck decoy pond.	Y
23	Accreting Saltmarsh	SO7102404933	Mixed	Large area of accreting saltmarsh	Y
24	Frampton Sand	SO7108305555	Wildfowl	Sandflats	Y

Tables 5.36 to 43: Interest Species composition of sub-sections of Sector 15402, based on data supplied by WWT

Note that only SPA Qualifying and Assemblage species, SSSI and 1993 SPA citation species plus additional interest species Black-tailed Godwit and Golden Plover are shown here. For a complete list of species present in each sub-section of the Sector, see Appendix 4.

The 100/50 Acre, the Reserve and the River contain more than one roost. Data presented below are for all roosts combined in these sub-Sectors.

Notes on terms used in table headings

Range of counts – the lowest and highest number of birds counted during the period January 2011 to February 2017.

% of counts above 1% threshold – the percentage of counts during the period January 2011 to February 2017 where 1% or more of the SPA population (based on the most recent five year Mean peak counts for the Severn Estuary SPA, covering 2010/11 to 2014/15) was met or exceeded.

SPA Primary Roost? – If the percentage of counts in the column to the left was 50% or more, the criteria for the site being an SPA Primary Roost would be met, hence a “Y” for “yes” and an “N” for “no”.

Table 5.36: Species assemblage on the 100/50 Acre

Species	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Bewick's Swan	Y	Y			2	24	0	3	N
European White-fronted Goose	Y	Y			2	2	0	0	N
Shelduck	Y	Y			2	65	0	3	N
Wigeon		Y	Y		1	880	2	20	N
Gadwall	Y	Y			2	108	0	91	Y
Teal		Y			1	1,600	299	46	N
Mallard		Y			2	90	4	10	N
Pintail		Y			1	70	0	15	N
Shoveler		Y			1	203	42	87	Y
Pochard		Y			1	23	0	10	N
Tufted Duck		Y			2	97	16	83	Y
Golden Plover					6	6	0	0	N
Lapwing		Y			2	3000	0	1	N
Dunlin	Y	Y	Y		6	185	0	0	N
Snipe			Y		1	51	1	27	N
Black-tailed Godwit					1	15	0	0	N
Curlew		Y	Y		2	320	0	11	N
Redshank	Y	Y	Y		2	30	0	0	N

Table 5.37: Species assemblage in the Grounds

Species	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Bewick's Swan	Y	Y			1	306	5	32	N
Shelduck	Y	Y			1	266	40	47	N
Wigeon		Y	Y		2	34	0	0	N
Gadwall	Y	Y			1	55	2	0	N
Teal		Y			2	200	0	7	N
Mallard		Y			106	916	423	97	Y
Pintail		Y			2	332	0	15	N
Shoveler		Y			1	10	0	6	N
Pochard		Y			1	544	0	16	N
Tufted Duck		Y			8	514	134	96	Y
Lapwing		Y			2	240	2	3	N
Black-tailed Godwit					16	227	0	6	N
Redshank	Y	Y	Y		78	78	0	1	N

Table 5.38: Species assemblage at the Long Ground Pool

Species	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Shelduck	Y	Y			1	56	4	9	N
Wigeon		Y	Y		2	86	0	1	N
Gadwall	Y	Y			2	38	10	54	Y
Teal		Y			2	76	0	1	N
Mallard		Y			9	354	61	37	N
Pintail		Y			1	44	12	12	N
Shoveler		Y			1	23	1	10	N
Pochard		Y			1	20	20	4	N
Tufted Duck		Y			3	77	15	57	Y
Snipe			Y		1	1	0	0	N

Table 5.39: Species assemblage on the Reserve

Species	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Bewick's Swan	Y	Y			2	270	147	47	N
European White-fronted Goose	Y	Y			3	560	142	79	Y
Shelduck	Y	Y			1	171	12	47	N
Wigeon		Y	Y		1	5,000	1,142	49	N
Gadwall	Y	Y			1	84	4	83	Y
Teal		Y			1	3,015	1,005	70	Y
Mallard		Y			2	191	30	59	Y
Pintail		Y			2	265	146	25	N
Shoveler		Y			1	113	16	79	Y
Pochard		Y			1	33	12	10	N
Tufted Duck		Y			2	110	13	56	Y
Ringed Plover			Y	Y	1	8	0	0	N
Golden Plover					1	4387	1	35	N
Grey Plover		Y	Y		1	34	0	3	N
Lapwing		Y			3	4400	758	57	Y
Knot			Y		1	19	0	0	N
Dunlin	Y	Y	Y		1	2000	483	34	N
Snipe			Y		1	53	2	47	N
Black-tailed Godwit					1	437	1	47	N
Whimbrel		Y	Y		1	1	0	0	N
Curlew		Y	Y		2	199	15	19	N
Spotted Redshank				Y	1	3	0	43	N
Redshank	Y	Y	Y		1	45	0	3	N

Table 5.40: Species assemblage on the River

Species	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Bewick's Swan	Y	Y			4	5	0	5	N
European White-fronted Goose	Y	Y			28	28		3	N
Shelduck	Y	Y			8	355	31	71	Y
Wigeon		Y	Y		1	2,851	1,131	44	N
Gadwall	Y	Y			1	5	0	6	N
Teal		Y			3	518	0	10	N
Mallard		Y			2	38		1	N
Pintail		Y			2	800		31	N
Shoveler		Y			6	174	0	9	N
Ringed Plover			Y	Y	1	364	0	25	N
Golden Plover					1	1800	0	6	N
Grey Plover		Y	Y		1	20	0	19	N
Lapwing		Y			4	3782	0	3	N
Knot			Y		1	30		3	N
Dunlin	Y	Y	Y		1	2200	0	6	N
Black-tailed Godwit					1	73	0	3	N
Whimbrel		Y	Y		1	11		9	N
Curlew		Y	Y		1	490	2	57	Y
Redshank	Y	Y	Y		1	40	1	1	N
Turnstone			Y		1	6	0	3	N

Table 5.41: Species assemblage on the Rushy Pen

Species	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Bewick's Swan	Y	Y			4	145	0	21	N
Shelduck	Y	Y			2	162	110	31	N
Wigeon		Y	Y		1	8	0	0	N
Gadwall	Y	Y			1	15	0	46	N
Teal		Y			2	433	121	20	N
Mallard		Y			8	415	283	47	N
Pintail		Y			2	211	121	42	N
Shoveler		Y			1	8	1	6	N
Pochard		Y			2	301	99	30	N
Tufted Duck		Y			2	337	226	57	Y
Lapwing		Y			1	420	82	3	N
Snipe			Y		2	5		6	N
Black-tailed Godwit					1	49	0	4	N
Redshank	Y	Y	Y		1	10	1	0	N

Table 5.42: Species assemblage on the South Finger Reedbed

Species	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Shelduck	Y	Y			1	25	0	0	N
Wigeon		Y	Y		3	22	0	0	N
Gadwall	Y	Y			1	16		13	N
Teal		Y			2	42	0	0	N
Mallard		Y			2	30	20	3	N
Shoveler		Y			1	34	0	4	N
Pochard		Y			2	2	0	0	N
Tufted Duck		Y			1	35	9	40	N
Lapwing		Y			1	1	0	0	N
Snipe			Y		2	2	0	1	N

Table 5.43: Species assemblage on the South Lake

Species	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Shelduck	Y	Y			1	81	9	10	N
Wigeon		Y	Y		1	5	4	0	N
Gadwall	Y	Y			1	86	6	94	Y
Teal		Y			2	243	211	49	N
Mallard		Y			10	298	75	76	Y
Pintail		Y			1	6	0	3	N
Shoveler		Y			2	198	15	81	Y
Pochard		Y			1	157	30	36	N
Tufted Duck		Y			1	458	44	90	Y
Golden Plover					800	800	0	2	N
Lapwing		Y			2	2900	1550	33	N
Knot			Y		1	3	3	0	N
Dunlin	Y	Y	Y		1	800	196	3	N
Snipe			Y		1	25	0	14	N
Black-tailed Godwit					1	304	111	60	Y
Curlew		Y	Y		143	143	0	1	N
Spotted Redshank				Y	1	2	0	6	N
Redshank	Y	Y	Y		1	111	1	13	N

The Hundred/ Fifty Acre

5.131. This sub-Sector covers the Hundred Acre, Fifty Acre and Bull Ground (see Map 5.1 above) and is composed of pools in the north east corner and a wider area of wet grassland with channels and seasonal shallow pools. Table 5.36 above shows the list of species recorded on the WWT database and how often (if at all) 1% of the SPA populations for all Interest Species was met or exceeded during 50% or more of the WeBS surveys carried out in that time over the whole sub-Sector. This was the case for three species, namely Gadwall, Shoveler and Tufted Duck. Given that there are two distinct parts to the sub-Sector, these have been examined individually as follows:

Roost 6 – Hundred Acre Pools

5.132. These pools were dug to source material for the flood bank that lies to the north and west sides. They are reed-fringed, with willow and other vegetation scattered along the shore line and on islands.

5.133. The pools were considered to be a Primary Roost for Gadwall, Shoveler and Tufted Duck. The calculations for the 100/50 Acre sub-Sector corroborate this.

Roost 7 – the Hundred Acre, Fifty Acre and the Bull Ground

5.134. These land parcels are composed predominantly of low lying grassland with channels dug through them to distribute floodwater into shallow inter-connected pools and scrapes. When flooded, the area attracts large numbers of wildfowl, predominantly in late winter (February onwards), giving the area a short-term but vital importance to the overwintering birds at WWT

Slimbridge. Floodwaters accumulate most regularly in an area at the north end of the Hundred Acre adjacent to Roost 6. Species present are Bewick's Swan, White-fronted Goose, and large numbers of Wigeon, Teal, Shoveler and Tufted Duck. Counts of 5-6000 Teal are not unusual between November and April or May. Shoveler move from Roost 6 to Roost 7 when flooding occurs. Pintail are also present once flooding has occurred but not in large numbers.

- 5.135. The short-term but vital importance of the area is the reason why it has been considered to be a Primary Roost for a larger number of wildfowl species than that which was identified by the analysis of the WeBS figures. These species are Bewick's Swan, Wigeon, Teal, Shoveler and Tufted Duck.
- 5.136. The area has also been known to be visited by significant numbers of waders, principally Curlew and Lapwing. Numbers of Curlew were above the 1% SPA population level between September and December 2013 but have not been at this level since. Lapwing numbers exceeded the threshold only once. Snipe have not reached very large numbers during WeBS counts but Martin McGill has stated that up to 130 can be flushed from the Fifty Acre and 150 from the Hundred Acre during management operations such as mowing. For this reason, the area is considered a Primary Roost for Snipe.

The Reserve

- 5.137. The area covered by the Reserve sub-Sector is very large (nearly 2.5km²) and encompasses a diverse range of habitats including Atlantic Salt pasture, "special Goose pasture", permanent pasture, one arable field and open water (shallow scrapes and deeper channels)¹⁸. As a whole, and on the basis of the WeBS data alone, it has been found to fit the Primary Roost criteria for European White-fronted Goose, Gadwall, Teal, Mallard, Shoveler, Tufted Duck and Lapwing. Bewick's Swan, Shelduck, Wigeon, Snipe, Black-tailed Godwit and Spotted Redshank have been so close to meeting the criteria that the Reserve should be considered to be a Primary Roost for these species as well. To better describe the area, it has been divided into a number of roosts, as follows:

River frontage between Frampton Pill and Middle Point

- 5.138. This area of land between the flood bank and the estuary is described as Atlantic Salt Pasture and is composed largely of un-grazed grassland dominated by couch-grass, with scattered areas of reedbed. It contains three roost sites.

Roost 8 – South bank of Frampton Pill

- 5.139. This is an area of long grass and reedbed outside of the flood bank. It was identified by Martin McGill as a Snipe roost, with typically around 10 birds present. This number of birds would meet the criteria for a Primary Roost if occupancy is 50% of the time or more. Given that Snipe are often overlooked unless flushed, the assumption made was that the criteria are met.

Roost 9 – Black Rock Breakwater

¹⁸ Habitat categories are from an unpublished reserve management map supplied by WWT.

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- 5.140. Although the main location for roosting birds here is the breakwater itself, birds from it can disperse onto the flood bank above when in larger numbers and when the tide covers the feature entirely¹⁹.
- 5.141. Typical species and numbers at Black Rock include 5-6 Shelduck, 1-2 oystercatcher, 1-2 Curlew, and 1-2 Whimbrel (on passage). However, it can periodically be host to between 50 and 70 Curlew, so has been classified as a Possible Primary Roost for this species.
- 5.142. Growth of couch-grass has made the immediate vicinity of the rocks unsuitable for small wading birds within the last two years but it is hoped that increased grazing by livestock could be reinstated to encourage these species to return.

Roost 10 – Middle Point

- 5.143. This area of reedbed and un-grazed grassland was identified as a Snipe roost, with 1-5 birds typically present. For the same reasons given for Roost 8, this was considered likely to be a Primary Roost.

Land between Middle Point and Purton Breakwater

- 5.144. This includes large areas of land between the flood bank and the estuary, including The Dumbles and The Warth. Both are classified as Atlantic Salt Pasture and are grazed seasonally by cattle.

Roost 11 – The Dumbles

- 5.145. This is a large area of pasture that is frequented by large numbers of waders and wildfowl. It is considered to be a Primary Roost for Bewick's Swans, White-fronted Goose, Wigeon, Golden Plover and Lapwing. Shoveler occur on the Dumbles scrape, in front of the Holden Tower at SO7184105087, when it is flooded. At times, numbers exceed the 1% population threshold for and SPA Primary Roost but the flock is not there frequently enough to qualify. The Dumbles is a non-Primary roost for Shelduck, Dunlin, Curlew, Grey Plover and Ringed Plover. Most birds of these species range widely over the area but Ringed Plover seek out patches of bare mud that are found at the south end and at the scrape.
- 5.146. Gulls regularly roost on the Dumbles, with lesser black-backed, herring and Great Black-backed Gulls regularly found close to the saltmarsh edge.
- 5.147. Common Cranes, part of a reintroduction program led by WWT, are now a regular sight on the Dumbles. A number of other non-Interest Species are found in large flocks, including Canada and Barnacle geese.

Roost 12 – The Warth

- 5.148. This is a similar area to the Dumbles but smaller in size. It is frequented by a similar range of species but in generally lower numbers. Interest Species present in numbers below the 1% SPA population threshold for a Primary Roost include Shelduck, Wigeon, Teal, Golden Plover, Lapwing, Knot, Dunlin, Curlew, Redshank and Turnstone. Observations during primary surveys at Purton in 2016-17 suggested that the Breakwater and a pool at the south end of this feature at SO7040104272 attract small numbers of wildfowl and waders of these listed species.

¹⁹ Dave Paynter, personal communication.

Roost 13 - Fields between the Fifty Acre and the Tack Piece

- 5.149. This includes the Severn Ground, the Stall House Ground, the Goose House Ground and the Ox Piece. The Severn Ground is an arable field whereas the other land parcels are “special Goose pasture” managed for the White-fronted Geese and Bewick’s Swans to graze. It forms a core daytime area for both species, which tend to be found wherever the fodder is most productive. The White-fronted Geese do not use the arable field but the Bewick’s Swans do.
- 5.150. These fields have been classified as a Primary Roost because of their importance to Bewick’s Swans and White-fronted Geese, with the entire wintering flock of the geese sometimes found there. Golden Plover, Lapwing, Dunlin and Snipe are also found here in large numbers towards the end of the winter, when the fields are at their wettest.

Roost 14 - The Tack Piece

- 5.151. The Tack Piece is described as permanent pasture on the reserve management map. It contains a long channel with a shallow pool that covers approximately 0.8ha. The banks of this feature are largely bare, probably due to fluctuating water levels and the erosive action of large numbers of birds roosting and feeding at the water’s edge. There is also a pond in the south corner that is fringed with beds of emergent vegetation. This was the location of the first nest of wild-living Common Cranes since the reintroduction program started. These standing water features, and the pasture itself, draw in a wide range of wetland birds. Periodically, Interest Species are present in large numbers. The Bewick’s Swans present are generally the same birds as those using the Dumbles (Roost 12). White-fronted Geese and Wigeon are also frequently found grazing on the pasture, whilst Pochard and Tufted Duck are ubiquitous. In times of flooding, particularly at the end of the winter, numbers of Shelduck, Teal, Shoveler, Pintail, Lapwing, Dunlin, Curlew and Redshank increase in response to more favourable feeding conditions. It is for this reason that The Tack Piece is considered to be a Primary Roost for all of the Interest Species listed above, probably with the exception of the diving ducks.

Roost 15 – Top New Piece

- 5.152. This land parcel contains a roughly V-shaped area of wetland covering approximately 5.6ha. This consists of shallow water with exposed mud at the north end and deeper pools and reedbed at the south end. Between the “arms” of this waterbody lies a wet grassland area. Roosting wildfowl and waders are found here, particularly along the north and east sides. Interest Species seen in large numbers include Wigeon, Gadwall, Teal, Mallard, Pintail, Shoveler, Pochard, Lapwing, Dunlin, Snipe and Black-tailed Godwit. Pintail appear in the greatest numbers when roosting on the estuary (see below) is not possible due to strong winds. The Top New Piece is considered to be a Primary Roost for all of the species listed above.

Roost 16 – Bottom New Piece

- 5.153. This field is described as “special Goose pasture” in the management map but it also contains a low-lying scrape along the north edge that attracts large numbers of Shelduck, Wigeon, Teal (up to 500 birds), Pintail, Shoveler, Tufted Duck, Golden Plover, Lapwing, Dunlin, Curlew, Redshank, Black-tailed Godwit and Snipe. The Bottom New Piece is considered to be a Primary Roost for all of these species.

Fields south of the Grounds

- 5.154. This includes The Tin Shed Ground, the Canal Ground and other fields adjacent to the Gloucester and Sharpness Canal, as well as un-named fields to the south of the South Lake. The Tin Shed Ground is an occasional feeding area for Lapwing but is not thought likely to be part of the Reserve Primary Roost so has not been mapped as such.

Roost 17 – The Canal Ground and adjacent fields

- 5.155. This was identified as an occasional feeding area for White-fronted Geese, which arrive early in the morning, as well as a number of other species of wildfowl and waders, including Lapwing, Dunlin and Black-tailed Godwit. When present, the White-fronted Geese are usually flushed from the area as the morning progresses and human activity on the canal increases. With the entire wintering flock spending approximately 5% of its time in this area, it does not qualify as a Primary Roost but the lack of many other undisturbed feeding areas outside of the main Reserve area makes this noteworthy.

Roost 18 - Fields north of Newground Lane

- 5.156. These fields are not part of WWT Slimbridge. They are occasionally used by Interest Species, notably Bewick's Swans and White-fronted Geese but also Lapwing and Dunlin. With half of the wintering flock of Bewick's Swans and the entire wintering flock of White-fronted Geese spending approximately 5% of their time in this area, it does not qualify as a Primary Roost but as for Roost 17, the lack of many other undisturbed feeding areas for this species outside of the main Reserve area makes this noteworthy.

Roost 19 – The Rushy Pen

- 5.157. The Rushy Pen is composed of two pools with a causeway between them and islands in both. It is one of the main night roosting areas for Bewick's Swans, which arrive in the late evening for the feed that is provided by WWT. The low number of counts where the 1% SPA population threshold was met in the 70 months of data provided is a reflection of the fact that many counts of the Rushy Pen birds may have taken place after the birds had departed to other parts of the site for the day.
- 5.158. The only species for which the Primary Roost criteria were met in the Rushy Pen was Tufted Duck. However, Gadwall, Mallard and Pintail came close to meeting the criteria and for this reason they have been included in the Primary Roost species assemblage for this part of the Sector.

Roost 20 – The South Lake

- 5.159. The South Lake is divided into three waterbodies – a deep pool at the north end which mainly attracts diving ducks and two shallower pools in the middle and at the south end which attract roosting wildfowl and waders, as well as gulls.
- 5.160. The South Lake meets the Primary Roost criteria for Gadwall, Mallard, Shoveler, Tufted Duck and Black-tailed Godwit. It is also an occasional night roost for between two and 10 Bewick's Swans and, when there are no floods on the Reserve and conditions on the estuary are unfavourable, the entire White-fronted Goose wintering flock can be found here, typically leaving at first light. As this may be the only safe roost for the geese when they use it, the South Lake is also considered to be a Primary Roost for this species.

Roost 21 – The Grounds

- 5.161. The Grounds is the area of the WWT site where the captive bird collection is kept. It also attracts wild birds, which are included in the WeBS count. It meets the Primary Roost criteria for Shelduck, Mallard and Tufted Duck. Wild Bewick's Swans occur on the Big Pen and Tundra Pen areas of the Grounds, in numbers above the 1% SPA population threshold but the data suggest that they are not there sufficiently often to be included in the Primary Roost.

Roost 22 – The Long Ground Pool

- 5.162. This counting area also includes the Canoe Trail and the Decoy. These waterbodies are largely fringed by reedbed and willow scrub, with more mature trees at the back of the Decoy. It meets the Primary Roost criteria for Gadwall and Tufted Duck. The Canoe Trail has also become an important roost site for Mallard since its construction a few years ago and it is likely that this species occurs there in numbers meeting or exceeding the 1% SPA population threshold for a Primary Roost.

The River

- 5.163. This sub-Sector is composed of all intertidal habitat that is either fully or partially covered by the high tide, depending on the tide height. Roosting sites were identified on two main areas, as follows:

Roost 23 – Accreting Saltmarsh

- 5.164. This large area encompasses all saltmarsh and intertidal mud around it that is found between Middle Point and the Royal Drift. It meets the Primary Roost criteria for Shelduck and Curlew, but Wigeon numbers nearly meet the criteria and it is possible that they would be met if the "blind spot" behind the saltmarsh island facing the Royal Drift were to be regularly counted. For this reason, Wigeon are included in the Primary Roost species assemblage.

Roost 24 – Frampton Sand

- 5.165. The generalised area mapped encompasses six main locations where Bewick's Swans, White-fronted Geese and Pintail are frequently seen roosting on sandflats at low tide. This is also an area where Bewick's Swans and white-fronted geese retreat to if disturbed from feeding areas inland. White-fronted Geese go to this area to take in grit and to night roost on calm nights. Given the importance of the area as a refuge from disturbance, it has been considered to be a Primary Roost site even though numbers are not consistently high and it is not necessarily used at high tide.

Sources of disturbance at WWT Slimbridge

- 5.166. The WWT reserve is the least disturbed area of the estuary within the study area, with visitors confined to safe viewing areas and wardens on hand to deal with any issues that may arise. However, disturbance of roosting and feeding birds was highlighted as a serious problem, albeit an intermittent one. Watercraft and aircraft are the main sources of disturbance, with single events having potentially major implications. Jet-skiers have been known to become stranded on intertidal mud and sand banks or to land on The Dumbles, with large-scale displacement of birds present as a consequence. In addition to this, surfers attempting to ride the bore and occasional walkers and birdwatchers trespass along the flood bank by the Hundred Acre, accessing from the canal towpath near to Splatt Bridge. One such event was credited with the desertion of a crane

nest in that area. Surfers accessing (trespassing) the river via Hock Ditch, at the north end of the Frampton Realignment (see previous section) will do so 1-1.5 hours before high tide, paddling downstream to Frampton Breakwater, thereby displacing feeding birds on the estuary adjacent to the Hundred Acre. This could happen several times a month, depending on the height of the bore.

- 5.167. Private helicopters attempt to land on the sand banks or fly low over the Dumbles and Warth. If this coincides with occupancy of Roost 24, injury of a significant proportion of the Bewick's Swan and White-fronted Goose wintering populations could occur. Paragliders have also been seen in the area but generally turn back before reaching the reserve.
- 5.168. As already noted for Roost 17, disturbance from the canal can also displace feeding flocks of white-fronted geese. However, the geese are not often present and this is unlikely therefore to affect their survival.

15411 Severn - Purton to Brims Pill – Uncounted Sector

General description

- 5.169. This Sector covers an area between the villages of Purton on the left bank and Etloe/ Gatcombe on the right bank. With the estuary in excess of 2km wide at the upstream end, this Sector was covered by two surveyors, one on each bank.
- 5.170. Habitat on the right bank of the river is predominantly pasture, but with some arable land and woodland. Brims Pill is set in a low-lying area located at the upstream end of the right bank and has a newly created wetland area owned by GWA on a field at SO698072. In winter 2016-17 this was largely composed of bare mud around pools connected by shallow channels. The land to the downstream end of the right bank rises steeply above a narrow strip of level land occupied by the railway line. This is wooded and therefore unsuitable for the majority of wetland birds.
- 5.171. The left bank land use is predominantly pasture. Riverside pasture that is subject to periodic inundation on the very highest tides is situated in a band varying in width between 40m at Kingston Pill and 130m wide at Tites Point (Purton breakwater). Grazing land continues downstream in an ever-narrowing band to an area behind a row of canal-side cottages (at approximately SO687044) and just short of a spillway from the canal to the river.
- 5.172. Footpaths take walkers to within a few metres of the shoreline for a short distance at SO688045 on the left bank and at SO688059 on the right bank but otherwise there is no public access to the river frontage on either bank.
- 5.173. This is a particularly dynamic Sector to count and it provides a view of a “blind spot” for Sector 15402 New Grounds, Slimbridge. The incoming tide creates a large “vortex” effect in the bay between Purton breakwater, the Royal Drift and the accreting saltmarsh forming to the south side of Frampton Sand. The strongest flow changes direction as the tide rises. Water flows very strongly in an anti-clockwise direction along a channel that runs between the shore at Oldmoor Cliff and a sand bank just north of it, but this flow is eventually overtaken by stronger flow in a clockwise direction from the main channel of the river beyond the breakwater.

Roosting birds

- 5.174. Large numbers of gulls have been seen drifting up river with the incoming tide. These were moving too fast to count accurately and mapping of their distribution was not considered worthwhile, given that no aggregations of birds actually remained in the Sector for any length of time. Hundreds of Wigeon have been seen from this Sector sheltering in the lee of the tide adjacent to the accreting saltmarsh in Sector 15402. The importance of this area for Wigeon and other wildfowl is described in the New Grounds section of this report (above).
- 5.175. Within this Sector, two roosts of significant Interest Species assemblages were identified. These are listed in Table 5.44 below.

Table 5.44: Roost sites in Sector 15411 – Purton to Brims Pill

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
1	Purton Foreshore	SO6971304512	Wildfowl waders and gulls	Muddy foreshore and open water adjacent to it	Possible
2	Brims Pill	SO6970907039	Wildfowl and waders	Pill mouth and channel with associated habitat.	No

Roost 1 – Purton Foreshore

- 5.176. This roost consists of a long section of open water and the foreshore upstream and downstream of Tites Point. Wigeon and Shelduck have been noted roosting at low tide on the mud by the upstream side of the breakwater and on the other side of a channel through a very large mud bank that extends to the Royal Drift. These birds, as well as small flocks and individuals from downstream of the Point, tend to be swept up by the incoming tide and accumulate along this foreshore in areas of slack water near to the shore. When the tide is very high, Wigeon start to graze and preen on the foreshore itself, which is composed of salt-tolerant pasture and bare mud. When the tide begins to drop, birds have been seen to fly from this foreshore, either to slack water and grazing pasture in Sector 15402 or to slack water at the downstream side of Tites Point. None of the flocks seen remained in the area for more than half an hour, although at times this may have been as a result of disturbance by the surveyor.
- 5.177. Numbers of Wigeon exceeded the 1% SPA population threshold for a Primary Roost on two surveys, with counts of 105 and 252. This qualified the area as a Possible Primary Roost, although the movements of birds were so dynamic that determining the boundary of the roost and the numbers of birds present was problematic.
- 5.178. Very low numbers of gulls were observed alighting in association with the wildfowl but hundreds were seen passing by on the water further out into the estuary or in flight.

Table 5.45: Species assemblage at Roost 15411-1, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-5	43	No	
Wigeon				0-252	57	Possible	
Curlew		Y	Y	0-6	14	No	
Black-headed Gull				0-32	14	-	
Common Gull				0-1	14	-	

5.179. Areas used by birds within this roost site are sufficiently far from public rights of way for disturbance from people and dogs to be insignificant.

Roost 2 – Brims Pill

5.180. This roost was determined to be the Pill itself and the habitat immediately along its banks. The main concentration of birds observed during surveys was at the Pill mouth, where wildfowl took refuge from the flow of the incoming tide.

5.181. None of the Interest Species present were found in numbers and regularity sufficient to qualify the site as a Primary Roost but it was occupied sufficiently often as to be considered worthy of note as a frequently used non-Primary Roost.

Table 5.46: Species assemblage at Roost 15411-2, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-4	14	No	
Wigeon		Y	Y	0-46	71	No	
Teal		Y		0-50	29	No	
Mallard		Y		0-13	57	No	
Oystercatcher				0-2	14	-	
Lapwing		Y		0-1	14	No	
Jack Snipe				0-1	14	-	
Snipe			Y	0-1	14	No	
Green Sandpiper				0-1	14	-	
Redshank	Y	Y	Y	0-2	14	No	

5.182. Brims Pill is not on or near to any public rights of way and is therefore not subject to frequent disturbance. The newly created wetland owned by GWA is not intended to be a shooting area, although it is frequented by members and so periodic disturbance of it may occur. A wildfowler was seen walking his dogs on the September visit and there were no birds present.

15409 Severn - Purton to Naas – Uncounted Sector

General Description

- 5.183. This sector covers an area from the centre of the river channel to the right bank, with Purton (Forest of Dean) at the upstream end and the mouth of Lydney Harbour at the downstream end. The land here rises steeply behind the railway that runs along the shore, with heavily wooded slopes that were being cut and stabilised throughout the survey period, presumably to ensure that no landslips would fall onto the railway. The area of intertidal habitat along this shore is very narrow, although outcrops of rock and muddy shorelines in small bays may be considered suitable for some species of roosting wildfowl.
- 5.184. This Sector was surveyed from the left bank at the same time as surveys for Sector 15410.

Roosting birds

- 5.185. No notable roosts were found in this Sector. In fact, no birds at all were recorded on most surveys. The low number of GDS records indicated that the primary surveys in 2016-17 were representative of wetland bird numbers generally.
- 5.186. This sector is not ordinarily subject to disturbance due to its isolation.

15410 Severn – Sharpness – Uncounted Sector

General Description

- 5.187. This Sector covers an area 2.5km upstream and 1.7km downstream of the entrance to Sharpness Dock. The upstream section consists of a wide band of un-grazed couch-dominated grassland and reedbed on accreted estuarine mud between the river and the Gloucester and Sharpness Canal bank. The reedbed area increases in width and dominance towards the Docks, with a tidal channel running parallel to the flood defences, which in this area consist of a high stone wall. The channel discharges to the estuary at SO671031, adjacent to the Severn Area Rescue Association (SARA) lifeboat station.
- 5.188. There is a section of intertidal mud, exposed rock and reedbed below a vegetated bank between SARA and the Docks. The Dock entrance has two large wooden and metal gantries built either side of it. Downstream of this is a wide area of saltmarsh and intertidal mud with less frequently flooded grassland that is probably grazed seasonally by cattle. Here there are two small Pill mouths discharging water to the estuary from adjacent farmland and a sewage treatment works.
- 5.189. Berkeley Pill is not part of the Sharpness Sector but is readily visible from it. Counts of this area were carried out as part of this survey to provide information supplementary to that given by the counter interview for that Sector (below).

Roosting birds

- 5.190. Within this Sector, four roosts of significant Interest Species assemblages were identified. These are listed in Table 5.47 below.

5.191. It is important to note that particularly high tides will completely cover the foreshore of the estuary downstream of the Docks and this can influence whether or not birds roost at all in that area. This was noted during the October 2016 survey, when the survey coincided with a 9.6m tide. This effectively cleared all birds from the south end of the sector, most of which appeared to go to what little habitat remained at Berkeley Pill. Conversely, very low tides such as that seen during the January survey leave exposed mud below the edge of the saltmarsh. This presents greater roosting and feeding opportunities for birds here.

Table 5.47: Roost sites in Sector 15410 – Sharpness

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
1	Upstream of SARA	SO6756703283	Mixed	Tidal reedbed, saltmarsh, bare mud and a tidal channel.	Possible
2	Piers at Sharpness Dock	SO6668002142	Mixed	Artificial structures built out into the estuary.	No
3	Pill mouth by STW	SO6662801308	Wildfowl and waders	Open water and saltmarsh.	Possible
4	Pill mouth	SO6660501132	Wildfowl	Open water and saltmarsh.	Possible

Roost 1 – Intertidal area upstream of SARA

5.192. This is a large area of intertidal habitat that is dominated by reedbeds. The accreted mud upon which this grows is seldom fully submerged at high tide but areas of saltmarsh and bare mud are regularly covered, including a channel that runs between the flood wall against the canal embankment and the reedbed. This discharges at the downstream end near to SARA, where it is considerably wider than at its upstream extremity. The area is difficult to count because the reedbed and scrub along the toe of the flood wall obscure views of roosting birds, so counts are likely to have been inaccurate. However, what could be seen is reported on here.

5.193. The roost was distributed along the channel described above as well as on saltmarsh on the other side of the reedbed facing the river, with concentrations of wildfowl at both the upstream and downstream ends. Numbers of Wigeon and Mallard exceeded the 1% SPA population threshold for a Primary Roost on two surveys, whilst Pintail, Snipe and Spotted Redshank did so on one survey each. This meant that the area could be classified as a Possible Primary Roost for these species.

Table 5.48: Species assemblage at Roost 15410-1, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Wigeon		Y	Y	0-237	71	Possible	
Teal		Y		0-1	14	No	
Mallard		Y		0-70	71	Possible	
Pintail		Y		0-7	29	Possible	
Grey Heron				0-3	29	-	
Snipe			Y	0-25	14	Possible	

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Curlew		Y	Y	0-2	57		
Spotted Redshank		Y		0-1	14	Possible	
Redshank	Y	Y	Y	0-8	57	No	
Black-headed Gull				0-30	14	-	
Common Gull				0-16	14	-	

- 5.194. Disturbance of this roosting area is relatively unlikely due to its isolation from rights of way. Birds roosting on the channel did not react to noise from the canal towpath. Boat traffic may occasionally cause birds roosting on the foreshore to flush but numbers involved are unlikely to be large.

Roost 2 – Piers at Sharpness Dock

- 5.195. The main interest for this roost was for the gull species there. All five of the species regularly occurring on the Severn were found, with Black-headed and Lesser Black-backed Gulls present on all surveys.

Table 5.49: Species assemblage at Roost 15410-2, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Cormorant				0-6	43	-	
Oystercatcher				0-2	14	-	
Black-headed Gull				12-105	100	-	
Common Gull				0-20	57	-	
Lesser Black-backed Gull				1-6	100	-	
Herring Gull				0-5	29	-	
Great Black-backed Gull				0-2	14	-	

- 5.196. Disturbance of the roost could take place as a result of maintenance operations on the piers but this is likely to be short-lived and carried out on a very infrequent basis. Birds were not disturbed by dock workers in hi-vis jackets seen on the north side of the dock entrance, so appear to be habituated to the sight of people.

Roost 3 – Pill mouth by the Sewage Treatment Works

- 5.197. The Pill mouth in this location offered a small area of sheltered slack water in which small numbers of wildfowl were seen. Waders were distributed either side of the Pill on upper saltmarsh. Wigeon numbers exceeded the 1% SPA population threshold for a Primary Roost once so this was categorised as a Possible Primary Roost.

Table 5.50: Species assemblage at Roost 15410-3, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Wigeon		Y	Y	0-101	57	Possible	
Mallard		Y		0-1	14	No	
Lapwing		Y		0-60	14	No	
Dunlin	Y	Y	Y	0-60	14	No	

- 5.198. The roost is subject to disturbance from walkers and dogs, which were seen on surveys in December to March. The disturbance events seen were relatively minor, with birds displaced from one area to another within the same sector.

Roost 4

- 5.199. This was in another Pill mouth 200m downstream from Roost 3. It was used only twice, by Shelduck and Wigeon. Wigeon numbers exceeded the 1% SPA population threshold for a Primary Roost so this was categorised as a Possible Primary Roost. It was thought possible that the roost may be used more regularly than the primary surveys suggested, particularly if birds were displaced from larger roosts sites such as at Berkeley Pill (see next section) although this itself is subject to the same disturbance risk as for Roost 3.

Table 5.51: Species assemblage at Roost 15410-4, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck					14		
Wigeon		Y	Y	0-90	14	Possible	

- 5.200. The Wigeon seen were flushed upstream to this location by a SARA rigid inflatable dingy that had entered Berkeley Pill, so used the roost as a result of disturbance. How often this occurs could not be determined.

15406 Berkeley Shore – Counted Sector

General Description

- 5.201. This Sector covers the area from Berkeley Pill to Severn House Farm, including the foreshore running past the former nuclear power station grounds. It is regularly counted by Geoff Moyser, a volunteer surveyor. Although a counted Sector, the Berkeley Pill part of it was covered by primary surveys in 2016-17, as described for the Sharpness Sector above. This was done for the sake of completeness at the time but it was subsequently found that Geoff only counts the south side of the Pill during his routine surveys, having assumed that a counter from the Sharpness section would count the north side.
- 5.202. The Sector is composed of a number of habitats. These include the large Pill at the north end that has saltmarsh and salt-water tolerant un-grazed grassland on its banks. There is an area of wet grassland and sedge bed fringed with scrub on the south bank of the Pill, inland of the flood bank.

Continuing south, the estuary frontage consists of a strip of saltmarsh along the shore line with a band of intertidal mud available to feeding birds at low tide. There is an improved grassland field inland of this, as well as an old oxbow of the Pill that was cut off by flood improvement works many years ago. Downstream of the old power station is an area of saltmarsh that is bounded by flood banks and a sea wall at the southern extremity.

Roosting birds

- 5.203. The interview and site visit with Geoff Moyser took place on 16th December 2016. Within this Sector, four roosts of significant Interest Species assemblages were identified. These are listed in Table 5.52 below.

Table 5.52: Roost sites in Sector 15406 – Berkeley Shore

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
1	Berkeley Pill	SO6640900111	Wildfowl and waders	Large tidal channel with saltmarsh and salt-tolerant un-grazed grassland on banks.	Yes
2	North of Power Station	ST6594799848	Wildfowl and waders	Mudflats, upper saltmarsh, boulder/ shingle shore and open water	Possible
3	South of Power Station	ST6536399047	Mixed	Wide area of saltmarsh	No
4	Below sea wall	ST6473998574	Wildfowl waders and gulls	Saltmarsh strip	No

Roost 1 – Berkeley Pill

- 5.204. This is a large tidal channel that provides a significant area of slack water and sheltered shore line for wildfowl and waders to roost. The dominant habitat is saltmarsh, with muddy banks and open water of the Pill itself.
- 5.205. The species assemblage as described by Geoff Moyser is shown in Table 5.53 below. This indicates that Berkeley Pill is a Primary Roost for Wigeon and Snipe.
- 5.206. The roost assemblage as recorded during the primary surveys of 2016-17 is shown in Table 5.54 below. Wigeon numbers exceeded the 1% SPA population threshold for a Primary roost on four of the surveys whereas Snipe did so on only two surveys of three when they were noted to be present. However, this was considered likely to be an under-count on surveys when birds were not flushed, so the assessment of the site was that it was indeed a Primary Roost for this species. The GDS records corroborate these findings.
- 5.207. Redshank numbers exceeded the 1% SPA population threshold for a Primary roost on one survey. This pattern of use was similar to that reported by Geoff Moyser, with numbers at or above 40 on peak high tide counts. There are only three counts on the GDS with numbers exceeding the 1% SPA population threshold, although there are several counts where numbers are close to this. The site was determined on the basis of this information to be a Possible Primary Roost for this species.

Table 5.53: Species assemblage at Roost 15406 – 1, based on the counter interview

Species	Status			Number of birds*	% presence at roost site	Count during site visit	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI					
Wigeon		Y	Y	120 (126)	75	118	Yes	
Teal		Y		10 (26)	50	11	No	
Lapwing		Y		50 (50)	10	51	No	
Dunlin	Y	Y	Y	25 (25)	20	23	No	
Jack Snipe				2 (2)	20		-	
Snipe			Y	6 (20)	50		Yes	
Redshank	Y	Y	Y	25 (40)	90	22	No	

* Numbers given are typical counts at high tide. Numbers in brackets are peak counts at high tide

Table 5.54: Species assemblage at Roost 15406 -1, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-3	29	No	
Wigeon		Y	Y	0-515	86	Yes	
Teal		Y		0-25	86	No	
Mallard		Y		0-10	43	No	
Dunlin	Y	Y	Y	0-40	57	No	
Jack Snipe				0-1	14	-	
Snipe			Y	0-12	43	Possible	
Redshank	Y	Y	Y	1-50	100	Possible	
Black-headed Gull				0-3	14	-	

5.208. Berkeley Pill is subject to periodic disturbance from walkers and dogs but most appear to come from the Sharpness end and turn back before reaching the Pill. The only records of disturbance from walkers during primary surveys in 2016-17 were caused by the surveyor. Birds were displaced within the Pill itself but more damaging disturbance could occur if a dog were to be present.

5.209. As noted for the Sharpness Sector, there was one incident of major disturbance caused by a small boat being driven into the mouth of the Pill in November 2016. This resulted in the displacement of all birds from the roost, with Wigeon at least flying upstream to a smaller pill mouth. How often such disturbance takes place could not be determined but the fact that this was a SARA boat from Sharpness suggested that it may be regular.

Roost 2 – North of Power Station

5.210. This area contains a number of habitats used by roosting birds, including mudflats, upper saltmarsh, a boulder/ shingle shore and open water. Until 20 years ago, there was also a metal gantry in the estuary that attracted a range of species. This was dismantled.

- 5.211. Numbers of Mallard can exceed the 1% SPA population threshold for a Primary Roost but the percentage of counts when this would be the case was not certain, so the site was considered to be a Possible Primary Roost for this species.

Table 5.55: Species assemblage at Roost 15406 – 2, based on the counter interview

Species	Status			Number of birds*	% presence at roost site	Count during site visit	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI					
Mallard		Y		4-50 (80)	100	33	Possible	
Dunlin	Y	Y	Y	6 (6)	30	0	No	
Curlew		Y	Y	1 (1)	80	0	No	
Turnstone			Y	4 (4)	10	0	-	

* Numbers given are typical counts at high tide. Numbers in brackets are peak counts at high tide

- 5.212. There is very little disturbance to this roost, although a clay pigeon shoot does take place on an adjacent field. Typically, however, this occurs on low tides.

Roost 3 – South of Power Station

- 5.213. This is a wide expanse of saltmarsh with areas of exposed intertidal mud and a shallow pool. It is the largest area of upper estuarine habitat in the Sector. None of the Interest Species meet or exceed their 1% SPA population thresholds for a Primary Roost so this was classified as a non-Primary Roost.

Table 5.56: Species assemblage at Roost 15406 – 3, based on the counter interview

Species	Status			Number of birds*	% presence at roost site	Count during site visit	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI					
Shelduck	Y	Y		1 (20)	90	1	No	
Greylag Goose						22	-	Not mentioned during interview
Canada Goose				4-30 (285)	90	4	-	
Grey Heron						1	-	Not mentioned during interview
Lapwing		Y		40 (40)	50		No	
Curlew		Y	Y	1-3 (1-3)	90	1	No	
Turnstone			Y	6 (20)	20		No	

* Numbers given are typical counts at high tide. Numbers in brackets are peak counts at high tide

- 5.214. Disturbance of the roost can be frequent, with the adjacent footpath being popular with dog walkers, many of whom allow their animals to roam over the saltmarsh. The Berkeley Hunt occasionally visits the area (maximum of once a month). The result of these disturbance events is that all birds present vacate the site.

Roost 4 – Below sea wall

- 5.215. This is a narrow band of saltmarsh and mud below the sea wall. It is only occupied occasionally and typically there are no birds present. None of the Interest Species meet or exceed their 1% SPA population thresholds for a Primary Roost so this was classified as a non-Primary Roost.

Table 5.57: Species assemblage at Roost 15406 – 4, based on the counter interview

Species	Status			Number of birds*	% presence at roost site	Count during site visit	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI					
Mallard		Y		0 (4)	20	0	No	
Curlew		Y	Y	0 (1)	10	0	No	
Black-headed Gull				0 (200)	10	0	-	

* Numbers given are typical counts at high tide. Numbers in brackets are peak counts at high tide

- 5.216. Disturbance of the roost is largely from the footpath on the top of the sea wall. Walkers pass by approximately three times a week.

Desk Study findings for the Sector

- 5.217. Many of the records on the GDS do not specify exactly where birds were, so this section gives a summary of these records for the Sector as a whole.
- 5.218. Species mentioned in the interview and/or seen during the site visit that have been seen in numbers equalling or exceeding the 1% population threshold for a Primary Roost include Teal, Lapwing, Curlew, Dunlin and Turnstone.
- 5.219. Species mentioned in the interview and/or seen during the site visit that have not been seen in numbers equalling or exceeding the 1% population threshold for a Primary Roost include Shelduck.
- 5.220. Species not discussed at the interview or seen on the site visit that have been recorded in the Sector in numbers equalling or exceeding the 1% population threshold include Gadwall, Grey Plover, Ringed Plover, Whimbrel, Spotted Redshank and Golden Plover.
- 5.221. Species not discussed at the interview or seen on the site visit that have not been recorded in the Sector in numbers equalling or exceeding the 1% population threshold include Knot, Black-tailed Godwit.

15203 Lydney Harbour Pools – Uncounted Sector

General Description

- 5.222. These two large waterbodies are fishing lakes, both of which are private fisheries. These were viewed from publically accessible areas for all counts made in 2016-17. The lakes are fringed with emergent vegetation and willow scrub. They are completely separate from the SPA and the estuary as a whole.

Roosting birds

- 5.223. All birds found using the lakes were considered to be roosting in the broadest sense defined in Section 3.0 of this report. This was particularly important for defining the importance of the site to the SPA populations of diving ducks that were present, both of which were found nowhere else in the survey area other than at WWT Slimbridge.
- 5.224. Only one of the lakes was found to contain significant numbers of Interest Species.

Table 5.58: Roost sites in Sector 15203 – Lydney Harbour Pools

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
1	Private lake	SO6381901824	Wildfowl	Large fishing lake with emergent vegetation and scrub	Yes

Roost 1

- 5.225. The larger of the two lakes, this was made up of open water with fringing reedbeds, other emergent vegetation and scrub. It also contained vegetated islands.
- 5.226. Tufted Duck numbers exceeded the 1% SPA population threshold for a Primary roost on four of the surveys, making this a Primary Roost for this species. GDS records corroborate this finding, although there were only four counts exceeding the threshold available. One count of Shoveler during the primary surveys reached the threshold, making this a Possible Primary Roost for this species.
- 5.227. GDS records show that Mallard have been recorded in numbers exceeding the 1% SPA population threshold, so the importance of the site to this species could be greater than that indicated by the primary surveys.
- 5.228. Gull numbers during primary surveys were significantly less than some of the counts on the GDS. Black-headed Gull in particular has occurred in much larger numbers.

Table 5.59: Species assemblage at Roost 15203 - 1, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Mute Swan				2-28	100	-	
Greylag Goose				0-20	29	-	
Canada Goose				0-22	86	-	
Wigeon		Y	Y	0-8	29	No	
Mallard		Y		0-11	86	No	
Shoveler		Y		0-5	14	Possible	
Pochard		Y		0-2	14	No	
Tufted Duck		Y		0-32	86	Yes	
Little Grebe				0-1	29	-	
Great Crested Grebe				0-6	71	-	
Cormorant				0-4	71	-	

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Grey Heron				0-1	14	-	
Moorhen				0-8	71	-	
Coot				6-35	100	-	
Black-headed Gull				0-200	86	-	
Common Gull				0-2	14	-	
Lesser Black-backed Gull				0-4	43	-	
Herring Gull				0-56	43	-	

- 5.229. Disturbance of birds on Roost 1 was thought likely to be relatively constant, with anglers passing along the shore of the lake on a frequent basis in daylight (and perhaps also in night time) hours. Birds were clearly habituated to this.
- 5.230. Interest Species recorded on the GDS at Lydney Harbour Pools that were not recorded during the primary surveys in 2016-17 and which have reached or exceeded their respective 1% SPA population thresholds include Gadwall.
- 5.231. Interest Species recorded on the GDS at Lydney Harbour Pools that were not recorded during the primary surveys in 2016-17 and which have not reached or exceeded their respective 1% SPA population thresholds include Shelduck.

15408 Severn - Lydney Marsh

General Description

- 5.232. This Sector covers much of the Lydney Park Estate south of the Gloucester to Cardiff railway line to the estuary, incorporating part of Lydney Sand. The boundary runs along a canal to the east side and Warth Brook on the west. An area of land between the flood bank and the estuary measures between 30 and 100m wide and is subject to periodic flooding on very high tides. The erosive effect of this can be seen from how, in certain locations, rock armouring placed on the foreshore to protect it in the past has been left standing high above the current ground level. The land here is cattle-grazed pasture consisting of a salt-water tolerant sward and some saltmarsh areas around scrapes. Land use inland of the flood bank is predominantly arable and improved pasture, with large game rearing pens and cover crops indicating a strong shooting interest. Pheasants and red-legged partridges were abundant during the primary survey period.
- 5.233. Included within the counts, but officially not part of the counting Sector, was a sewage treatment works in the north corner.
- 5.234. Lydney Sand was either fully covered or nearly covered by the incoming tide during all surveys. This area has been highlighted by studies by John Sanders as an important feeding area for Curlew prior to roosting at Aylburton Warth and Guscar (see next Sector). This importance was not noted during the primary surveys due to their timing relative to high tide.

Roosting birds

- 5.235. Small numbers of Interest Species were counted across the Sector but few records were of groups of birds large enough or seen frequently enough to warrant being mapped. Of particular note, however, were at least three improved pasture fields to the north and west sides of the Sector (centred at NGRs SO626009, SO621006 and SO623002) in which feeding Curlew in flocks approaching the 1% SPA population threshold for Primary Roosts were seen, each on just one survey each. These fields may form part of a wider inland area used by feeding Curlew dispersing from the main roosts at Aylburton Warth and Guscar Rocks (see next section of this report). The GDS records show that larger flocks of Curlew can occur at Lydney Marsh but probably not frequently, with better roosting and feeding habitat available nearby.
- 5.236. The GDS records suggest that Lydney Marsh is not an important area for the Interest Species, although there have been limited numbers of counts of Wigeon, Lapwing, Golden Plover, Snipe, Whimbrel that equal or exceed the 1% SPA population threshold for a Primary Roost.
- 5.237. Large mobile flocks and small infrequently used roosts of gulls were noted but not mapped. The only consistently used roost within or adjacent to the Sector was as follows:

Table 5.60: Roost sites in Sector 15408 – Lydney Marsh

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
1	Sewage treatment works	SO6330701651	Gulls	Buildings and clinker beds	-

Roost 1 – the Sewage Treatment Works

- 5.238. This roost was occupied by gulls only, with two species present during primary surveys. It consisted of buildings and clinker beds used to purify water.

Table 5.61: Species assemblage at Roost 15408 - 1, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Black-headed Gull				0-35	86	-	
Herring Gull				0-10	29	-	

- 5.239. There is no public access to the sewage treatment works so disturbance is most likely to derive from its normal operation. However, the gull species concerned are generally habituated to people and are unlikely to be harmed by periodic displacement.
- 5.240. The Sector as a whole is subject to periodic disturbance along the flood bank, where pedestrians and cyclists have walked along a permissive path to Alvington from Lydney Harbour. As few birds appear to be regularly present to be disturbed, this may have a limited significance. However, the impact on roosts in the adjacent Sector may be more severe.

General Description

5.241. This Sector takes in a large area of land that is owned by the Environment Agency (EA), as well as arable and pastoral farmland along the estuary edge and inland of the Gloucester to Cardiff railway line. The EA land is a project area for “managed re-alignment” where, since 2013, flood banks have been breached to allow water from high tides to flood formerly drained land once again, with the intention of re-creating intertidal habitat such as saltmarsh. The foreshore at Aylburton continues to suffer significant erosion that is changing the shape and extent of habitat above the mean high tide mark.

Roosting birds

5.242. Aylburton Warth and Guscar Rocks are widely considered to be amongst the most important wader roosts upstream of the Severn bridges. The results of the surveys in 2016-17 confirmed this, as did surveys carried out by John Sanders in the same period. Roosting areas identified under this study include a number of sites across the Sector but there are two main locations, at the end of Aylburton Warth and the foreshore facing Guscar Rocks to the east side of Grange Pill. This area has the capacity to be of similar value to WWT Slimbridge but both Aylburton Warth and Guscar are subject to disturbance from a number of sources from un-challenged unofficial users, as detailed below. Disturbance is probably the single most important factor preventing the area achieving its full potential as a refuge site for SPA birds.

5.243. This Sector is 4.5km long and was counted by two surveyors to ensure that interchange of roosting flocks between Aylburton Warth and Guscar was recorded and taken account of in the final tally. This interchange has been noted by several observers in the past, who have seen birds moving in response to disturbance and/or the availability of roosting areas on particularly high tides. Birds (predominantly Curlew) will also fly down to Wibdon Wharf (see the next section of this report) and the counts in both Sectors were co-ordinated for the same reason.

5.244. This Sector, along with Wibdon Wharf, is one of the most important roosting areas for Curlew in the study area. The birds present seldom remain in one location for very long, with large-scale movements between roosts and inland to feed occurring regularly, in response to the tide, weather and disturbance. This made accurate counts problematic and all totals for this species are estimates only, with double counting between roosts possible. Detailed notes on bird movements were taken to try to reduce the likelihood of this being the case so that totals submitted to the WeBS Scheme after completion of the project were as accurate as possible. It should be noted, however, that numbers reported for individual roosts given below do not take account of double counting because it is roost usage that is considered important under the remit of this project rather than total numbers.

5.245. Mapping of sites at Aylburton was hampered by the fact that a large part of the foreshore shown on the OS base plan has now eroded away. The extent of the foreshore in 2013, as shown in a base plan produced by the EA²⁰, was used to re-define the shore line on base mapping but even this has eroded further since that time.

²⁰ Severn Vale Managed Realignment Project Area map dated April 2013. Unpublished.

Table 5.62: Roost sites in Sector 15404 – Aylburton to Guscar

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
1	Warth peninsula	ST6197899669	Mixed	Peninsula of grazing land and saltmarsh	Possible
2	Warth Brook	ST6167499670	Wildfowl and waders	Pill mouth and associated mud banks	No
3	Warth shore	ST6154599689	Mixed	Saltmarsh, unimproved grassland and a scrape	Possible
4		ST6126899864	Mixed	Developing saltmarsh	Yes
5		ST6109099293	Mixed	Unimproved grassland	No
6	Rodmore Mead	SO6153300757		Improved and unimproved grassland	Possible
7		ST6102699987	Wader	Unimproved grassland	No
8	Cone Pill	ST6075299376	Mixed	Tidal channel with exposed mud and saltmarsh	Possible
9		ST6025698872	Waders and gulls	Unimproved grassland with a scrape	No
10	Guscar East	ST6003498473	Mixed	Saltmarsh, mud and open water	Possible
11		ST5980498594	Waders	Arable field	No
12	Guscar West	ST5956798229	Mixed	Unimproved field, slumping earth banks, saltmarsh, mud and open water	Yes
13		ST5949298454	Waders	Unimproved field	Possible

Roost 1 – Warth peninsula

- 5.246. This roost lies on a peninsula of land at the east end of Aylburton Warth. The habitat is a mixture of saltmarsh and unimproved grassland that is periodically grazed by livestock. It is the most remote part of the Warth and is often occupied by large numbers of waders, principally Curlew. During the primary surveys in 2016-17 the value of the roost to this species was probably not well represented, with birds present on only three of the surveys. Counts were 550 in September, 200 in October and 6 in November. These counts qualify the site as Possible Primary Roost for this species, although GDS records (see below, under Desk Study results for Aylburton Warth) suggest that this and/or other parts of the Warth, should be classified as Primary Roost(s). John Sanders' counts in the 2016-17 period recorded in excess of 300 on a number of occasions.
- 5.247. Golden Plover numbers exceeded the 1% SPA population threshold but on only three surveys, qualifying the site as a Possible Primary Roost for this species.

Table 5.63: Species assemblage at Roost 15404 - 1, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-3	14	No	
Grey Heron				0-7	14	-	
Golden Plover				0-195	43	Possible	
Curlew		Y	Y	0-550	57	Possible	GDS suggests Primary Roost
Redshank	Y	Y	Y	0-2	14	No	
Turnstone			Y	0-2	14	No	
Great Black-backed Gull				0-2	14	-	

5.248. The low count of Curlew in November 2016 coincided with the presence of a wildfowler and his dog, who were hunting along the south bank of the Warth Brook (see Roost 2 below). The Curlew were the only birds present at Roost 1 at the time. This incident, and two others recorded by John Sanders, are illustrative of the issues facing roosting birds in this location, which in spite of its isolation, is still subject to periodic disturbance. Wildfowling is not allowed anywhere on EA land.

Roost 2 – Warth Brook

5.249. This is a deep tidal channel that would be more accurately described as a pill. It was not easy to observe and counts of birds found there may have been inaccurate.

5.250. Redshank numbers equalled the 1% SPA threshold for a Primary Roost on one count. The site therefore qualified as a Possible Primary Roost for this species.

Table 5.64: Species assemblage at Roost 15404 - 2, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-9	14	No	
Wigeon		Y	Y	0-40	14	No	
Teal		Y		0-42	29	No	
Goosander				0-1	14	-	
Dunlin	Y	Y	Y	0-2	14	No	
Redshank	Y	Y	Y	0-40	14	Possible	

5.251. The wildfowler seen during the November 2016 count flushed the only roosting Redshank seen during the surveys.

Roost 3 – Warth shore

5.252. This consisted of the eroding foreshore with saltmarsh, unimproved grassland and a scrape. It is a wide area with birds typically scattered across it, but with notable concentrations around the scrape, which is located at approximately ST613997.

- 5.253. The area qualified as a Possible Primary Roost for Teal, Golden Plover, Lapwing and Curlew. Three of the four counts of Curlew were above the 1% SPA population threshold for a Primary Roost, whilst the fourth count was very close the threshold, suggesting that this is in fact a Primary Roost for the species.

Table 5.65: Species assemblage at Roost 15404 - 3, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-26	71	No	
Wigeon		Y	Y	0-32	14	No	
Teal		Y		0-135	14	Possible	
Little Egret				0-2	29	-	
Golden Plover				0-105	29	Possible	
Lapwing		Y		0-132	57	Possible	
Dunlin	Y	Y	Y	0-7	14	No	
Ruff				0-1	14	-	
Curlew		Y	Y	0-200	57	Possible	Very close to classification as a Primary Roost
Redshank	Y	Y	Y	0-2	29	No	

- 5.254. No specific disturbance effects on this roost were noted.

Roost 4

- 5.255. This was within fields subject to tidal inundation since the breaches of the flood banks were made in 2013-14. Saltmarsh was beginning to regenerate here but a mosaic of vegetation was present.
- 5.256. Snipe occurred in sufficient number and with sufficient frequency to qualify the area as a Primary Roost for this species. All five counts where birds were present were above the 1% SPA threshold. These were 7, 19, 83, 56 and 50 birds respectively.

Table 5.66: Species assemblage at Roost 15404 - 4, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Lapwing		Y		0-20	29	No	
Jack Snipe				0-1	14	-	
Snipe			Y	0-83	71	Yes	
Black-headed Gull				0-70	14	-	

- 5.257. The high counts of Snipe were achieved by the surveyor flushing them. Apart from this disturbance, none was noted.

Roost 5

- 5.258. This roost, on what is now a promontory of land at the end of the actively eroding estuary frontage, was occupied by small numbers of grey heron on two surveys. It is only included in this

report because, in the experience of observers who made up the survey team, this location can be used by large numbers of Curlew when other sites nearby are unsuitable for roosting²¹. It probably does not fulfil the criteria for a Primary Roost because it is not used frequently enough but it could assume a significance beyond that indicated by the criteria if it becomes the only roosting site available.

Roost 6 – Rodmore Mead

- 5.259. This roost is a wide area of improved and unimproved grassland, with marshy grassland to the south end. Curlew were observed flying to it from roosts on Aylburton Warth on three of the surveys, with one of the estimates (in January) exceeding the 1% SPA population threshold for a Primary Roost, qualifying the area as a Possible Primary Roost for this species.

Table 5.67: Species assemblage at Roost 15404 - 6, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Lapwing		Y		0-53	14	No	
Curlew		Y	Y	0-113	43	Possible	

- 5.260. No specific disturbance effects on this roost were noted.

Roost 7

- 5.261. This roost was recorded only once but is included here because of its proximity to the main roosts at Aylburton and Guscar. It is possible that this area, an unimproved grassland field, could be used more often than was indicated by the primary surveys in 2016-17. The GDS contains one record of 80 birds in a field to west of the railway line at high tide at Alvington Court, equating roughly to this area or to that of Roost 6.

Table 5.68: Species assemblage at Roost 15404 - 7, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Curlew		Y	Y	0-35	14	No	

- 5.262. No specific disturbance effects on this roost were noted.

Roost 8 – Cone Pill

- 5.263. This is a deep and wide-mouthed pill with exposed mud and upper saltmarsh on its banks. Teal occurred there in numbers exceeding the 1% SPA population threshold for a Primary Roost on three surveys, making this a Possible Primary Roost for this species.

²¹ Mike Smart, personal communication

Table 5.69: Species assemblage at Roost 15404 - 8, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Wigeon		Y	Y	0-50	14	No	
Teal		Y		0-150	71	Possible	
Grey Heron				0-1	14	-	
Redshank	Y	Y	Y	0-13	71	No	

- 5.264. A yacht from Thornbury Sailing Club entered the Pill during one of the surveys. This was moored and remained in place for the duration of the survey. The surveyor was unable to verify whether or not disturbance took place as a result but there were no birds present when he was able to get to a vantage point.

Roost 9

- 5.265. This roost was recorded only once but is included here because of its proximity to the main roost at Guscar. It is possible that this area, an unimproved grassland field with a scrape, could be used more often than was indicated by the primary surveys in 2016-17.

Table 5.70: Species assemblage at Roost 15404 - 9, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Curlew		Y	Y	0-57	14	No	
Black-headed Gull				0-11	14	-	

- 5.266. No specific disturbance effects on this roost were noted.

Roost 10 – Guscar East

- 5.267. This included the foreshore opposite Guscar Rocks on the east side of an un-named pill at ST597984. Habitats present were saltmarsh, a muddy shoreline, the extent of which varied depending on the height of the tide, and open water. On its own, this area did not contain Interest Species in numbers sufficiently great or sufficiently often to qualify as a Primary Roost. However, Snipe occurred at or above the 1% SPA population threshold on two out of three surveys when present so the area qualified as a Possible Primary Roost for this species.

Table 5.71: Species assemblage at Roost 15404 - 10, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Teal		Y		0-3	14	No	
Grey Heron				0-1	14	-	
Oystercatcher				0-2	29	-	
Golden Plover				0-1	14	No	
Lapwing		Y		0-58	43	No	
Dunlin	Y	Y	Y	0-101	43	No	
Snipe			Y	0-4	43	Possible	
Redshank	Y	Y	Y	0-12	57	No	

- 5.268. Disturbance effects on this roost that were noted were largely due to the presence of the surveyor, but also a single event of a ship's horn blast. Most bird movements resulting from this disturbance were localised and small-scale.

Roost 11

- 5.269. This is an arable field that was a non-Primary Roost for Lapwing. It is adjacent to the main roost at Guscar (see Roost 12) and may be used extensively by this species and others at certain times, hence its inclusion here.

Table 5.72: Species assemblage at Roost 15404 - 11, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Lapwing		Y		0-68	43	No	

- 5.270. No specific disturbance effects on this roost were noted, although it is in very close proximity to the main roost on the other side of the pill (see Roost 12) which is regularly disturbed.

Roost 12 – Guscar West

- 5.271. This is the main roost site at Guscar. Very large numbers of Curlew and lower numbers of other species regularly occur here on shallow water, exposed mud, saltmarsh, slumping earth banks and the grazed unimproved field above.
- 5.272. The roost contained numbers of Curlew at or above the 1% SPA population threshold sufficiently often to qualify it as a Primary Roost. The peak count was 835 in September, with counts of 19, 38, 58, 93 and 250 on the other five surveys when the species was present. The large number of counts on the GDS that were above the 1% threshold indicate that this assessment is correct. Of the 75 counts carried out by John Sanders in the 2016-17 period, 49 (63%) were of numbers exceeding the 1% SPA population threshold for a Primary Roost. There were 39 counts in excess of 100 birds and 12 counts in excess of 400 birds. The two highest counts were of 700 birds each.
- 5.273. Numbers of Wigeon, Teal, Lapwing and Snipe exceeded the 1% SPA population threshold on at least one survey, making this a Possible Primary Roost for these species. The GDS contains a

limited number of counts of Wigeon and Teal equalling or exceeding the 1% SPA population threshold in the area of Guscar, suggesting that this assessment is correct.

Table 5.73: Species assemblage at Roost 15404 - 12, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-20	43	No	
Wigeon		Y	Y	0-260	71	Possible	
Teal		Y		0-85	57	Possible	
Mallard		Y		0-6	14	No	
Grey Heron				0-4	43	-	
Oystercatcher				0-2	57	-	
Grey Plover				0-1	14	No	
Lapwing		Y		0-168	29	Possible	
Dunlin	Y	Y	Y	0-104	86	No	
Snipe			Y	0-6	29	Possible	
Bar-tailed Godwit				0-3	14	-	
Curlew		Y	Y	0-835	86	Yes	
Redshank	Y	Y	Y	0-33	86	No	
Black-headed Gull				0-156	29	-	
Common Gull				0-2	29	-	

The roost was subjected to disturbance during three out of seven of the primary surveys, in November, December and March. Sources of disturbance were river traffic (once) and a dog (twice). Typically, the roost was abandoned, waders flew upstream and wildfowl out to open water in the estuary. Disturbance has been noted on multiple occasions in the past, with 21 of the 75 counts carried out by John Sanders in 2016-17 disrupted by dog walkers (12 times), walkers (twice), wildfowlers (3 times), aircraft (3 times) and a hovercraft (once),

- 5.274. Disturbance from sailing craft can also occur, with boats from Thornbury Sailing Club sometimes accumulating in the area of this roost at high tide. When this occurs, the roost is abandoned.

Roost 13

- 5.275. This is an unimproved grassland field adjacent to Roost 12. It contained flocks of Curlew during two surveys that exceeded the 1% SPA population threshold for a Primary Roost (86 and 156 birds respectively), making this a Possible Primary Roost.

Table 5.74: Species assemblage at Roost 15404 - 13, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Curlew		Y	Y	0-156	29	Possible	

- 5.276. The birds were disturbed by agricultural activity on one of the counts and flew upstream towards Aylburton.

Desk Study Results for Aylburton Warth

- 5.277. Most records on the GDS do not specify where birds were on Aylburton Warth, so a summary relating to the area as a whole is given here.
- 5.278. Numbers of Shelduck, Teal and Gadwall have exceeded the 1% SPA population threshold on a small proportion of the counts submitted to the GDS so it is considered unlikely that the Warth is a Primary Roost for these species. Low numbers of Mallard and Shoveler have also been recorded.
- 5.279. There are 45 GDS records of Curlew at Aylburton Warth where numbers met or exceeded the 1% SPA population threshold for a Primary Roost. The exact locations of the birds recorded are not specified but it is considered likely that many of them relate to the peninsula area of Roost 1 or the foreshore and scrape of Roost 3. Numbers ranged between 10 and 800 in spring, 50 and 325 in autumn and 115 and 600 in winter. These records suggest strongly that all of the Warth is a Primary Roost in spite of the findings of the surveys in 2016-17.
- 5.280. Species recorded during the surveys that have been seen at other times in numbers equalling or exceeding the 1% population threshold for a Primary Roost include Golden Plover, Ringed Plover, Lapwing, Dunlin, Whimbrel, Snipe and Turnstone.
- 5.281. Species recorded during the surveys that have not been seen at other times in numbers equalling or exceeding the 1% population threshold for a Primary Roost include Redshank.
- 5.282. Species not recorded during the surveys that have been recorded at Aylburton Warth at other times in numbers equalling or exceeding the 1% population threshold include Whimbrel.

Desk Study Results for Guscar

- 5.283. Some records on the GDS do not specify where birds were at Guscar, so a summary relating to the area as a whole is given here.
- 5.284. Species recorded during the surveys that have been seen at other times in numbers equalling or exceeding the 1% population threshold for a Primary Roost include Golden Plover, Ringed Plover, Lapwing and Snipe.
- 5.285. Species recorded during the surveys that have not been seen at other times in numbers equalling or exceeding the 1% population threshold for a Primary Roost include Dunlin and Redshank.
- 5.286. Species not recorded during the surveys that have been recorded at Guscar at other times in numbers equalling or exceeding the 1% population threshold include Knot, Whimbrel and Turnstone.

15405 Severn - Wibdon Wharf - Uncounted Sector

General Description

- 5.287. This is a long section of estuary frontage composed largely of unimproved grassland that is cut for hay or silage and aftermath grazed. There are also areas of un-grazed salt-tolerant grassland at the upstream end. Other features of the Sector include eroding earth banks, four pill mouths and a rapidly rising area of land at the downstream end sweeping round to Pillhouse Rocks.

Roosting birds

- 5.288. Within this Sector, six roosts of significant Interest Species assemblages were identified. These are listed in Table 5.75 below.
- 5.289. Wibdon Wharf is a traditional site for Curlew, which are part of the population of birds that roost between here and Aylburton²². Large numbers have been predictable enough under certain tidal conditions that cannon-netting in order to colour ring birds was carried out here between 2010 and 2013. Of the 44 counts by John Sanders in 2016-17, 17 were of numbers equalling or exceeding the 1% SPA threshold for a Primary Roost for Curlew. Numbers were highly variable, with nil birds on 18 counts.
- 5.290. Six roosts of Interest Species, including Curlew, were found during primary surveys in 2016-17 as shown below.
- 5.291. Large numbers of black-headed and Common Gulls were noted drifting upstream on the incoming tide within this Sector. These flocks were considered too ephemeral to warrant mapping.

Table 5.75: Roost sites in Sector 15405 Wibdon Wharf

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
1	Horse Pill	ST5802097270	Wildfowl and Waders	Pill mouth with open slack water, mud and saltmarsh.	Possible
2		ST5790897172	Waders	Saltmarsh	Possible
3	Waldings Pill	ST5776197003	Wildfowl and Waders	Pill mouth with open slack water, mud and saltmarsh.	No
4	Broad Stone fields	ST5749997039	Wildfowl and Waders	Improved grassland	No
5	Un-named Pill	ST5747396668	Wildfowl and Waders	Pill mouth with open slack water, mud and saltmarsh.	Possible
6	The "traditional" Curlew roost	ST5718996323	Waders	Saltmarsh muddy shoreline, slumping un-vegetated earth banks and edge of unimproved grassland field.	Possible

Roost 1 – Horse Pill

- 5.292. This roost is located in the mouth of Horse Pill, where wildfowl were seen on open slack water and waders on saltmarsh and mud on the shoreline.
- 5.293. Wigeon and Teal were seen in numbers above the 1% SPA population threshold for these species once each, so the site was classified as a Possible Primary Roost for them.

²² Mike Smart, personal communication.

Table 5.76: Species assemblage at Roost 15405 - 1, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Wigeon		Y	Y	0-140	57	Possible	
Teal		Y		0-72	43	Possible	
Redshank	Y	Y	Y	0-5	29	No	

- 5.294. Although the surveyor flushed birds onto open water further out during counts, this is not a publicly accessible area and there were no signs of recent use by the landowner, it was considered unlikely to be regularly disturbed.

Roost 2

- 5.295. This area of saltmarsh was occupied briefly by a large flock of Curlew during the March survey. Birds had flown up from Roost 6 downstream of this location (see below) and were then flushed by a low-flying aircraft. The birds flew on towards Guscar.
- 5.296. Although very briefly occupied during the primary surveys, this site was classified as a Possible Primary Roost because of the number of birds present. Being isolated and undisturbed under normal circumstances, it may be used more often than was apparent in 2016-17.

Table 5.77: Species assemblage at Roost 15405 - 2, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Curlew		Y	Y	0-105	14	Possible	

Roost 3 - Waldings Pill

- 5.297. This roost is located in the mouth of Waldings Pill, where wildfowl were seen on open slack water and waders on saltmarsh and mud on the shoreline. Curlew were found on the unimproved field above the Pill.
- 5.298. None of the Interest Species present were seen in numbers above the 1% SPA population threshold, so the site was classified as a non-Primary Roost.

Table 5.78: Species assemblage at Roost 15405 - 3, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Wigeon		Y	Y	0-30	29	No	
Teal		Y		0-18	57	No	
Mallard		Y		0-11	14	No	
Curlew		Y	Y	0-9	14	No	
Redshank	Y	Y	Y	0-2	71	No	

5.299. Although the surveyor flushed birds onto open water further out during counts, this is not a publicly accessible area and there were no signs of recent use by the landowner, it was considered unlikely to be regularly disturbed.

Roost 4 – Broad Stone fields

5.300. This area of improved pasture was occupied by low numbers of Curlew and Shelduck during three of the surveys and is included here because there have been past records of Curlew feeding in the fields and they may have a greater significance than that which was apparent during the 2016-17 primary surveys. The GDS has limited evidence that this is the case, with a single count of 20 Curlew feeding in the fields to the west side of the railway, in the spring passage period. There are also two records referring to Whimbrel flying inland to feed in fields to the west of the railway line (45 and 80 birds, also on spring passage).

Table 5.79: Species assemblage at Roost 15405 - 4, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y	Y	0-1	14	No	
Curlew		Y	Y	0-15	29	No	

5.301. This area is not subject to disturbance other than periodic agricultural activity.

Roost 5 – un-named Pill

5.302. This roost is located in the mouth of an un-named Pill, where wildfowl were seen on open slack water and waders on saltmarsh and mud on the shoreline. One count of Teal exceeded the 1% SPA population threshold for a Primary Roost so this qualified the site as a Possible Primary Roost.

Table 5.80: Species assemblage at Roost 15405 - 5, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Wigeon		Y	Y	0-20	29	No	
Teal		Y		0-70	43	Possible	
Mallard		Y		0-6	14	No	
Redshank	Y	Y	Y	0-2	14	No	

5.303. Although the surveyor flushed birds onto open water further out during counts, this is not a publicly accessible area and there were no signs of recent used by the landowner, it was considered unlikely to be regularly disturbed.

Roost 6 – the “traditional” Curlew roost

5.304. This is the “traditional” site of the Curlew roost where cannon netting took place in 2010 to 2013. Habitat available to roosting birds here includes saltmarsh, a muddy shoreline, slumping un-vegetated earth banks and the edge of the unimproved grassland field, which had a low sward height through the survey period and was therefore considered to be optimal for Curlew roosting.

For the majority of surveys, there were no birds and no signs of recent occupancy found (e.g. feathers). Counts of Curlew of 11 in January and 105 in March qualified the site as a Possible Primary Roost under the criteria set out in the Methods. The higher numbers of birds counted by John Sanders in 2016-17 were in this general area, with 13 counts in excess of 100 birds.

- 5.305. There are 75 records on the GDS of Curlew from Wibdon Wharf, with numbers exceeding the 1% SPA population threshold on 62 occasions. These records are of numbers between 40 and 800. Of all the Curlew records, 47 are references to high tide counts. All of the roosting records are from the autumn or spring passage periods, with a single count in late winter.

Table 5.81: Species assemblage at Roost 15405 - 6, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Oystercatcher				0-2	14	-	
Curlew		Y	Y	0-105	43	Possible	

- 5.306. Signs of disturbance included recent quad bike tyre tracks and horse hoof marks, noted in December, January and February. These were probably signs of intermittent use by the landowner. John Sanders has recorded incidents of disturbance by horse riders and a birdwatcher but these were far fewer than at locations upstream.

Additional note on roosting birds at Wibdon Wharf

- 5.307. A single Snipe was flushed from the south field at Wibdon Wharf. This occurrence was not considered significant enough to warrant mapping but past records on the GDS suggest that the area may be of some importance to this species. There are four records of numbers equalling or exceeding the 1% SPA population threshold. With the sward height very low over the south field, the majority of any birds present were thought likely to be found at the north end, where grazing and mowing did not take place. No attempt was made to confirm this, partly because of access constraints and the time taken to complete the survey.

Additional notes on sources of disturbance at Wibdon Wharf

- 5.308. Although no direct disturbance of birds was noted during surveys, signs of uses that may cause disturbance periodically were noted in addition to the vehicle tracks and horse hoof marks already noted for Roost 6. Sea anglers were seen in November at the south end of the Wharf (at approximately ST568960). If such activities were to be frequent they may influence the regularity of use of Roosts 5 and 6. Fields further upstream appeared not to be in use for agricultural or any other purpose so are likely to be undisturbed for the vast majority of the time.

Summary of desk Study findings for Wibdon Wharf

- 5.309. Most records on the GDS do not specify where birds were on the Sector, so a summary relating to the area as a whole is given here.
- 5.310. Species recorded during the surveys that have been seen at other times in numbers equalling or exceeding the 1% population threshold for a Primary Roost include Shelduck, Wigeon, Teal, Mallard and Ringed Plover.

- 5.311. Species recorded during the surveys that have not been seen at other times in numbers equalling or exceeding the 1% population threshold for a Primary Roost include Redshank.
- 5.312. Species not recorded during the surveys that have been recorded at Wibdon Wharf at other times in numbers equalling or exceeding the 1% population threshold include Whimbrel.
- 5.313. Species not recorded during the surveys that have been seen at other times but not in numbers equalling or exceeding the 1% population threshold for a Primary Roost include Shoveler, Grey Plover, Lapwing, Dunlin, Knot and Turnstone.

15413 Severn - Hills Flats - Uncounted Sector

General Description

- 5.314. This Sector consists of a long and relatively homogenous tract of foreshore between the north end of Oldbury Power Station lagoon and Severn House Farm. The main habitat available is saltmarsh, with a large pill mouth midway along and hard sea defences at the north end. The saltmarsh narrows considerably here and is absent along much of the sea wall.

Roosting birds

- 5.315. Within this Sector, eight roosts of significant Interest Species assemblages were identified. These are listed in Table 5.82 below.
- 5.316. Roosting wildfowl and waders were distributed along the shore line of this sector in diffuse groups that made mapping problematic. Some of the larger polygons depicting roosts on open water are for low numbers of birds. The main interest of the Sector was for Wigeon and Snipe, but roosting Ringed Plover were also found. This is a species that was very seldom encountered during the primary surveys in 2016-17. The restless behaviour of other wader species such as Redshank and Turnstone was notable, with some groups not settling for any length of time.
- 5.317. Large numbers of black-headed and Common Gulls were noted drifting upstream on the incoming tide within this Sector. These flocks were considered too ephemeral to warrant mapping.

Table 5.82: Roost sites in Sector 15413 – Hills Flats

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
1	Severn House Farm	ST6421298348	Waders	Rock outcrop	No
2		ST6388798244	Waders	Artificial structure	No
3		ST6298497612	Mixed	Saltmarsh	Yes
4		ST6269197542	Wildfowl	Open water	Possible
5		ST6247397252	Wildfowl and waders	Saltmarsh	No
6		ST6153296580	Wildfowl waders and gulls	Saltmarsh	Possible
7		ST6146996647	Wildfowl	Mudflats and open water	No

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
8		ST6122496244	Wildfowl	Mudflats and open water	

Roost 1 – Severn House Farm

- 5.318. This rock outcrop at the base of the hard sea defences was host to a small number of waders on three surveys. It was a non-Primary Roost for the two Interest Species present but is included here because it had the potential to be used more frequently than was apparently the case in 2016-17.

Table 5.83: Species assemblage at Roost 15413 - 1, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Dunlin	Y	Y	Y	0-25	14	No	
Common Sandpiper				0-1	14	-	
Redshank	Y	Y	Y	0-5	29	No	

- 5.319. This roost was subject to periodic disturbance from users of the footpath at the top of the sea wall. All birds flushed upstream when approached.

Roost 2

- 5.320. This roost at the base of the hard sea defences was host to a small number of waders on two surveys. Although Ringed Plover only occurred here once, the number of birds was greater than the 1% SPA population threshold for a Primary Roost so the site qualified as a Possible Primary Roost.

Table 5.84: Species assemblage at Roost 15413 - 2, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Ringed Plover		Y*	Y	0-15	14	Possible	
Redshank	Y	Y	Y	0-5	14	No	

* 1993 SPA citation species

- 5.321. This roost was also subject to periodic disturbance from users of the footpath at the top of the sea wall. All birds flushed upstream when approached.

Roost 3

- 5.322. This area is a long band of saltmarsh between the flood bank and the estuary. With the exception of a small area at ST6311697742, where a concentration of birds (mainly Snipe and Redshank) was found, this contained a scattering of wildfowl and waders in no obvious pattern of occupancy. Snipe occurred in numbers and frequency sufficient for the area to qualify as a Primary Roost, with counts between 13 and 46.

Table 5.85: Species assemblage at Roost 15413 - 3, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Wigeon		Y	Y	0-3	14	No	
Teal		Y		0-1	14	No	
Mallard		Y		0-2	29	No	
Grey Heron				0-7	43	-	
Golden Plover				0-24	14	No	
Dunlin	Y	Y	Y	0-5	29	No	
Snipe			Y	0-46	57	Yes	
Redshank	Y	Y	Y	0-24	71	No	

- 5.323. Almost all Snipe seen were flushed by the surveyor, who walked along the footpath on the top of the flood bank. This gave an indication of the effect of walkers on roosting/ feeding birds.
- 5.324. In December, two wildfowlers were noted stationed behind a temporary camouflage screen on the edge of the saltmarsh at the south end of this area. How often wildfowlers use the area was not certain, but this clearly would be a source of disturbance whenever they are present.

Roost 4

- 5.325. This very large area encompasses open water that was largely occupied by roosting Wigeon, which occurred in sufficient number and frequency to qualify the area as a Possible Primary Roost. The area included the mouth of Hill Pill (at ST625973), where some birds accumulated in the slack water there. Most birds, however, attempted to roost at the water's edge by the saltmarsh but were invariably flushed out to open water on the estuary by the passage of the surveyor. Presumably, the concentration of wildfowl in this area at times of no disturbance was the reason for the wildfowlers observed on Roost 3 being present on the foreshore.

Table 5.86: Species assemblage at Roost 15413 - 4, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-3	14	No	
Wigeon		Y	Y	0-144	86	Possible	
Teal		Y		0-17	71	No	
Mallard		Y		0-4	43	No	

Roost 5

- 5.326. This is another large area of saltmarsh to the south-west of the mouth of Hill Pill. Birds were found scattered along it in various locations through the surveys. None of the Interest Species present were there in sufficient number or frequency to qualify the site as a Primary Roost so it was classified as a non-Primary Roost.

Table 5.87: Species assemblage at Roost 15413 - 5, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Wigeon		Y	Y	0-4	14	No	
Mallard		Y		0-12	14	No	
Oystercatcher				0-8	14	-	
Dunlin	Y	Y	Y	0-3	29	No	
Snipe			Y	0-1	43	No	
Redshank	Y	Y	Y	0-34	71	No	

5.327. Disturbance issues caused by the footpath on the flood bank were as for the upstream roosts.

Roost 6

5.328. This is another large area of saltmarsh between Chapel House and White House. Birds were found scattered along it in various locations through the surveys. Turnstone were recorded twice in numbers above the 1% SPA population threshold to qualify the site as a Possible Primary Roost.

Table 5.88: Species assemblage at Roost 15413 - 6, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Wigeon		Y	Y	0-33	29	No	
Oystercatcher				0-11	29	-	
Dunlin	Y	Y	Y	0-61	43	No	
Curlew		Y	Y	0-2	71	No	
Redshank	Y	Y	Y	0-6	29	No	
Turnstone			Y	0-35	29	Possible	
Black-headed Gull				0-80	14	-	

5.329. Disturbance issues caused by the footpath on the flood bank were as for the upstream roosts.

Roost 7

5.330. This roost covered an area of intertidal mud and open water where Wigeon and Mallard appeared to congregate in a loose group. Neither species occurred in high enough numbers to qualify the area as more than a non-Primary Roost. Larger numbers were found a short distance downstream of this location on the shore of Oldbury Power Station lagoon.

Table 5.89: Species assemblage at Roost 15413 - 7, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Wigeon		Y	Y	0-45	86	No	
Mallard		Y		0-9	29	No	

5.331. Disturbance of these birds was noted from river traffic and walkers, with birds displaced short distances upstream and downstream.

Roost 8

5.332. This roost covered an area of intertidal mud and open water where Wigeon, Teal and Mallard appeared to congregate in another loose group. None of these species occurred in high enough numbers to qualify the area as a Primary Roost but numbers of Mallard did come very close to meeting the 1% SPA population threshold for this species, so the area was classified as a Possible Primary Roost. Larger numbers of all of these species were found a short distance downstream of this location on the shore of Oldbury Power Station lagoon.

Table 5.90: Species assemblage at Roost 15413 - 8, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Wigeon		Y	Y	0-45	86	No	
Teal		Y		0-11	14	No	
Mallard		Y		0-27	57	Possible	

5.333. Disturbance of these birds was noted from river traffic and walkers, with birds displaced short distances upstream and downstream.

14455 River Severn at Oldbury - Counted Sector

General Description

5.334. This Sector covers an area along the river frontage between the north end of the old Oldbury Power Station tidal lagoon and Oldbury Pill to the south. It is counted by Andy Middleton, a volunteer surveyor. Inland areas between Oldbury Pill and the power station grounds are not officially part of the WeBS Sector but are counted anyway. Inland areas that are officially part of the Sector include the power station grounds landward of the sea wall and fields north of this. These areas are mainly composed of a mixture of arable and improved pasture.

5.335. Three lagoons within the power station ownership that were constructed in the late 1970s have been of major significance to roosting and breeding waders as well as wintering wildfowl when they were operational, and for some years afterwards, but each one has progressively become less attractive to these species, to the point where they are no longer used by the majority of Interest Species.

Roosting birds

5.336. The interview and site visit with Andy Middleton took place on 12th February 2017. Within this Sector, nine roosts of significant Interest Species assemblages were identified. One of these was counted on an additional survey in January by the surveyor covering Sector 15413, Hills Flats. The roosts are listed in Table 5.91 below.

Table 5.91: Roost sites in Sector 14455 - Oldbury

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
1	The Ledges Buoy	ST6001695787	Wader	A green marker buoy on the edge of the tidal lagoon	Yes
2	North end of the tidal lagoon	ST6085795655	Wildfowl and waders	Intertidal mud and beds of seaweed on boulders.	Possible
3		ST6108195601	Waders	Improved pasture	Yes
4	Lagoon 1	ST6086895189	Wildfowl and waders	Improved pasture over mud pumped out from the tidal lagoon	Historic
5	Sea wall	ST6064395180	Waders	Hard sea defences	Yes (passage)
6	Lagoon 2	ST6085994785	Waders	Scrub and small wetland area over mud pumped out from the tidal lagoon	Historic
7	Lagoon 3	ST6052493983	Wildfowl waders and gulls	Reedbed over mud pumped out from the tidal lagoon	Yes/ Historic
8		ST6042493343	Waders	Arable fields	Possible
9	Cowhill Warth	ST5990792686	Wildfowl and waders	Saltmarsh	Yes

Roost 1 – The Ledges Buoy

- 5.337. This is a marker buoy on the north side of the power station tidal lagoon. It is approximately 950m from the shore line so is relatively difficult to count due to this distance. Typical high tide numbers of Turnstone exceed the 1% SPA population threshold for this species so it has been classified as a Primary Roost. It is occupied during passage periods and all winter.

Table 5.92: Species assemblage at Roost 14455 – 1 Oldbury, based on the counter interview

Species	Status			Number of birds*	% presence at roost site	Count during site visit	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI					
Turnstone			Y	25 (60)	75	25	Yes	

* Numbers given are typical counts at high tide. Numbers in brackets are peak counts at high tide

- 5.338. There has been no noticeable disturbance of this roost.

Roost 2 – the North end of the tidal lagoon

- 5.339. This roost is located on an expanse of habitats including open water, tidal mud, boulder and shingle shore (for the most part covered in seaweed) and saltmarsh. It is completely covered at high tide as the water level rises, but it is occupied for some time before high tide and the foreshore is available to roosting birds on neap tides.
- 5.340. A number of Interest Species have been recorded in this area, with Wigeon and Snipe occurring in sufficient number and sufficiently frequently to qualify it as a Primary Roost for these species. In addition, it is used by large numbers of Dunlin on autumn passage, although these birds tend to

vacate the area to roost further downstream at Roosts 8 or 9 when the mudflats are completely covered.

Table 5.93: Species assemblage at Roost 14455 - 2, based on the counter interview

Species	Status			Number of birds*	% presence at roost site	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		10 (30)	75	No	No count here on 12/02/17
Wigeon		Y	Y	200 (250)	75	Yes	
Teal		Y		50 (250)	50	No	
Lapwing		Y		25 (50)	50	No	
Sanderling				1 (1)	1-5	-	
Little Stint				1 (1)	1-5	-	
Dunlin	Y	Y	Y	300 (600)	15-20	No	Peak counts on autumn passage
Snipe			Y	10 (20)	50	Yes	
Redshank	Y	Y	Y	10 (20)	75	No	

* Numbers given are typical counts at high tide. Numbers in brackets are peak counts at high tide

Table 5.94: Species assemblage at Roost 14455 -2, based on one count in January 2017

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Wigeon		Y	Y	282	N/A	Possible	
Teal		Y		201	N/A	Possible	
Mallard		Y		10	N/A	No	
Lapwing		Y		21	N/A	No	
Curlew		Y	Y	32	N/A	No	
Snipe			Y	2	N/A	No	
Common Gull				6	N/A	-	

- 5.341. This roost is near to the footpath on the sea wall and is likely to be flushed whenever people pass by. This is a fairly isolated area but there is parking very close to the sea wall further upstream, so disturbance could be regular.

Roost 3

- 5.342. This is an area of improved pasture inland from the sea wall where Curlew go to feed over the high tide. Lapwing are also occasional. On the basis of information from the counter, this was considered likely to be a Primary Roost for Curlew.

Table 5.95: Species assemblage at Roost 14455 - 3, based on the counter interview

Species	Status			Number of birds*	% presence at roost site	Count during site visit	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI					
Curlew		Y	Y	50 (50)	100	35	Yes	
Lapwing		Y		20 40	10	0	No	

*Numbers given are typical counts at high tide. Numbers in brackets are peak counts at high tide

5.343. This area is relatively undisturbed, although it is quite close to the footpath on the sea wall.

Roost 4 – Lagoon 1

5.344. This is an improved grassland field sown in the 1980s over mud that had been pumped in from the tidal lagoon on the estuary. Lagoon 1 has attracted large numbers of wildfowl in the past, including regular numbers of Wigeon exceeding 300-350 birds in winter (Middleton 2006). The area has declined in recent years because of reduced flooding. The formerly large pool that formed in the lagoon has been dry for the last five years and there are now very few birds present. The site is now considered to be a Historic Primary Roost.

Table 5.96: Species assemblage at Roost 14455 - 4, based on the counter interview

Species	Status			Number of birds*	% presence at roost site	Count during site visit	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI					
Wigeon		Y	Y	300 (400)	100	0	Historic	
Teal		Y		300 (400)	100	0	Historic	
Lapwing		Y		10 (10)	75	0	No	
Redshank	Y	Y	Y	40 (50)	75	0	Historic	

*Numbers given are typical counts at high tide. Numbers in brackets are peak counts at high tide

5.345. No major disturbance events have been recorded at this location.

Roost 5 – the sea wall adjacent to Lagoon 1

5.346. This is a length of the hard sea defences that run along the estuary frontage of the power station as far as the north end of Lagoon 1. It was identified as a roost, predominantly on autumn passage, for Ringed Plover, Dunlin and a number of other seldom-occurring species of wader including sanderling and little stint. Numbers of Ringed Plover occurring there suggest that it is Possible Primary Roost.

Table 5.97: Species assemblage at Roost 14455 - 5 based on the counter interview

Species	Status			Number of birds*	% presence at roost site	Count during site visit	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI					
Ringed Plover			Y	30 (30)	50	0	Possible	
Dunlin	Y	Y	Y	150 (150)	50	0	No	
Sanderling				4 (5)	10	0	-	
Little Stint				1 (5)	5	0	-	

*Numbers given are typical counts at high tide. Numbers in brackets are peak counts at high tide

- 5.347. Any birds roosting on the sea wall in this area are likely to be flushed if walkers are present on the footpath. This may happen frequently.

Roost 6 – Lagoon 2

- 5.348. This lagoon was bare mud when operational, but it was closed in 1994 and has progressively scrubbed over, with a small wetland area surrounded by reeds persisting at its south end. In its heyday, the site attracted large numbers of waders. Having now been abandoned, it was classified as a Historic Primary Roost.

Table 5.98: Species assemblage at Roost 14455 - 6, based on the counter interview

Species	Status			Number of birds*	% presence at roost site	Count during site visit	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI					
Lapwing		Y		1500 (1500)	100	0	Historic	
Dunlin	Y	Y	Y	1000 (1000)	100	0	Historic	
Curlew		Y	Y	1000 (1000)	100	0	Historic	

*Numbers given are typical counts at high tide. Numbers in brackets are peak counts at high tide

- 5.349. The roost always suffered from some degree of disturbance due to employees of the power station going for walks around the lagoon at lunch time. Although this still occurs, as well as there being other recreational visitors, there are now no impacts because there are no roosting birds.

Roost 7 – Lagoon 3

- 5.350. Lagoon 3 was opened in 1994 and for some years it was host to very large numbers of wading birds, with wildfowl and gulls. In the last few years, since mud pumping ceased, the lagoon has changed in character to a reedbed. The only waders present now are Snipe and Jack Snipe.

Table 5.99: Species assemblage at Roost 14455 - 7, based on the counter interview

Species	Status			Number of birds*	% presence at roost site	Count during site visit	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI					
Wigeon		Y	Y	30 (30)	100	0	Historic	
Teal		Y		20 (20)	100	0	Historic	
Mallard		Y		30 (30)	100	0	Historic	
Lapwing		Y		1000 (1000)	100	0	Historic	
Dunlin	Y	Y	Y	2000 (2000)	100	0	Historic	
Jack Snipe				5 (5)	100	1	-	
Snipe			Y	60 (60)	100	52	Yes	
Curlew		Y	Y	2000 (2000)	100	0	Historic	
Black-headed Gull				1500 (1500)	100	0	-	
Mediterranean Gull				1 (2)	5	0	Historic	
Lesser Black-backed Gull				10 (20)	50	0	Historic	
Herring Gull				10 (20)	50	0	Historic	

Great Black-backed Gull				3-4 (30)	50	0	Historic	
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*Numbers given are typical counts at high tide. Numbers in brackets are peak counts at high tide

- 5.351. As for Lagoon 2, the roost always suffered from some degree of disturbance due to employees of the power station going for walks around the lagoon at lunch time. Although this still occurs, as well as there being other recreational visitors, there are few disturbance impacts because the roosting birds present (Snipe) are for the most part not affected.

Roost 8

- 5.352. This is a feeding area for Lapwing, Dunlin and Curlew and is made up of arable fields usually put down to maize. Birds come in to feed around the stubble when the fields are wet. On the basis of the numbers discussed, the area is a Possible Primary Roost for Curlew.

Table 5.100: Species assemblage at Roost 14455 - 8, based on the counter interview

Species	Status			Number of birds*	% presence at roost site	Count during site visit	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI					
Lapwing		Y		50 (50)	50	50	No	
Dunlin	Y	Y	Y	150 (150)	50	150	No	
Curlew		Y	Y	60 (60)	50	60	Possible	

*Numbers given are typical counts at high tide. Numbers in brackets are peak counts at high tide

- 5.353. There has been no noticeable disturbance of this area.

Roost 9 – Cowhill Warth

- 5.354. This is an area of saltmarsh to the south of Oldbury Pill mouth. It is only partially within the official WeBS counting sector but it is considered in its entirety here. The Warth can be host to large numbers of feeding and roosting wildfowl and waders. On the basis of the information from the counter, the area qualifies as a Primary Roost for Lapwing, Dunlin and Curlew. Counts by John Sanders in 2016-17 confirm this, although the main roost in his experience is slightly south of the Warth, in an area that is not part of either this sector or the adjacent one at 14454 (Littleton Warth).

Table 5.101: Species assemblage at Roost 14455 - 9, based on the counter interview

Species	Status			Number of birds*	% presence at roost site	Count during site visit	SPA Primary Roost?	Comments
	SPA QS	SPA QA	SSSI					
Wigeon		Y	Y	60 (60)	100	0	No	
Lapwing		Y		700 (700)	100	700	Yes	
Dunlin	Y	Y	Y	150 (1500) 0	100	1500	Yes	
Curlew		Y	Y	160 (160)	100	160	Yes	
Redshank	Y	Y	Y	35 (35)	100	0	No	

*Numbers given are typical counts at high tide. Numbers in brackets are peak counts at high tide

- 5.355. Cowhill Warth, along with areas to the south, is subject to repeated disturbance, largely from walkers and dogs. The effect of such disturbance is to displace birds from one roost to another, to

inland sites nearby or across the estuary to roosting sites between Aylburton and Wibdon Wharf²³. Birds are known to move between this and Littleton Warth as well as to fields inland of the sea wall.

15407 Severn - Beachley to Pillhouse Rocks – Uncounted Sector

General Description

- 5.356. This Sector takes in a number of different habitats along its 5.6km length, with saltmarsh, rock outcrops and three pills. High ground plunges abruptly to the estuary along much of its length, notably at Sedbury Cliffs and Beachley. This Sector was covered by two surveyors to ensure it was counted effectively within the time available.

Roosting birds

- 5.357. Within this Sector, three roosts of significant Interest Species assemblages were identified. These are listed in Table 5.102 below.

Table 5.102: Roost sites in Sector 15407 – Beachley to Pillhouse Rocks

Roost no.	Roost Site Name	Grid ref. (site centroid)	Roost Type	Description	SPA Primary Roost?
1	Pillhouse Rocks and Sturch Pill	ST5676894987	Wildfowl and waders	Rock outcrop, saltmarsh and slack open water between	Yes
2	Slimeroad Pill	ST5518892510		Saltmarsh	
3	Chapel Rock	ST5483890024		Rock outcrop with small areas of saltmarsh and exposed mud.	

Roost 1 - Pillhouse Rocks and Sturch Pill

- 5.358. This area encompasses the exposed (but seaweed-covered) rock outcrop at Pillhouse Rocks, the adjacent Sturch Pill mouth and adjoining saltmarsh. Snipe were present on all surveys and occurred in numbers above the 1% SPA population threshold for this species each time. This qualified the site (specifically, the rocks and saltmarsh immediately next to the rocks) as a Primary Roost for Snipe.
- 5.359. Wigeon numbers exceeded the 1% SPA population threshold once, making the site a Possible Primary Roost for this species.

Table 5.103: Species assemblage at Roost 15407 - 1 based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-4	29	No	
Wigeon		Y	Y	0-85	71	Possible	
Teal		Y		0-15	71	No	

²³ John Sanders, personal communication.

Mallard		Y		0-10	29	No	
Lapwing		Y		0-25	57	No	
Dunlin	Y	Y	Y	0-32	29	No	
Snipe			Y	4-54	100	Yes	
Redshank	Y	Y	Y	0-3	29	No	

5.360. This area is very isolated as there is no public access to it. The owner and neighbours sometimes walk their dogs to the Rocks but otherwise the roost is undisturbed.

Roost 2 - Slimeroad Pill and associated saltmarsh

5.361. This covers an area of saltmarsh, some reedbed, muddy foreshore and the Pill mouth. It is bounded by high ground and is overlooked by gardens to houses at the south end, with pastoral farmland on hillsides at the north end.

5.362. Numbers of Snipe were consistently above the 1% SPA population threshold so the site qualified as a Primary Roost for this species.

Table 5.104: Species assemblage at Roost 15407 - 2, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Shelduck	Y	Y		0-4	29	No	
Wigeon		Y	Y	0-26	29	No	
Teal		Y		0-6	14	No	
Mallard		Y		0-5	29	No	
Dunlin	Y	Y	Y	0-1	14	No	
Jack Snipe				0-2	14	-	
Snipe			Y	0-8	71	Yes	
Curlew		Y	Y	0-1	14	No	
Common Sandpiper				0-1	57	-	
Redshank	Y	Y	Y	0-26	29	No	

5.363. The saltmarsh here is clearly used by people, with tracks across it, as well as an official footpath running along the west side. However, no disturbance events were noted during surveys other than the effect of the surveyor himself, and disturbance was considered unlikely to be a serious problem for birds roosting in this area.

Roost 3 - Chapel Rock

5.364. This is a rock outcrop at the end of Beachley Point. It is officially in the adjacent Sector 60426, Mathern. However, it was counted as part of this work because it is so close to Sector 15407 and it was one of only a few locations with roosting birds in, or next to it.

5.365. Whimbrel were counted on one survey only, with the two birds present representing 1% of the SPA population threshold for a Primary Roost. Ordinarily this would only qualify the site as a Possible Primary Roost. However, a number of reports from observers through the winter of 2016-17 showed that these birds were regularly found there²⁴, so the Primary Roost criteria were

²⁴ See <https://theglosterbirder.co.uk/2017/02/01/wednesday-1st-february-2017/> for instance.

considered to have been met, at least in the study period. Over-wintering Whimbrel are unusual in the UK, with the main wintering area for birds passing through this country being in West Africa (Trolliet 2006). Two Whimbrel have also been recorded at Chapel Rock in the previous winter of 2015-16.

- 5.366. GDS records suggest that Curlew, Dunlin and Redshank numbers observed in 2016-17 are representative of the normal roosting assemblage at Chapel Rock. Other waders recorded previously include low numbers of Snipe and Turnstone.
- 5.367. Notable counts of other species at Chapel Rock/ Beachley that were reported to the GDS include a count of 137 Wigeon that exceeded the 1% SPA population threshold for a Primary Roost. This suggests that the roost is seldom occupied by this species. An incidental count of Wigeon further out into the estuary outside of the counting Sector (between Aust Rock and the Welsh side of the mouth of the River Wye), in November 2016, was estimated to be around 1000 birds on the open water. This suggested that the wider area may have some great significance for this species and roost sites such as Chapel Rock could be used intermittently by a proportion of such numbers.

Table 5.105: Species assemblage at Roost 15407 – 3, based on counts during winter 2016/17

Species	Status			Number of birds	% presence at roost site	Primary Roost?	Comments
	SPA QS	SPA QA	SSSI				
Mallard		Y		0-6	29	No	
Grey Heron				0-1	14	-	
Oystercatcher				0-7	57	-	
Lapwing		Y		0-82	14	No	
Dunlin	Y	Y	Y	0-102	43	No	
Whimbrel		Y	Y	0-2	14	Yes*	
Curlew		Y	Y	0-3	57	No	
Redshank	Y	Y	Y	0-8	29	No	

* see explanation in text above

- 5.368. This site was not subject to any kind of disturbance. At low tide it may be accessible to people but this would be a treacherous crossing from the Point so it was not thought likely that anyone would attempt this with any regularity.

6.0 Discussion

- 6.1. Using the criteria set out by Woodward *et. al.* (2016), as well as detailed consultation with WeBS counters covering three of the 16 Sectors within the study area, the number of Primary Roosts in the study area has been found to be 30. Fifteen of these are at WWT Slimbridge or on the estuary in close proximity to it. The importance of the reserve is clear, particularly for the species which do not occur regularly elsewhere within the study area of the SPA, namely Bewick's Swan, White-fronted Goose, Tufted Duck and Pochard.
- 6.2. It is likely that the single most important factor influencing the importance of WWT Slimbridge is that the site is protected from disturbance, unlike any other part of the estuary under consideration.
- 6.3. The importance of roosts outside of protected areas for certain species, principally Curlew, cannot be emphasised enough. Although Aylburton Warth only met criteria for a Possible Primary Roost using the data generated in 2016-17, desk study data and the studies by John Sanders clearly show that it should be classified as a Primary Roost. This, along with Guscar Rocks and Cow Pill Warth, are probably the most important roosts in the study area outside of WWT Slimbridge, and it is likely that their degradation or loss would impact hugely on the populations of the species that occupy them. Disturbance at these sites, and at many others, is clearly a major issue, with regular and irregular sources including walkers, dogs, unauthorised wildfowlers and unauthorised mooring of boats. These two latter issues were encountered at Aylburton Warth and Guscar, whilst at Cow Pill Warth, boat movements must be very regular with the site being so close to Thornbury Sailing Club.
- 6.4. Other Primary Roosts in the study area are clearly extremely important as part of a network of sites available at certain times of the year. For instance, Curlew and a suite of wildfowl species appear to favour Saul Warth and other areas of the Frampton Realignment, particularly during late winter, spring and autumn. It is likely that a number of the 38 Possible Primary Roosts could have equal importance to the confirmed Primary Roosts as part of this network but this importance could not be confirmed from the evidence available. Notable examples of this are the suite of Curlew feeding areas in the Longney Sands Sector and on the right bank of the New Grounds Sector (possibly more accurately described as being within Awre parish). Apparent movements of birds across the Arlingham peninsula between Longney/ Rodley and Frampton/ Awre sites have been observed frequently and it has been speculated that at times the entire Curlew wintering flock upstream of Sharpness is in one location, or commuting frequently between them²⁵.
- 6.5. It is clear from the analysis of data and discussion with WeBS counters and other observers that wetland bird roosts on the Severn Estuary within the study area can be highly mobile, with occupancy of them dependent on a number of factors. This suggests that the Primary Roost criteria may be too inflexible a measure of the importance of roost sites, as is indicated by analysis of data from WWT Slimbridge. They also do not effectively identify Primary Roosts during spring and autumn passage for un-counted Sectors. Conversely, the criteria may over-emphasise the importance of roosts for Snipe, but this is largely because this species is generally under-

²⁵ Mike Smart and John Sanders, personal communication

recorded wherever it occurs due to its skulking nature. A 1% population threshold of two birds is clearly a reflection of how under-recorded the species is during normal WeBS counting surveys.

- 6.6. Sites in close proximity to the SPA which were not part of this study regularly hold significant numbers of wildfowl and may account for the lack of certain species within the study area. For instance, lakes at Frampton on Severn regularly have large wintering populations of Tufted Duck and Pochard, both species that were recorded in only two locations within the Sectors studied (New Grounds, Slimbridge and Lydney Harbour Pools). Such sites may be host to a significant proportion of the wintering populations that led to their original inclusion in the SPA Qualifying Assemblage. At the very least, sites like Frampton Court Lake and Townfield Lake should be considered to be Functionally Linked to the SPA.
- 6.7. Land use change within areas of interest for certain species could impact both positively and negatively. Clearly, the managed realignment at Aylburton Warth has benefitted a number of species by creating saltmarsh and other intertidal habitats. How long these benefits will be felt depends on the extent of erosion that is on-going and sometimes dramatic in extent. Accretion elsewhere, such as the area of saltmarsh adjacent to the Dumbles in the New Grounds sector, could lead to significant increases in the availability of roosting sites that are not regularly disturbed. However, if the assertion is true that wintering populations of certain species, most notably Curlew, are separate between those upstream and downstream of Sharpness, selection and protection of habitat suitable for roosting in these two areas needs to take this into account.
- 6.8. The abandonment of mud pumping from the tidal lagoon in the estuary into Oldbury Power Station Lagoons 1-3, may represent the single most dramatic loss of roosting sites in the last 20 years, as is evidenced by comments from Andy Middleton and John Sanders. These areas were relatively un-disturbed compared to the sites that are currently used and that are clearly under pressure from a number of sources of disturbance.
- 6.9. Replacement of pasture with maize production, which was noted by surveyors, who already had some years' experience of the Sectors they were surveying, could impact negatively on roosting and feeding birds because the height of the crop is too tall for much of the growing season and into the autumn but also because applications of insecticides will reduce the number of invertebrates available in the soils and stubbles that are available over winter.

7.0 Recommendations

- 7.1. Protection of Primary Roosts and a number of Possible Primary Roosts that could be more significant than the survey data suggested should be a priority in any conservation program for the Severn Estuary within, and beyond, the study area. Such protection could take several different forms including direct approaches to landowners, diversion or screening or footpaths, effective signage and, in some cases, wardening. Approaches should also be made to estuary users who may not know of the impact their activities are having on roosting birds within the SPA. Particularly important target audiences include dog walkers, recreational boaters, wildfowlers and owners of light aircraft. Locations with particular problems of disturbance that could benefit from targeted action include the key sites of Aylburton Warth, Guscar and Cow Pill Warth. There is clear interchange of birds between these sites and Wibdon Wharf, which may act as a refuge area when all of the other three sites suffer disturbance at the same time. Various approaches to interest groups on the estuary have already been made by WWT in relation to disturbance of the estuary and the reserve at Slimbridge and these could be built upon to better effect across the SPA.
- 7.2. Given that Aylburton Warth is in the ownership of the Environment Agency, full advantage should be taken of the opportunities to enhance and protect it to ensure that this becomes a significant nature conservation area for many years to come. One mechanism for achieving this may be to designate it as a formal nature reserve.
- 7.3. Effective protection of Guscar and Aylburton from disturbance should be a priority, as this site is regularly host to almost the entire population of Curlew on the Severn south of Sharpness. This site appears to suffer the most regular disturbance of all the Primary Roosts identified. With the site not on or near to an official right of way, it is likely that a small number of people are responsible for the regular disturbance and individual approaches to them could therefore be very effective. Clearly, close liaison and co-operation with the land owner is equally important and should be the first action under any such strategy.
- 7.4. Enhancement of sites currently, historically or potentially host to large numbers of roosting or feeding birds at high tide could be considered. Agricultural land along the Severn would benefit from a targeted scheme for land management and capital works in the post-Brexit era, with schemes such as the reedbed enhancement on Frampton Court Estate, as well as the wetland creation instigated by GWA at Brims Pill, being good examples of what can be achieved. The potentially vital importance of certain now-rare habitats such as the unimproved grassland areas at Lower Dumball and Whitescourt must be emphasised and reflected in conservation advice to farmers and landowners.
- 7.5. Given their historic importance, up to only a few years ago in one case, the reinstatement of habitat favourable to roosting wetland birds at the Lagoons at Oldbury Power Station should be considered as a priority. Numbers of Curlew are considered to have halved in the lower Severn area between Lydney Sand and the Severn bridges in the last 20 years, from around 1,800 birds to between 800 and 900, with reasons for the decline thought likely to be due to loss of secure roosting areas²⁶. Reinstatement of Oldbury Lagoons could help to reverse this decline. It is

²⁶ John Sanders, personal communication.

understood that representatives of various stakeholders for Lagoon 3 are in active dialogue to achieve this. One of the major advantages of the site is that it has the potential to provide (again) a refuge area for birds that currently use roosts that are subject to potentially very damaging episodes of disturbance.

- 7.6. Further work on the importance of roosts along the Severn Estuary within the study area and beyond could include periodic re-survey to determine any changes in roost status, land use and erosion/ accretion of habitat favourable to use by roosting birds. It should be noted that, in recognition of the findings of this survey in 2016/17, measures have been taken in 2017/18 to improve WeBS count coverage by increasing the number of counted sites. Aylburton/ Guscar is now being regularly counted, as are Sharpness and Berkeley Pill, and a number of existing sites have been redefined to make counting easier (thus the two halves of the Sharpness site have been made into separate sites, and Berkeley Pill has been made into a separate site from Berkeley Shore; in all cases it will still be possible to compare any new data with old data.
- 7.7. The geographic extent of a re-survey could include Phases 1-3, although this would require a very significant and co-ordinated effort to achieve within a short time frame each month if qualitative data such as movements of birds between sectors is to be identified. A more manageable and ecologically relevant approach should be the inclusion of sectors as far downstream as the second Severn Crossing. This may provide more information on the interchange of birds between these sectors and those that have been included in the current Phase of the project. The importance of Littleton Warth (in Sector 14454, which was subject to study under Phase 2 of the project, see Woodward *et. al.* 2016) to birds found feeding between at least Shepperdine Sands and the Severn crossings has been identified and highlighted by the studies conducted by John Sanders. Capture of further information on bird movements and inter-connectivity of roosting sites in the area near to the bridges should be investigated further if effective conservation of the populations here is to be put in place.
- 7.8. In addition to the above, greater emphasis could be placed on the identification and monitoring of Functionally Linked Land. Sites adjacent to the Phase 4 survey area could include (but not necessarily be restricted to) the following sites (in order from upstream to downstream):
 - Wilmer Common
 - Walmore Common
 - The Awre peninsula
 - The Frampton Estate lakes (Court Lake and Townfield Lake)
- 7.9. Inclusion, in any further work, of other actual or potential FLL sites further afield, may need to be determined by a wider consultation with local birdwatchers who regularly watch sites away from the estuary in Gloucestershire and South Gloucestershire, but also potentially in areas around Bristol and in Gwent.
- 7.10. To fully capture the importance of passage roosts, any further survey effort should include the entirety of the months determined by WeBS to include the spring (April to June), autumn (July to October) and winter (November to March) periods.
- 7.11. Any further field work should be informed by wider consultation and a review of all academic, consultancy and SNCO commissioned work.

8.0 Acknowledgements

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- 8.3. Work done by John Sanders is deserving of special mention, as this was an invaluable additional source of information and experience, which was freely given on a number of occasions.
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- 8.5. Desk study data was kindly supplied by Richard Baatsen on behalf of the Gloucestershire Ornithological Co-ordinating Committee (GoCC).

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Appendices

Appendix 1: Primary Survey dates, timings, tide height and weather

Survey no.	Sector	Date	start time	end time	Tide ht. (m)	Cloud (octas)		Wind dir and strength		Temp (°C)		Rain		Vis (km)	
						start	end	start	end	start	end	start	end	start	end
1	15203 Lydney Harbour	18/09/2016	08:50	09:25	9.9	7	3	none	None	15	18	none	none	3.0	3.0
	15401 Longney Sands	20/09/2016	10:05	12:15	9.7	6	7	light SW	light SW	17	17	none	none	3.0	3.0
	15403 Awre	21/09/2016	10:50	13:30	8.3	5	5	none	light SW	18	21	none	none	3.0	3.0
	15404 Aylburton Guscar	20/09/2016	10:00	12:00	9.7	8	8	light NE	light NE	16	16	none	none	2.0	2.0
	15405 Wibdon Wharf	20/09/2016	10:00	12:00	9.7	8	8	light NE	light NE	16	16	none	none	2.0	2.0
	15407 Beachley to Pillhouse Rocks	17/09/2016	07:30	09:50	9.6	0	0	light NW	light NW	12	12	none	none	4.0	4.0
	15408 Lydney Marsh	18/09/2016	09:30	10:50	9.9	7	3	none	None	15	18	none	none	3.0	3.0
	15409 Purton to Naas	19/09/2016	10:00	12:00	9.9	8	8	mod NW	mod NW	16	16	none	none	1.0	1.0
	15410 Sharpness	19/09/2016	10:00	12:00	9.9	8	8	mod NW	mod NW	16	16	none	none	1.0	1.0
	15411 Purton to Brims Pill	19/09/2016	10:00	12:00	9.9	8	8	mod NW	mod NW	16	16	none	none	1.0	1.0
	15412 Arlingham	18/09/2016	09:00	11:15	9.9	7	3	none	None	16	18	none	none	3.0	3.0
	15413 Hills Flats	16/09/2016	07:00	09:10	9.0	8	4	light SW	mod SW	16	16	none	none	4.0	4.0
	15414 Frampton	15/09/2016	06:45	09:30	8.2	8	8	none	None	17	17	none	none	0.5	1.0
	15414 Frampton	21/09/2016	09:50	12:00	8.3	5	5	none	light SW	18	21	none	none	3.0	3.0
	2	15203 Lydney Harbour	16/10/2016	09:35	09:50	9.9	8	2	Light S	Light S	11	11	heavy	none	1.5
15401 Longney Sands		18/10/2016	09:50	11:50	10.3	4	3	light NW	light NW	11	14	none	none	5.0	5.0
15403 Awre		20/10/2016	10:30	12:30	9.3	2	3	light E	light E	10	10	none	none	5.0	5.0
15404 Aylburton Guscar		16/10/2016	07:45	09:45	9.9	7	2	light SE	light SE	13	15	heavy	none	5.0	5.0
15405 Wibdon Wharf		16/10/2016	07:45	09:45	9.9	7	2	light SE	light SE	13	15	heavy	none	5.0	5.0
15407 Beachley to Pillhouse Rocks		19/10/2016	09:30	10:40	10.0	4	3	Light NW	Light NW	13	14	none	none	5.0	5.0
15408 Lydney Marsh		16/10/2016	08:00	09:28	9.9	8	2	Light S	Light S	11	11	heavy	none	1.5	4.0
15409 Purton to Naas		17/10/2016	08:30	10:30	10.2	5	4	Mod SW	Mod SW	10	13	none	none	3.0	3.0

Survey no.	Sector	Date	start time	end time	Tide ht. (m)	Cloud (octas)		Wind dir and strength		Temp (°C)		Rain		Vis (km)	
						start	end	start	end	start	end	start	end	start	end
2	15410 Sharpness	17/10/2016	08:30	10:30	10.2	5	4	Mod SW	Mod SW	10	13	none	none	3.0	3.0
	15411 Purton to Brims Pill	17/10/2016	08:30	10:30	10.2	5	4	Mod SW	Mod SW	10	13	none	none	3.0	3.0
	15412 Arlingham	18/10/2016	09:50	11:50	10.3	4	3	light NW	light NW	11	14	none	none	5.0	5.0
	15413 Hills Flats	15/10/2016	07:15	10:00	9.2	7	7	v. light E	SE	12	15	none	none	3.0	4.0
	15414 Frampton	20/10/2016	10:30	12:30	9.3	2	3	light E	light E	10	10	none	none	5.0	5.0
3	15203 Lydney Harbour	20/11/2016	12:20	12:50	7.6	8	8	light WNW	light WNW	6	6	none	none	5.0	5.0
	15401 Longney Sands	21/11/2016	12:00	14:15	6.6	8	8	light NE	strong NE	6	5	heavy	heavy	1.0	1.0
	15403 Awre	17/11/2016	08:00	10:00	10.0	7	4	Mod SW	Mod SW	8	8	light	none	1.5	3.0
	15404 Aylburton Guscar	20/11/2016	10:40	12:40	7.6	8	8	light WNW	light WNW	6	6	none	none	5.0	5.0
	15405 Wibdon Wharf	20/11/2016	10:50	12:45	7.6	8	8	light WNW	light WNW	6	6	none	none	5.0	5.0
	15407 Beachley to Pillhouse Rocks	22/11/2016	13:00	15:15	5.6	6	7	light NW	light NW	10	10	none	none	5.0	5.0
	15408 Lydney Marsh	20/11/2016	10:30	12:20	7.6	8	8	light WNW	light WNW	6	6	none	none	5.0	5.0
	15409 Purton to Naas	18/11/2016	09:30	11:30	9.4	5	5	light SW	light SW	3	5	none	none	5.0	5.0
	15410 Sharpness	18/11/2016	09:30	11:30	9.4	5	5	light SW	light SW	3	5	none	none	5.0	5.0
	15411 Purton to Brims Pill	18/11/2016	09:10	11:30	9.4	5	5	light SW	light SW	3	5	none	none	5.0	5.0
	15412 Arlingham	21/11/2016	12:00	14:15	6.6	8	8	light NE	strong NE	6	5	heavy	heavy	1.0	1.0
	15413 Hills Flats	19/11/2016	10:00	12:00	8.6	7	7	light SW	light SW	3	3	showers	none	3.0	3.0
	15414 Frampton	17/11/2016	08:00	10:00	10.0	7	4	Mod SW	Mod SW	8	8	light	none	1.5	3.0
	4	15203 Lydney Harbour	18/12/2016	08:45	09:05	8.9	8	8	light SW	light SW	3	3	none	none	0.5
15401 Longney Sands		16/12/2016	08:00	10:00	10.0	1	8	none	None	6	10	none	none	0.5	3.0
15403 Awre		15/12/2016	07:45	12:00	10.1	8	4	light SE	light SE	9	11	none	none	5.0	5.0
15404 Aylburton Guscar		18/12/2016	08:25	11:00	8.9	8	8	light SW	light SW	3	3	none	none	0.5	2.0
15405 Wibdon Wharf		18/12/2016	08:45	10:45	8.9	8	8	light SW	light SW	3	3	none	none	0.5	2.0

Survey no.	Sector	Date	start time	end time	Tide ht. (m)	Cloud (octas)		Wind dir and strength		Temp (°C)		Rain		Vis (km)	
						start	end	start	end	start	end	start	end	start	end
4	15407 Beachley to Pillhouse Rocks	19/12/2016	08:50	11:00	8.1	8	8	light SE	light SE	8	8	none	none	2.0	1.5
	15408 Lydney Marsh	18/12/2016	09:15	11:15	8.9	8	8	light SW	light SW	3	3	none	none	0.5	2.0
	15409 Purton to Naas	17/12/2016	08:00	10:00	9.6	8	8	none	None	5	7	none	none	2.0	2.0
	15410 Sharpness	17/12/2016	08:00	10:00	9.6	8	8	none	None	5	7	none	none	2.0	2.0
	15411 Purton to Brims Pill	17/12/2016	08:00	10:00	9.6	8	8	none	None	5	7	none	none	2.0	2.0
	15412 Arlingham	16/12/2016	08:00	10:45	10.0	1	8	none	None	6	10	none	none	0.5	3.0
	15413 Hills Flats	18/12/2016	08:45	12:00	8.9	8	8	light SW	light SW	3	3	none	none	0.5	2.0
	15414 Frampton	15/12/2016	07:30	10:00	10.1	8	4	light SE	light SE	9	11	none	none	5.0	5.0
5	15203 Lydney Harbour	16/01/2017	08:25	08:40	9.0	8	8	light WNW	light WNW	8	9	light	none	2.0	2.0
	15401 Longney Sands	15/01/2017	08:20	11:00	9.5	8	8	mod W	light W	5	6	light	none	1.0	2.0
	15403 Awre	15/01/2017	08:35	10:25	9.5	8	8	mod W	light W	5	6	light	none	1.0	2.0
	15404 Aylburton Guscar	16/01/2017	08:10	10:40	9.0	8	8	light WNW	light WNW	8	9	light	none	2.0	2.0
	15405 Wibdon Wharf	16/01/2017	08:30	10:30	9.0	8	8	light WNW	light WNW	8	9	light	none	2.0	2.0
	15407 Beachley to Pillhouse Rocks	17/01/2017	08:15	12:30	8.3	8	8	v. light NW	v. light NW	6	6	none	mist	1.0	0.5
	15408 Lydney Marsh	16/01/2017	08:45	10:35	9.0	8	8	light WNW	light WNW	8	9	light	none	2.0	2.0
	15409 Purton to Naas	18/01/2017	09:35	11:30	7.5	8	8	v. light S	v. light S	5	5	none	none	2.0	3.0
	15410 Sharpness	18/01/2017	09:35	11:30	7.5	8	8	v. light S	v. light S	5	5	none	none	2.0	3.0
	15411 Purton to Brims Pill	15/01/2017	07:45	09:15	9.5	8	6	v. light W	v. light W	8	6	light	none	5.0	5.0
	15412 Arlingham	17/01/2017	09:40	12:15	8.3	8	8	v. light S	v. light S	5	6	none	none	1.0	2.0
	15413 Hills Flats	16/01/2017	08:00	10:30	9.0	8	8	light WNW	light WNW	8	9	light	none	2.0	2.0
15414 Frampton	19/01/2017	08:00	12:20	6.7	8	8	none	None	6	6	none	none	0.1	0.8	
6	15203 Lydney Harbour	12/02/2017	09:30	09:55	9.6	8	8	mod NE	mod NE	3	3	light	none	3.0	3.0
	15401 Longney Sands	13/02/2017	07:25	10:30	9.5	4	4	light NE	light NE	4	6	none	none	5.0	5.0
	15403 Awre	13/02/2017	07:40	10:00	9.5	2	2	mod NE	mod NE	4	6	none	none	2.0	3.0

Survey no.	Sector	Date	start time	end time	Tide ht. (m)	Cloud (octas)		Wind dir and strength		Temp (°C)		Rain		Vis (km)	
						start	end	start	end	start	end	start	end	start	end
6	15404 Aylburton Guscar	12/02/2017	07:20	09:20	9.6	8	8	mod NE	mod NE	3	3	light	none	3.0	3.0
	15405 Wibdon Wharf	12/02/2017	07:15	09:15	9.6	8	8	mod NE	mod NE	3	3	light	none	3.0	3.0
	15407 Beachley to Pillhouse Rocks	14/02/2017	07:30	10:00	9.1	8	8	mod E	mod E	4	4	none	none	2.0	2.0
	15408 Lydney Marsh	12/02/2017	07:10	10:10	9.6	8	8	mod NE	mod NE	3	3	light	none	3.0	3.0
	15409 Purton to Naas	15/02/2017	09:00	10:50	8.6	7	7	light SW	light SW	6	9	none	none	2.0	5.0
	15410 Sharpness	15/02/2017	09:00	10:50	8.6	7	7	light SW	light SW	6	9	none	none	2.0	5.0
	15411 Purton to Brims Pill	13/02/2017	07:00	08:30	9.5	6	7	mod NE	mod NE	4	6	none	none	2.0	3.0
	15412 Arlingham	14/02/2017	08:40	10:55	9.1	8	8	light NE	light NE	3	6	none	none	2.0	3.0
	15413 Hills Flats	12/02/2017	07:30	09:40	9.6	8	8	mod NE	mod NE	3	3	light	none	3.0	3.0
	15414 Frampton	16/02/2017	08:00	11:00	7.8	8	4	light SW	light SW	8	8	none	none	0.3	3.0
7	15203 Lydney Harbour	13/03/2017	08:30	08:45	9.4	2	1	none	light SW	5	5	none	none	3.0	3.0
	15401 Longney Sands	12/03/2017	06:15	09:15	9.1	8	8	light SW	light SW	6	8	none	none	2.0	4.0
	15403 Awre	12/03/2017	06:15	08:40	9.1	8	8	light SW	light SW	6	8	none	none	0.5	1.0
	15404 Aylburton Guscar	13/03/2017	06:35	09:10	9.4	2	1	none	light SW	3	5	none	none	3.0	3.0
	15405 Wibdon Wharf	13/03/2017	06:45	09:10	9.4	2	1	none	None	5	9	none	none	5.0	5.0
	15407 Beachley to Pillhouse Rocks	15/03/2017	07:55	10:50	8.9	8	8	none	None	6	6	none	none	1.0	2.0
	15408 Lydney Marsh	13/03/2017	06:30	08:25	9.4	2	1	none	light SW	3	5	none	none	3.0	3.0
	15409 Purton to Naas	14/03/2017	07:10	09:15	9.2	8	8	mod SW	mod SW	7	9	none	none	3.0	3.0
	15410 Sharpness	14/03/2017	07:10	09:15	9.2	8	8	mod SW	mod SW	7	9	none	none	3.0	3.0
	15411 Purton to Brims Pill	12/03/2017	06:30	08:30	9.1	8	8	v light SW	v light SW	9	9	none	none	0.5	3.0
	15412 Arlingham	15/03/2017	08:15	10:30	8.9	8	8	none	light SW	10	10	none	none	1.0	3.0
	15413 Hills Flats	13/03/2017	06:45	09:30	9.4	1	1	v light SW	v light SW	5	9	none	none	3.0	3.0
	15414 Frampton	17/03/2017	07:00	10:00	7.9	8	8	light SW	light SW	8	9	none	none	2.0	2.0

Appendix 2: Accounts of Interest Species from the Desk Study Results

Note: all records described below originate from the Gloucestershire [County Wetland Birds] Data Set (GDS). They have been interpreted and summarised by the current author without consultation with the original observers who submitted the data.

15401 Longney Sands – Uncounted Sector

Wildfowl

There are 11 records of Bewick's Swan within or adjacent to the Sector, with all counts of numbers equalling or exceeding the 1% SPA population threshold. Five of these counts refer to Upper Dumball or areas adjacent to it, with flocks of between eight and 40. The highest count of 48 birds is from Lower Dumball. Five of the records are from Wilmer Common, an area inland of the Sector to the west side of Rodley village. All records are from the winter period.

There is a single record of two white-fronted geese viewed from Epney, assumed to be on Upper Dumball. This count does not exceed the 1% SPA population threshold for this species (3 birds).

There are 47 records of Shelduck within or adjacent to the Sector, with one record of a group exceeding the 1% SPA population threshold for this species (36 birds). This was at Wilmer Common in winter. Counts from Longney Sands ranged between three and 28 birds.

There are 21 records of Wigeon within or adjacent to the Sector, with 12 of them counts of birds in excess of the 1% SPA population threshold for this species (72 birds). A further count of 67 approaches this threshold. Of these records, six refer to the upstream end of the Sector, with counts between 90 and 120 opposite Longney Crib and a single count of 500 on the river.

Gadwall have not been recorded in or near to the Sector, but have been recorded at Wilmer Common. In that area, numbers have exceeded the 1% SPA population threshold on all six occasions. The highest count was 30 birds. All records are from the winter period.

Teal have been recorded 15 times in the area around the Sector, with three counts exceeding the 1% SPA population threshold for this species (62 birds) All of these counts are from Wilmer Common. Within the Sector, numbers are considerably lower.

There are 54 records of Mallard within or adjacent to the Sector, with 10 records of groups exceeding the 1% SPA population threshold for this species (28 birds). Seven of these refer to Wilmer Common and three to Longney Sands (two from the winter and one from the autumn passage periods).

There are seven records of Shoveler within or adjacent to the Sector, with five records of groups exceeding the 1% SPA population threshold for this species (five birds), one on Longney Sands and four at Wilmer Common.

There are four records of Pintail within or adjacent to the Sector, with three records of groups exceeding the 1% SPA population threshold for this species (six birds).

A single Tufted Duck has been recorded only once at Framilode Passage, during spring passage.

Waders

There are only two records of Grey Plover from within the Sector and both are of birds flying over only.

There are four records of Ringed Plover within the Sector. None of them came near to the 1% SPA population threshold (13 birds).

There are 92 records of Lapwing within, or near to the Sector, with 51 of these records of flocks in excess of the 1% SPA population threshold (105 birds). A further one record is of a flock very close to the threshold. There are a total of eight counts for Upper Dumball where the 1% threshold was nearly reached or exceeded, with flocks of between 100 and 500 recorded. Numbers in autumn ranged between 100 and 500 and in winter numbers were between 185 and 500.

At the downstream end of this Sector, there are records of Lapwing numbers meeting, exceeding or nearly meeting the 1% threshold on 40 occasions. Of these records, 34 are from the winter period and six from the autumn passage period. Flocks in autumn of between 110 and 270 have been recorded on the mud and sand banks between Framilode and Blue Boys Farm/ Lower Dumball and on Lower Dumball itself. Numbers in the same area ranged between 130 and 3000.

There are 71 records of Curlew within the Sector, with 41 of these records of flocks in excess of the 1% SPA population threshold (37 birds). A further three records are of flock sizes very close to the threshold. There is only one count from the spring passage period where the 1% threshold was nearly reached. This was a count of 36 birds, at "Longney Crib". This is thought likely to be a reference to Upper Dumball, where roosting birds were seen during the surveys. Here, there are only two autumn counts where the 1% threshold was nearly reached or exceeded, with flocks of 35 and 80 recorded. In winter, there are six records of flocks exceeding the 1% threshold ranged between 55 and 180 birds.

At the downstream end of this Sector, there are records of Curlew numbers meeting, exceeding or nearly meeting the 1% threshold on 14 occasions. Of these records, 13 are from the winter period and one from the autumn passage period. Flocks of between 36 and 90 have been recorded on the mud and sand banks between Framilode and Blue Boys Farm/ Lower Dumball. Flocks on Lower Dumball described as feeding on fields inland of the flood bank have been recorded nine times, with numbers ranging between 40 and 145. All but one of these records are for the winter period.

Whimbrel have been recorded nine times in the Sector, all during spring passage. Six of these counts equalled or exceeded the 1% SPA population threshold of 2 birds. The highest count, from Upper Dumball, was of 57 birds.

Dunlin have been recorded 30 times in the Sector, but only once in a number exceeding the 1% SPA population threshold. This record, as well as another one of a flock nearly meeting the threshold, were both on intertidal mud at Priding (Framilode) during the winter period. The other records are largely of numbers below 10 birds.

There is a single record of one Redshank at Longney Sands during the early autumn passage period.

There are only three records of Knot from the Sector, with numbers of two and four in winter and 12 on spring passage. All records refer to the field opposite Longney Crib.

Snipe have been recorded 20 times in the Sector, on 13 counts numbers equalled or exceeding the 1% SPA population threshold (2 birds). The highest counts of between eight and 12 birds were opposite Longney Crib.

Black-tailed Godwit have been recorded seven times within the Sector, with numbers exceeding the 1% SPA population threshold (6 birds) on four occasions, on spring and autumn passage. Numbers ranged between eight and 38 birds, all reported from "Longney Crib" but thought likely to have actually been on Upper Dumball.

There are 40 records of Golden Plover in or near to the Sector, with 27 counts where the 1% SPA population threshold was met or exceeded (37 birds). Three of these counts, of 93, 200 and 550 are

from Upper Dumball, Rodley and Epney. These are thought likely to refer to the same area, probably at Upper Dumball. 19 of the records are from intertidal areas between Epney and Framilode/ Blueboys Farm, with counts ranging from 70 to 2000. Five of the counts are from Lower Dumball and the Blueboys Farm area, with numbers between 40 and 500. Two of the records here refer to flocks of 100 and 260 feeding in fields whilst the other records are non-specific. All but one record of this species are from the winter period.

Gulls

Gulls recorded within the Epney area include large flocks of common, herring and Lesser Black-backed Gull. Further downstream on this section, large flocks of Common Gull and low numbers of greater black-backed gull have been recorded.

15412 Severn – Arlingham – Uncounted Sector

Wildfowl

Low numbers of Shelduck and Teal have been reported, with a single record of 200 Wigeon at the end of January 2017. This exceeded the 1% SPA population threshold of 72 birds. Teal have been reported five times, with three of the records of roosting flocks (all in winter) in excess of the 1% SPA population threshold of 62 birds. The largest count was 170.

Waders

There is a single record of 40 Ringed Plover, from the spring passage period. This exceeds the 1% SPA population threshold (13 birds).

There are eight winter records of Lapwing flocks numbering in excess of the 1% SPA population threshold (105 birds) on the sands between Arlingham Passage and Newnham, with numbers between 350 and 750. There are also records of displaying Lapwing in spring.

Four flocks of Golden Plover numbering in excess of the 1% SPA population threshold (37 birds) have been recorded on the sands within this section, when 48, 65, 145 and 200 birds respectively were seen.

Very low numbers of other waders have been recorded, including Curlew, Whimbrel (12 birds) Dunlin and Turnstone. The one Grey Plover count of four birds exceeds the 1% SPA population threshold (3 birds).

Gulls

Large numbers of gulls have been recorded in the area, including up to 2000 Common Gull, in excess of 1000 herring gulls and up to 2800 Lesser Black-backed Gulls. Lower numbers of black-headed and Great Black-backed Gulls have also been recorded but many of these counts far exceed the 1% SPA population threshold (9, 3, 86 and 1 bird respectively).

15403 Awre – Uncounted Sector

Wildfowl

Low numbers of Shelduck, Wigeon and Teal have been recorded during winter, with numbers way below the 1% SPA population threshold (36, 72 and 62 birds respectively).

Waders

There are 14 reports, between 2011 and 2016, of Curlew flocks where the 1% SPA population threshold (37 birds) was exceeded. Of these records, numbers ranged between 63 and 140 during autumn passage and 65 to 200 in winter. Locations given are Whitescourt and Hall Farm, equating with the locations of the roosts identified by the field work in 2016 and 2017. Although within Awre parish they were actually nearer to Sector 15402 New Grounds, Slimbridge.

Lapwing counts at Whitescourt have exceeded the 1% SPA population threshold (105 birds) in four out of five reports in winter.

There are a few records of Dunlin and Redshank in the area but none of the counts equal or exceed the 1% SPA population thresholds (252 and 40 birds respectively).

Low numbers of Grey Plover and Golden Plover have been recorded both on the estuary and inland of the flood embankment, but on only two occasions and way below the 1% SPA population threshold (3 and 37 birds respectively).

Ringed Plover has been recorded on two occasions during autumn passage. The records are of one and three birds respectively.

Snipe have been recorded eight times, with the 1% SPA population threshold (2 birds) exceeded on five occasions.

Turnstone have been recorded during spring passage on three occasions, each recording just a single bird.

Whimbrel have been recorded at Whitescourt twice, with a count of 10 in May 2012 exceeding the 1% SPA population threshold (2 birds).

15414 Frampton Realignment – Uncounted Sector

Wildfowl

Bewick's Swan has been recorded on the Sector twice, at the North Reedbed (near to Splatt Bridge) and Saul Warth. The counts of nine and two birds respectively equal or exceed the 1% SPA population threshold for this species (2 birds). There is a further record of 80 Bewick's Swan seen on the estuary from "Frampton 100 acre" which is probably within the Slimbridge New Grounds Sector.

There is a single record of 19 European white-fronted geese "north of Splatt Bridge" from late winter 2013. This exceeds the 1% SPA population threshold (3 birds).

There are 81 records of Shelduck within the Sector, with 27 counts of numbers equalling or exceeding the 1% SPA population threshold (36 birds). This includes 16 counts on spring passage of between 36 and 280 birds, four counts on autumn passage between 48 and 80 birds and seven winter counts of between 42 and 180 birds. None of the reports are specifically of roosting birds and the higher numbers are thought likely to represent counts of birds feeding on the tidal mud.

There are six reports of Wigeon within the Sector, with none of the counts equalling or exceeding the 1% SPA population threshold (72 birds). Five of the records are from late winter and the last is from spring.

There are 18 reports of Gadwall, at the North Reedbed and Saul Warth, with 15 counts exceeding the 1% SPA population threshold (2 birds). Most reports are from late winter and spring.

There are 32 records of Teal within the Sector, with 10 counts exceeding the 1% SPA population threshold (62 birds). Of these records, numbers range between 80 and 300, from late winter to early spring. All but one record are from the North Reedbed, although this species occurs frequently over a wider area in the Splatt bridge area of the Sector (pers. obs.).

There are 19 records of Mallard within the Sector but none of these counts are of numbers exceeding the 1% SPA population threshold (28 birds).

There are 22 records of Pintail within the Sector, with seven counts equalling or exceeding the 1% SPA population threshold (6 birds). Of these records, numbers range between 6 and 41, all from late winter or early spring passage.

There are 11 records of Shoveler within the Sector, with three counts of numbers equalling or exceeding the 1% SPA population threshold (5 birds). All records for this species are from late winter and early spring.

There is a single record of four Tufted Duck on the North Reedbed. This does not reach the 1% SPA population threshold of 8 birds. It should be noted, however, that nearby waterbodies that are not part of the SPA regularly support numbers far in excess of this, including Frampton Court Lake and Frampton Sailing Lake.

Waders

There are 24 reports of Grey Plover within the Sector, with 17 counts equalling or exceeding the 1% SPA population threshold (3 birds). This includes 13 counts on spring passage of between 3 and 36 birds, three counts on autumn passage between 3 and 7 birds and one winter count of five birds.

There are 36 records of Ringed Plover within the Sector with 21 counts of numbers exceeding the 1% SPA population threshold (13 birds). These range between 17 and 210 on spring passage and between 20 and 200 on autumn passage. All reports are from Saul Warth. None of the records refer specifically to roosting birds and it is thought likely that the majority of records are for birds feeding on the tidal mud over a wide area.

There are 57 reports of Lapwing within the Sector, with only two counts in winter exceeding the 1% SPA population threshold (105 birds). The highest count was 500. There is a further one count that is close to the threshold, with other counts ranging between one and 12 birds in spring (including records of breeding), between one and 20 birds on autumn passage and between one and 50 birds in winter.

There are 139 reports of Curlew within the Sector, with 57 counts exceeding the 1% SPA population threshold (37 birds). Most reports are for Saul Warth and Splatt flashes. Spring passage numbers range between 40 and 160 birds, autumn passage numbers between 38 and 178 birds and winter numbers between 40 and 353 birds. This latter range of values belies the fact that the highest counts were in February, when many of the long-distance migrant birds wintering on the estuary are already gathering to return to breeding areas in north east Europe.

There are eight records of Whimbrel within the Sector, with seven counts equalling or exceeding the 1% SPA population threshold for this species (2 birds). Numbers from these counts, on spring passage, are between 2 and 16.

There are 66 records of Dunlin within the Sector but only two counts are of numbers exceeding the 1% SPA population threshold (252 birds). Two further counts are very close to this number. All four counts are from spring and autumn passage at Saul Warth. Typical spring passage numbers range between 2 and 70, with 3 counts above 100 but below the 1% SPA population threshold. Typical autumn passage numbers range between 1 and 100, with 1 count above 100 but below the 1% SPA population threshold. Typical winter numbers range between 1 and 65.

There are 75 reports of Redshank within the Sector, with only three counts in winter exceeding the 1% SPA population threshold (40 birds). All of these counts were in late winter, with the highest number recorded at 45. There are also records of breeding birds from 2013.

There have been no reports of Spotted Redshank on the database supplied County Bird Recorder in the last 5 years, but a bird has been seen at Splatt flashes in winter 2016-17. This number exceeds the 1% SPA population threshold.

There are 26 reports of Knot within the Sector, with seven counts equalling or exceeding the 1% SPA population threshold (21 birds). This includes four counts on spring passage of between 35 and 55 birds and four counts on autumn passage between 23 and 100 birds.

There are 10 reports of Snipe within the Sector, with all but one count equalling or exceeding the 1% SPA population threshold (2 birds). All reports are from the North Reedbed, with numbers between 2 and 23.

There are 45 records of Black-tailed Godwit within the Sector, with winter and passage numbers typically below 10. Higher counts in autumn range from 60 to 160 birds. The 1% SPA population threshold is equalled or exceeded on 25 counts, including the highest numbers of 85 and 160 during autumn passage but numbers ranging between six and 80 on spring passage and between 6 and 67 during winter.

There are only three reports of Golden Plover in the area (omitting fly-over records), with numbers falling short of the 1% SPA population threshold (37 birds) on each occasion.

Other records of note

The importance of the area for passage migrants is clear from additional records of non-SPA qualifying and assemblage species. For instance, There are 42 reports of Bar-tailed Godwit within the Sector, with numbers at Saul Warth typically in single figures, but reaching 450 birds in spring 2011. Other passage migrants recorded include garganey, Curlew sandpiper, greenshank, little stint and wood sandpiper.

15402 New Grounds, Slimbridge

Records described here have been selected from those outside of the WWT Slimbridge reserve but within the Sector. Data supplied by WWT and reported on in the Results section and Appendix 5, as well as the detailed knowledge of Martin McGill, are considered sufficient for roosting to be described adequately for the reserve itself. All records described here are from the area around Frampton Breakwater, the Noose and the Royal Drift.

Counts of Shelduck have been reported eight times from the Noose and Frampton Breakwater areas, with numbers exceeding the 1% SPA population threshold for this species (36 birds) on all counts, which are between 68 and 355.

Gadwall have been recorded four times in the area around Frampton Breakwater, with numbers exceeding on three occasions. The highest count was 16 birds.

There are four records of Mallard from Frampton Breakwater and the Royal Drift, with none of the counts meeting the 1% SPA population threshold for this species (28 birds).

There is a single record of one Shoveler in the area by Frampton Breakwater.

Pochard records are restricted to two singles and a group of 16 in the area around Frampton Breakwater. This last count exceeds the 1% SPA population threshold for this species (five birds).

There are only three records of Pintail in the area around Frampton Breakwater, with two records of groups of 32 and 140 exceeding the 1% SPA population threshold for this species (six birds).

There are 26 records of Grey Plover from within the Sector, with 17 of them counts at or above the 1% SPA population threshold of 3 birds. Numbers in the area of Frampton Breakwater and The Noose were between one and 26 birds, with most records in the spring passage period.

There are eight records of Ringed Plover within the Frampton Breakwater area, with three counts of 19, 95 and 102 exceeding the 1% SPA population threshold of 13 birds. Most records are from the spring and autumn passage periods.

There are eight records of Lapwing in the area around Frampton Breakwater, with none of the counts reaching the 1% SPA population threshold (105 birds).

There are 18 records of Curlew within the area by Frampton Breakwater, with eight of them counts exceeding the 1% SPA population threshold of 37 birds. These counts are of between 40 and 175.

Whimbrel have been recorded twice in the area around Frampton Breakwater, with one count exceeding the 1% SPA population threshold of 2 birds.

Dunlin have been recorded 24 times in the area around Frampton Breakwater, but only once in a number exceeding the 1% SPA population threshold for this species, with a count of 310 birds.

There are five records of Redshank in the Frampton Breakwater area but none of the counts exceeded the 1% SPA population threshold of 40 birds.

There are 14 records of Knot from the Sector, with birds recorded on the Royal Drift and around Frampton Breakwater. Numbers of between one and 20 birds, mostly on spring and autumn passage, did not reach the 1% SPA population threshold of 21.

Black-tailed Godwit have been recorded four times in the vicinity of Frampton Breakwater, with numbers exceeding the 1% SPA population threshold (6 birds) on two occasions, in the spring and autumn periods. Numbers on these counts ranged between five and 84 birds.

There are only two records of Golden Plover in the area of Frampton Breakwater, with low numbers on both counts.

Gulls recorded within the Sector outside of the WWT reserve include roosting Great Black-backed Gulls on the Frampton foreshore and the Noose, herring, lesser black-backed and Common Gulls at Frampton and the Royal Drift. The low number of records suggests a lack of recording effort rather than a lack of birds.

15411 Severn - Purton to Brims Pill – Uncounted Sector

Wildfowl

Low numbers of Shelduck, Mallard and Gadwall have been recorded in this Sector. There are seven records of Wigeon, with numbers exceeding the 1% SPA population threshold (72 birds) on six occasions, with numbers between 130 and 450. All of these higher counts were in winter.

Waders

Low numbers of Lapwing, Curlew, Whimbrel, Dunlin and Redshank have been recorded on the Purton side of the estuary. Low numbers of wintering Redshank have been recorded on Brims Pill but the 1%

SPA population threshold was not equalled or exceeded on any of the counts reported. Snipe have been recorded three times, with the 1% SPA population threshold exceeded on two occasions.

Gulls

Large numbers of black-headed and Common Gulls, as well as less significant numbers of herring, lesser black-backed and Great Black-backed Gulls have been recorded in the Sector, but roosting was not mentioned.

15409 Severn - Purton to Naas – Uncounted Sector

There are only three records from this Sector, of low numbers of black-headed and herring gulls and Canada geese.

15410 Severn – Sharpness – Uncounted Sector

Wildfowl

There is a single record of White-fronted Goose, of 200 birds in flight only.

There are 223 records of Shelduck, with numbers exceeding the 1% SPA population threshold (36 birds) on five occasions. Only one of these records is of birds not in flight, with 60 recorded at the lifeboat station in the late spring period. There are four WeBS count records of between 1 and 8 birds with two from the winter period and two from the spring period. The species is present throughout the year, with 10 records of breeding within the Sector.

There are 182 records of Wigeon (excluding records of birds in flight only),, with numbers exceeding the 1% SPA population threshold (72 birds) on 51 occasions, with numbers between 80 and 710. There are a further five records of 70 birds. The majority of records are from the winter period. Of the seven WeBS counts recorded, numbers were between 45 and 710.

There are 10 records of Gadwall, with numbers equalling or exceeding the 1% SPA population threshold (2 birds) on six occasions, with counts of between 2 and 15 birds.

There are 28 records of Teal, with numbers exceeding the 1% SPA population threshold (62 birds) on two occasions, with counts of 200 and 1300 on the river upstream of the lifeboat station. WeBS count records of this species are of three, four and 35 birds. All of these notable records are from the winter period.

There are 65 records of Mallard, with numbers exceeding the 1% SPA population threshold (28 birds) on 22 occasions, with numbers between 29 and 150. The docks are clearly used by birds in eclipse plumage in late summer. There is also a reference to 68 birds roosting at high tide during the autumn period on The Ridge Sand, which corresponds roughly with the area where birds were noted roosting in 2016-17.

There are seven records of Pintail, with numbers exceeding the 1% SPA population threshold (6 birds) on two occasions. Of these, one record is for birds in the harbour mouth whereas the other refers to birds flying over.

There are seven records of Shoveler not in flight within the Sector, with numbers exceeding the 1% SPA population threshold (5 birds) on five occasions, with numbers between seven and 20. All of these records are from the winter period.

There are two records of Pochard, but only one refers to a bird not flying over. The single count of one bird does not equal or exceed the 1% SPA population threshold (5 birds) and is noted as an unusual occurrence.

There are 102 records of Tufted Duck, with numbers equalling or exceeding the 1% SPA population threshold (8 birds) on 27 occasions, with numbers between eight and 20. All but one of these records are from the docks, with 18 during the autumn and eight from the winter. There are also three records of breeding, all from the Ridge Sands area.

Waders

There are three records of Grey Plover, with only one not referring to birds flying over. The 12 birds counted on spring passage exceeded the 1% SPA population threshold (3 birds).

There are five records of Ringed Plover (excluding records of birds in flight only), with numbers not exceeding the 1% SPA population threshold (13 birds) on any of the counts, which were of between one and seven birds in late winter and on autumn passage.

There are 142 records of Lapwing (excluding records specifically referring to birds in flight), with numbers exceeding the 1% SPA population threshold (105 birds) on 11 occasions, with a further count of 100 birds very close to the threshold. However, only four of all the records refer specifically to birds on the ground/ shore, with a count of 18 in the autumn and counts of 20, 50 and 150 during the winter period.

There are 288 records of Curlew, with numbers exceeding the 1% SPA population threshold (37 birds) on two occasions, with counts of 75 (spring) and 87 (autumn) from Sharpness lifeboat station. There are no details on what the birds were doing but it is thought likely that these birds were flying through only, as all 27 records with accompanying notes are of this behaviour.

There are 26 records of Whimbrel (excluding records specifically referring to birds in flight), with numbers equalling or exceeding the 1% SPA population threshold (2 birds) on 12 occasions, with counts of between two and nine birds. 11 of the records are from the spring passage period, with one from autumn.

There are 93 records of Dunlin, with numbers exceeding the 1% SPA population threshold (252 birds) on two occasions, with a further two counts of 250. All four records are from the winter period, with one reference to birds being on the shore by the sewage works and one "after morning high tide".

There are 213 records of Redshank, with numbers equalling or exceeding the 1% SPA population threshold (40 birds) on 11 occasions. Of these, one record refers to 69 birds on The Ridge Sand area during the autumn period but for the other records it is not clear what birds were doing, so flight records could not be discounted.

There are four records of Spotted Redshank, with three counts of one bird and one count of two birds, all from the area north of the lifeboat station/ The Ridge Sand. As the 5 year mean peak is only 10 birds, the 1% SPA population threshold was exceeded on all counts.

There are four records of Turnstone, with numbers exceeding the 1% SPA population threshold (5 birds) on one occasion, when 11 birds were counted during spring passage. The other records are from the autumn and winter periods.

There are two records of Knot, with counts of 15 in the spring and two birds in the autumn periods not exceeding the 1% SPA population threshold (21 birds).

There are 13 records of Snipe, with numbers equalling or exceeding the 1% SPA population threshold (2 birds) on six occasions, with numbers between 2 and 15. Of these records, there are four references to high tide counts. 10 birds were counted on two occasions in winter from near the lifeboat station, 15 were recorded on floating reeds north of that area and there is a count of 11 birds from a WeBS count, also in winter.

There are 10 records of Golden Plover, but all but one of them is of birds flying over. A single bird has been recorded once on the shore in winter.

Gulls

There are 109 records of Black-headed Gull, with numbers (excluding fly-over records) exceeding the 1% SPA population threshold (86 birds) on 15 occasions. The only reference to a high tide count is of 350 birds on an ebbing tide at the harbour mouth during the spring period. 11 records are from the autumn and a further three are from the spring periods.

There are 96 records of Common Gull, with numbers exceeding the 1% SPA population threshold (2 birds) on 75 occasions. Between 75 and 400 birds have been recorded on fields in the area. The rest of the records have no notes or refer to birds flying over.

There are 30 records of Lesser Black-backed Gull, with numbers equalling or exceeding the 1% SPA population threshold (3 birds) on 17 occasions. Six of these records relate to the gull colony at the docks. Of the remaining 10 records, eight refer to the Sector number so are probably high tide counts. These are of between three birds in winter and 30 birds in spring.

There are 27 records of herring gull, with numbers equalling or exceeding the 1% SPA population threshold (9 birds) on 11 occasions. Five of these records relate to the gull colony at the docks. Of the remaining six records, only one refers to a count at high tide of 9 birds. The other records are of between 10 and 300 birds but there are no accompanying notes.

There are 190 records of Great Black-backed Gull, with numbers exceeding the 1% SPA population threshold (1 bird) on 103 occasions. Counts were between one and 14 birds, with numbers below 10 on the majority of the counts. The harbour mouth and the docks are referred to as locations for most of the records, with one confirmed and one possible breeding record.

15406 Berkeley Shore – Counted Sector

Wildfowl

There are 37 records of Shelduck, with numbers never exceeding the 1% SPA population threshold (36 birds). The highest count was of 26 birds. Counts recorded were mainly below 10 individuals.

Gadwall have been recorded twice, with numbers exceeding the 1% SPA population threshold on both occasions. There is a single record of one Pintail during the autumn passage period. There is also a single winter record of two Shoveler.

There are 50 records of Wigeon, with numbers exceeding the 1% SPA population threshold (72 birds) on 18 occasions. The majority of these records are from Berkeley Pill in the winter.

There are 41 records of Teal, with numbers exceeding the 1% SPA population threshold (62 birds) only once, with a count of 100 birds (in winter). 27 of the records are of 14 birds or fewer.

Waders

There are six records of Grey Plover, with numbers exceeding the 1% SPA population threshold (3 birds) on two occasions.

There are 11 records of Ringed Plover, ranging from 1 to 7 birds for all but one count, where 65 were recorded. This was the only count where numbers exceeded the 1% SPA population threshold (13 birds)

There are 13 records of Lapwing, with numbers exceeding the 1% SPA population threshold (105 birds) on three occasions.

Curlew have been recorded in low numbers on Berkeley shore and the Pill, with an exceptional flock of 300 in July 2015 being the only count to exceed the 1% SPA population threshold.

Between 1 and 150 Dunlin have been recorded here, with counts most often below 10 birds.

There are 67 records of Redshank, mostly from Berkeley Pill, with numbers exceeding the 1% SPA population threshold (40 birds) on three occasions, one of which is during autumn passage and the other two during winter. The other counts range between 1 and 36 birds.

There are 25 records of Whimbrel, with 19 of the counts equalling or exceeding the 1% SPA population threshold (2 birds), during both spring and autumn passage.

There are three records of single Spotted Redshanks, with one in each of the spring and autumn passage and winter periods.

There are 29 records of Turnstone, with numbers exceeding the 1% SPA population threshold (5 birds) for 15 of them. Four records during spring passage range from seven to 23 birds, two records in autumn are for 35 and 48 birds, whilst there are nine records of between 6 and 29 birds.

There are 4 records of Knot, with numbers not exceeding the 1% SPA population threshold (21 birds).

There are 53 records of common Snipe, most of which relate to Berkeley Pill. 38 of these records are of counts equalling or exceeding the 1% SPA population threshold for this species (2 birds), with 11 records of numbers between 10 and 42. Most counts are from the winter period.

There are two records of single Black-tailed Godwits on autumn passage.

There are five counts of Golden Plover, with numbers exceeding the 1% SPA population threshold (37 birds) on three occasions, over the winter and spring periods.

15203 Lydney Harbour Pools – Uncounted Sector

Wildfowl

There are four records of Shelduck at Lydney Harbour Lakes, with numbers never exceeding the 1% SPA population threshold (36 birds).

There is a single record of 15 Wigeon from the Sector. This does not meet the 1% SPA population threshold (72 birds).

There are five records of Gadwall, with numbers exceeding the 1% SPA population threshold (2 birds) on each occasion. Numbers were between five and 15.

There are 11 records of Mallard, with numbers exceeding the 1% SPA population threshold (28 birds) on five occasions, with these counts between 31 and 74. All but one of the high counts are from the autumn period.

There are five records of Tufted Duck, with numbers exceeding the 1% SPA population threshold (8 birds) on four occasions. Numbers ranged between 17 and 30, with two records from spring, one from autumn and one from the winter period.

Gulls

Black-headed Gull numbers within the Sector have been high, with count in the hundreds and one of 500 birds. Numbers of Common Gull have been far lower. Herring and Lesser Black-backed Gull numbers have reached 100 and 150 respectively but are more typically well below this. There is a single record of greater black-backed gull.

15408 Severn - Lydney Marsh

Wildfowl

There are nine records of Shelduck, with numbers not exceeding the 1% SPA population threshold (36 birds).

There is a single record of 150 Wigeon from the winter period. This exceeds the 1% SPA population threshold (72 birds).

There are two records of Teal, with numbers not exceeding the 1% SPA population threshold (62 birds).

There are six records of Mallard, with numbers not exceeding the 1% SPA population threshold (28 birds).

Waders

There are two records of Grey Plover, with numbers equalling the 1% SPA population threshold (3 birds) on one occasion.

There is a single record of a single Ringed Plover. This does not exceed the 1% SPA population threshold (13 birds).

There are 23 records of Lapwing, with numbers exceeding the 1% SPA population threshold (105 birds) on 13 occasions. A further one count was of 100 birds. Most of the higher counts are from the winter period.

There are 10 records of Curlew, with numbers exceeding the 1% SPA population threshold (37 birds) on four occasions. Of these, there are references to flocks of 200 in spring and 320 in winter feeding in fields at high tide. The highest count of 630 birds was during autumn passage at low tide on Lydney Sand.

There are three records of Whimbrel, with numbers exceeding the 1% SPA population threshold (2 birds) on all counts, which were of five, nine and 19 birds. These were during autumn passage.

There are 7 records of Dunlin, with numbers not exceeding the 1% SPA population threshold (252 birds). The highest count was of 70 birds in a waterlogged field.

There are seven records of Redshank, with numbers not exceeding the 1% SPA population threshold (40 birds).

There is one record of one Knot, on autumn passage. The 1% threshold is 21 birds.

There are 13 records of Snipe, with numbers exceeding the 1% SPA population threshold (2 birds) on five occasions. There is one count of 23 birds.

There are 17 records of Golden Plover, with numbers exceeding the 1% SPA population threshold (37 birds) on 13 occasions. Numbers range between 40 and 200, across spring and autumn passage and winter periods. None of these records specifies behaviour of the flocks counted.

Gulls

There are relatively few gull counts within the Sector. Black-headed Gull numbers have reached 500 but are more typically below 100. Common Gull numbers have reached 250 but there are only three counts available. The highest count of herring gull is of 25 birds and for lesser black backed gull the highest number is 100, with numbers more typically below 10.

15404 Severn - Aylburton to Guscar – Uncounted Sector

49 species of wetland bird have been recorded in the Aylburton/ Alvington Court/ Warth/ Guscar areas between January 2011 and January 2017. Of most significance to this study are the following:

Wildfowl

White-fronted geese have been recorded on Aylburton Warth only once (two birds). Whooper Swans have been recorded six times, with two individuals seen on each occasion at either Aylburton or Guscar. All records of this species are from the first four months of 2016.

There are 104 records of Shelduck in the area. Of these, individual counts exceed the 1% SPA population threshold (36 birds) seven times, with all of these groups at Aylburton Warth, occurring in winter and spring. Signs of breeding have been recorded on numerous occasions.

Wigeon have been recorded in the area 47 times, with specific reference to a high tide roost on two occasions. 13 records are of counts equalling or exceeding the 1% SPA population threshold (72 birds), with all of them at Guscar. Of these, there is one count of 110 in spring, three counts of between 110 and 140 in autumn and nine counts of between 80 and 300 birds in winter. There is one autumn count from Aylburton of 70 birds that is close to the 1% threshold.

Low numbers of Gadwall have been recorded twice, although one count of four birds exceeded the 1% SPA population threshold (2 birds). Mallard were recorded 9 times and Shoveler have been reported twice, but numbers never approached the 1% SPA population threshold for either species.

Teal have been reported in the area 48 times, but numbers have equalled or exceeded the 1% SPA population threshold (62 birds) only three times, all at Guscar. Two of these reports were during the winter and once during autumn passage. Counts of 40, 50 and 60 were reported for both Guscar and Aylburton Warth in autumn and winter.

Tufted Duck has only been reported once, from Aylburton Warth.

Waders

There are 246 records of Curlew in the area. Of these, individual counts exceed the 1% SPA population threshold (37 birds) 208 times, including:

Once at Alvington Court - 80 birds "In field to west of railway line at high tide" equating to the Alvington Court/ Rodmore Mead area where flocks were seen in 2016-2017.

45 times at Aylburton Warth, including 21 specific references to high tide roosts. Of these records, numbers ranged between 10 and 800 on spring passage, 50 and 325 on Autumn passage and 115 and 600 in winter.

162 times at Guscar, including 104 specific references to high tide roosts. Of these records, numbers ranged between 55 and 350 on spring passage, 185 and 960 on Autumn passage and 45 and 600 in winter.

There are 90 reports of Whimbrel in the area, including 30 specific references to high tide roosts. Counts at Aylburton Warth ranged between 1 and 50 birds on spring passage and between 1 and 2 on Autumn passage. 14 reports from Aylburton are of groups of birds equalling or exceeding the 1% SPA population threshold (2 birds). Counts at Guscar Rocks ranged between 1 and 40 on spring passage and between 1 and 3 on Autumn passage. 40 reports from Guscar are of groups of birds equalling or exceeding the 1% SPA population threshold (2 birds).

There are 215 records of Dunlin in the area. 85 records make specific reference to high tide roosts. Of these, individual counts equal or exceed the 1% SPA population threshold (252 birds) only four times, all at Aylburton Warth in winter, with the majority of counts below 100. At Guscar, numbers reached 200 four times.

There are 37 records of Golden Plover in the area. Of these, individual counts exceed the 1% SPA population threshold (37 birds) 16 times, including:

14 times at Aylburton Warth including four specific references to high tide roosts. Of these records, there are none of birds on spring passage, a single record of 80 birds on autumn passage and between 39 and 250 in winter.

Two times at Guscar, with one record of 86 birds on spring passage and one of 100 birds in winter.

There are 16 records of Grey Plover in the area. Of these, individual counts exceed the 1% SPA population threshold (3 birds) seven times, including 6 times on spring passage and once on autumn passage.

There are 144 records of Lapwing in the area including 17 specific references to high tide roosts. Of these, individual counts exceed the 1% SPA population threshold (105 birds) 14 times, including:

Nine times at Aylburton Warth. Of these records, numbers ranged between 132 and 250 on Autumn passage and 120 and 1000 in winter. There are no spring passage records of roosting birds, although there are numerous records of breeding birds.

Five times at Guscar, including two specific references to high tide roosts. Of these records, numbers during the two counts in autumn were both of 150 birds, and ranged between 120 and 800 in winter.

There are 145 records of Redshank in the area. Of these, individual counts never exceeded the 1% SPA population threshold (40 birds), with most counts below 10 individuals. 119 of the records are from Guscar, with 51 of them referring to high tide roosts. Of these records, numbers during spring passage ranged between 1 and 10, during autumn passage between 1 and 9 and in winter between 1 and 34. Of the 16 reports of Redshank at Aylburton Warth, there is only one record of roosting birds, with a count of 30 in late winter 2013. There are also 7 non-specific counts of between 10 and 20 birds for the late winter and spring passage periods.

There are 123 records of Ringed Plover in the area. Of these, individual counts equalled or exceeded the 1% SPA population threshold (13 birds) 36 times, including:

Eight times at Aylburton Warth, including three specific references to high tide roosts. Of these records, numbers only exceeded the 1% SPA threshold during spring passage, with one count of 12 on Autumn passage close to the threshold. Numbers in winter ranged between 1 and 5 in birds.

28 times at Guscar, including nine specific references to high tide roosts. Of these records, numbers ranged between 15 and 80 on spring passage and between 17 and 70 on Autumn passage. There were no winter records.

There are 37 records of Turnstone at both Aylburton and Guscar. Of these, individual counts equal or exceed the 1% SPA population threshold (5 birds) seven times, with a count at Aylburton of 30 birds during autumn passage and 20 birds at Guscar in winter.

The greatest numbers of Knot have been recorded in spring and autumn passage, but have never exceeded 22. Of the 26 records available, only one exceeds the 1% SPA population threshold (21 birds). This was at Guscar Rocks in August 2012.

There are 62 records of common Snipe in the area. Of these, individual counts exceed the 1% SPA population threshold (2 birds) 37 times, including:

23 counts of between two and 10 birds and nine counts of between 14 and 53 birds on Aylburton Warth, with the largest numbers in winter, as would be expected.

Four counts of between 2 and 5 birds at Guscar, in both autumn and winter.

These figures almost certainly reflect observer effort (whether or not birds were deliberately or accidentally flushed or passively observed) rather than true numbers of birds present at the time. However, the higher counts indicate the importance of the area.

Wintering Jack Snipe have been recorded seven times in the area, with numbers ranging between 1 and 3.

Gulls

Up to 2000 Black-headed Gulls have been counted, with numbers more usually in the low 100s. Many counts exceed the 1% SPA population threshold for this species (86 birds). Herring gull counts are restricted to two dates. On both, the counts exceed the 1% SPA population threshold for this species (9 birds).

In the context of the Severn estuary, numbers of Common Gull have been very low on the three counts reported, although this is thought to be due to a lack of recording rather than a lack of birds. However, all three counts were of numbers equalling or exceeding the 1% SPA population threshold for this species (2 birds).

Other species

Passage migrants noted previously include low numbers of Bar-tailed Godwit, Curlew sandpiper, greenshank, little stint, little Ringed Plover and Common Sandpiper. Bar-tailed Godwit has also been recorded during the winter period at Guscar. Black-tailed Godwit has only been recorded in low numbers in this area.

15405 Severn - Wibdon Wharf - Uncounted SectorWildfowl

There are 25 records of Shelduck, with numbers exceeding the 1% SPA population threshold (36 birds) only once, with a count of 40 in the winter period. None of the records refer specifically to roosting birds and one record is of breeding (an adult with 11 juveniles).

There are eight records of Wigeon, with numbers exceeding the 1% SPA population threshold (72 birds) on only one occasion, during the winter period. Other counts ranged between five and 50 birds, counted during the autumn and winter periods.

There are 10 records of Teal, with numbers exceeding the 1% SPA population threshold (62 birds) on three occasions. These counts in winter were of 70, 80 and 160 birds. Roosting was not referred to specifically.

There is a single record of 36 Mallard from the winter period. This number exceeds the 1% SPA population threshold (28 birds) but it may not relate to roosting birds.

There is a single record of one Shoveler from the winter period. This number does not exceed the 1% SPA population threshold (5 birds) and roosting is not referred to specifically.

There are no records of Bewick's Swan, White-fronted Goose, Gadwall, Pintail, Pochard or Tufted Duck.

Waders

There is a single autumn count of two Grey Plover at Wibdon Wharf. This number does not equal or exceed the 1% SPA population threshold (3 birds).

There are 11 records of Ringed Plover, with numbers exceeding the 1% SPA population threshold (13 birds) on one occasion, when a count of 22 birds was made in the spring period. Other counts were between one and four birds, with the majority of these records from the spring.

There are eight records of Lapwing, with numbers between two and eight birds. Four of the records are of territorial birds in the fields west of the railway line. These numbers do not equal or exceed the 1% SPA population threshold (105 birds).

There are 75 records of Curlew from Wibdon Wharf, with numbers exceeding the 1% SPA population threshold (37 birds) on 62 occasions. These records are of numbers between 40 and 800. Of the 16 autumn passage records, numbers range between 46 and 800; of the 18 spring passage records, numbers range between 40 and 400. The 28 records in winter range between 45 and 490.

Of all the Curlew records (above or below the 1% threshold), 47 are references to high tide counts, with nine referring specifically to roosting birds. Of the roosting records, six are of counts exceeding the 1% population threshold, with numbers between 60 and 400. All of the roosting records are from the autumn or spring passage periods, with a single count in late winter. There is a single count of 20 birds feeding in the fields to the west side of the railway, in the spring passage period.

There are 15 records of Whimbrel, with numbers exceeding the 1% SPA population threshold (2 birds) on eight occasions. All of these records are of high tide counts, with two records referring to roosting birds (four and seven birds respectively, on spring passage) and two referring to birds flying inland to feed in fields to the west of the railway line (45 and 80 birds, also on spring passage).

There are 23 records of Dunlin, with numbers never exceeding the 1% SPA population threshold (252 birds). 17 of the counts were at high tide, with numbers between 1 and 95. There is no specific

reference to roosting birds. Of the 23 records, three are autumn counts with numbers between one and three birds, seven are autumn counts between one and 17 birds and 12 records are of winter counts of between one and 95 birds.

There are 66 records of Redshank, with numbers between one and eight birds. These counts do not exceed the 1% SPA population threshold (40 birds). 18 of the counts relate to high tide and high tide roosts, with the range of numbers between one and four birds across all seasons. There are six actual or probable breeding records.

There is a single record of three Turnstone from the winter period. This number does not exceed the 1% SPA population threshold (5 birds) and roosting is not referred to specifically.

There is a single autumn count of one Knot at Wibdon Wharf. This number does not equal or exceed the 1% SPA population threshold (21 birds).

There are eight records of Snipe, with numbers equalling or exceeding the 1% SPA population threshold (2 birds) on four occasions. Of these records, there are three counts of two and one of three birds. All counts were during the winter period.

Gulls

There are no records of gulls in the Wibdon Wharf Sector.

15413 Severn - Hills Flats - Uncounted Sector

There are only a few records of wetland birds available from the area of Hills Flats, with reference made on all of them to Shepperdine Farm, at the north end of the Sector. The south end of the Sector is in South Gloucestershire and records were not obtained from that recording area.

There are two records of Mallard, with numbers not meeting or exceeding the 1% SPA population threshold (28 birds) on either count. There is also a single record of three Curlew.

14455 River Severn at Oldbury - Counted Sector

This Sector is in South Gloucestershire and records were not obtained from that recording area.

15407 Severn - Beachley to Pillhouse Rocks – Uncounted Sector

Wildfowl

Shelduck numbers at Beachley Point and Slimeroad Pill have never exceeded nine birds, and counts for the Sector as a whole never exceeded 27. These are well below the 1% SPA population threshold of 36 birds..

Wigeon have been recorded eight times within the Sector, with numbers exceeding the 1% SPA population threshold (72 birds) on one occasion, with a count of 137 at Beachley Point.

There are 11 records of Mallard, with only one count exceeding the 1% SPA population threshold of 28 birds.

Other wildfowl counts within the Sector were of low numbers of Mallard and Pochard.

Waders

The three Lapwing records from the area are of numbers approaching the 1% SPA population threshold but they do not relate to roosting birds. Curlew have been recorded at Chapel Rock six times, with numbers between 1 and 6. Whimbrel have been recorded 12 times, with numbers between 1 and 12. This includes two wintering records from 2016. Dunlin have been recorded three times, with numbers between 4 and 120. Redshank numbers have also been low, with only four records, none of which exceeded 15 birds.

Turnstone and Snipe have only been recorded once each at Beachley Point, with a count of 3 Snipe exceeding the 1% SPA population threshold (2 birds) for this species and 5 Turnstone equalling the threshold.

Other wader counts elsewhere within the Sector were of very low numbers of Curlew and low numbers of Redshank and Dunlin.

Appendix 3: Copies of the Interview and Site Visit forms

Interview Form	Date Form completed		WeBS Count Area
Name of WeBS counter			Roost no. (on map)
Roost site name (optional)			Approximate NGR
Current or historical roost?		If historical give date last used	
<p>Notes about survey coverage Please comment about any constraints/ difficulties encountered when covering your WeBS area, e.g. land access, health and safety issues. If there are any parts of your count area that you are unable to cover, please mark these on the site map.</p>			
<p>Patterns of roost site usage Are you aware of any general patterns that affect the usage of the roost by most species using the roost (e.g. tide-related or weather-related patterns of usage)? Is it used on all tides, just spring tides or just neap tides?</p>			
Habitat type	✓ if present	Description	Describe any other features present which may affect usage of the roost site (e.g. creek; outfall)
Mudflats			
Sandflats			
Upper saltmarsh			
Lower saltmarsh			
Rock outcrop			
Boulder/ shingle shore			
Artificial structure			
Open water			
Other			

Species recorded Please list any species that uses this roost site (or has used it over the last five years), and provide the best answers you can for the questions listed. Your estimates should relate to the last five years (i.e. since 2010/11). If numbers using the site are variable, it is fine to submit a range (e.g. 50-100) rather than an exact estimate for the numbers using the roost site. Use the comments box to note any other relevant information about roost usage patterns or behaviour for each species (e.g. 'only uses roost on passage'; 'only uses roosts on peak tides'; 'numbers were higher before 2010/11' etc).

Species	How often present (% visits)	Approx. numbers using roost site		Typical roost site behaviour(s) (e.g. roosting; feeding; bathing; preening)	Comments
		Typical high tide	peak high tide		

Disturbance events				Effect of disturbance event on roosting birds (specify if event affects all species or only particular species)
Sources of potential disturbance	Description	Frequency	Approx. duration (on average)	

Describe possible measures that could potentially mitigate disturbance:

Site Visit Form	Date of site visit		WeBS Count Area	
Name of WeBS counter			Roost no. (on map)	
Roost site name (optional)		Start time	Approximate NGR	
High tide		End time	Typical or peak HT?	
Additional notes about survey coverage i.e. to clarify or add to interview questionnaire				
Additional notes about Access				
Additional notes about patterns of roost site usage				
General observations about roost site made during visit (e.g. sightlines)				

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HABITAT DETAILS (run through answers given during interview; double check details on ground and mark different habitats on the map)

Habitat type	✓ if present	Map Ref.	Description	Describe any other features present which may affect usage of the roost site (e.g. creek; outfall)
Mudflats				
Sandflats				
Upper saltmarsh				
Lower saltmarsh				
Rock outcrop				
Boulder/ shingle shore				
Artificial structure				
Open water				
Other				

Species recorded Review and annotate answers provided during interview, in particular ask about typical roost site behaviours and whether WeBS counter is aware of any significant changes since 2005/06 – 2010/11 (or more recent or more historical changes). Record and map species present at the time of the visit and details of their behaviour.

Species	Map Ref.	Count	Behaviour(s) observed (e.g. roosting; feeding; bathing; preening)	Comments

Disturbance events				Effect of disturbance event on roosting birds (specify if event affects all species or only particular species)
Sources of disturbance	Description	Frequency during visit	Approx. duration	

Describe possible measures that could potentially mitigate disturbance:				

Appendix 4: Roost Occupancy of sub-sections within WeBS counting Sector 15402 - New Grounds, Slimbridge

Notes on terms used in table headings

Range of counts – the lowest and highest number of birds counted during the period January 2011 to February 2017.

Count during site visit – the site visit was on 15th January 2017

% of counts above 1% threshold – the percentage of counts during the period January 2011 to February 2017 where 1% or more of the SPA population (based on the most recent five year Mean peak counts for the Severn Estuary SPA, covering 2010/11 to 2014/15) was met or exceeded. This applies to SPA Qualifying and Assemblage species, SSSI and 1993 SPA citation species plus additional interest species Black-tailed Godwit and Golden Plover only. For all other species, “n/a” denotes “not applicable”.

SPA Primary Roost? – If the percentage of counts in the column to the left was 50% or more, the criteria for the site being an SPA Primary Roost would be met, hence a “Y” for “yes” and an “N” for “no”. Further explanation and discussion of this can be found in the body text of the report. This applies to SPA Qualifying and Assemblage species, SSSI and 1993 SPA citation species plus additional interest species Black-tailed Godwit and Golden Plover only. For all other species, “n/a” denotes “not applicable”.

Table A4.1 Species assemblage on the 100/50 acre, based on data supplied by WWT.

Species	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Mute Swan					2	31	7	n/a	n/a
Bewick's Swan	Y	Y			2	24	0	3	N
European White-fronted Goose	Y	Y			2	2	0	0	N
Shelduck	Y	Y			2	65	0	3	N
Mandarin duck					1	2	0	n/a	n/a
Wigeon		Y	Y		1	880	2	20	N
Gadwall	Y	Y			2	108	0	91	Y
Teal		Y			1	1,600	299	46	N
Mallard		Y			2	90	4	10	N
Pintail		Y			1	70	0	15	N
Garganey					1	4	0	n/a	n/a
Shoveler		Y			1	203	42	87	Y
Red-crested Pochard					1	1	0	n/a	n/a
Pochard		Y			1	23	0	10	N
Tufted Duck		Y			2	97	16	83	Y
Scaup					1	1	0	n/a	n/a
Lesser scaup					1	1	0	n/a	n/a
Little Grebe					1	24	2	n/a	n/a
Great Crested Grebe					1	7	0	n/a	n/a

Cont...	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
Species	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Cormorant					1	13	0	n/a	n/a
Bittern					1	2	0	n/a	n/a
Little Egret					1	10	1	n/a	n/a
Grey Heron					1	9	1	n/a	n/a
Glossy Ibis					1	1	0	n/a	n/a
Spoonbill					1	1	0	n/a	n/a
Water Rail					1	6	0	n/a	n/a
Moorhen					1	22	0	n/a	n/a
Coot					14	113	0	n/a	n/a
Common Crane					2	4	0	n/a	n/a
Oystercatcher					2	9	0	n/a	n/a
Little Ringed Plover					1	1	0	n/a	n/a
Golden Plover					6	6	0	0	N
Lapwing		Y			2	3000	0	1	N
Dunlin	Y	Y	Y		6	185	0	0	N
Ruff					2	2	0	n/a	n/a
Jack Snipe					1	2	0	n/a	n/a
Snipe			Y		1	51	1	27	N
Black-tailed Godwit					1	15	0	0	N
Curlew		Y	Y		2	320	0	11	N
Common Sandpiper					3	3	0	n/a	n/a
Green Sandpiper					1	21	0	n/a	n/a
Greenshank					1	3	0	n/a	n/a
Redshank	Y	Y	Y		2	30	0	0	N
Black-headed Gull					8	36	0	n/a	n/a
Lesser Black-backed Gull					4	4	0	n/a	n/a
Herring Gull					4	4	0	n/a	n/a
Common Tern					2	10	0	n/a	n/a
Kingfisher					1	1	0	n/a	n/a

Table A4.2 Species assemblage in the Grounds, based on data supplied by WWT.

Species	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Mute Swan					57	202		n/a	n/a
Bewick's Swan	Y	Y			1	306	5	32	N
Whooper Swan					1	186	0	n/a	n/a
Pink-footed Goose					1	1	0	n/a	n/a
Greylag Goose					3	420	97	n/a	n/a
Bar-headed Goose					2	2	0	n/a	n/a
Canada Goose					1	244	0	n/a	n/a
Barnacle Goose					2	2	0	n/a	n/a
Egyptian Goose					1	1	0	n/a	n/a
Ruddy Shelduck					1	1	0	n/a	n/a
Shelduck	Y	Y			1	266	40	47	N
Mandarin duck					1	4	2	n/a	n/a
Wigeon		Y	Y		2	34	0	0	N
Gadwall	Y	Y			1	55	2	0	N
Teal		Y			2	200	0	7	N
Mallard		Y			106	916	423	97	Y
Pintail		Y			2	332	0	15	N
Shoveler		Y			1	10	0	6	N
Pochard		Y			1	544	0	16	N
Ferruginous Duck					1	1	0	n/a	n/a
Tufted Duck		Y			8	514	134	96	Y
Scaup					2	2	0	n/a	n/a
Lesser scaup					1	1	0	n/a	n/a
Little Grebe					1	2	0	n/a	n/a
Great Crested Grebe					1	3	0	n/a	n/a
Cormorant					1	4	0	n/a	n/a
Grey Heron					1	4	1	n/a	n/a
Water Rail					1	4	0	n/a	n/a
Moorhen					14	251	249	n/a	n/a
Coot					2	362	78	n/a	n/a
Oystercatcher					1	6	0	n/a	n/a
Avocet					1	1	0	n/a	n/a
Lapwing		Y			2	240	2	3	N
Ruff					4	4	0	n/a	n/a
Black-tailed Godwit					16	227	0	6	N
Green Sandpiper					1	4	0	n/a	n/a
Redshank	Y	Y	Y		78	78	0	1	N
Black-headed Gull					40	300	0	n/a	n/a
Lesser Black-backed Gull					1	1	0	n/a	n/a
Herring Gull					1	4	0	n/a	n/a
Common Tern					4	4	0	n/a	n/a
Kingfisher					1	2	0	n/a	n/a

Table A4.3 Species assemblage at the Long Ground Pool, based on data supplied by WWT.

Species	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Mute Swan					1	5	0	n/a	n/a
Greylag Goose					2	138	0	n/a	n/a
Canada Goose					1	7	0	n/a	n/a
Ruddy Shelduck					1	1	0	n/a	n/a
Shelduck	Y	Y			1	56	4	9	N
Mandarin duck					1	1	0	n/a	n/a
Wigeon		Y	Y		2	86	0	1	N
Gadwall	Y	Y			2	38	10	54	Y
Teal		Y			2	76	0	1	N
Mallard		Y			9	354	61	37	N
Pintail		Y			1	44	12	12	N
Shoveler		Y			1	23	1	10	N
Pochard		Y			1	20	20	4	N
Tufted Duck		Y			3	77	15	57	Y
Goldeneye					1	1	0	n/a	n/a
Little Grebe					1	3	0	n/a	n/a
Great Crested Grebe					1	2	0	n/a	n/a
Little Egret					1	1	0	n/a	n/a
Grey Heron					1	1	0	n/a	n/a
Water Rail					1	2	0	n/a	n/a
Moorhen					2	40	0	n/a	n/a
Coot					2	28	6	n/a	n/a
Oystercatcher					1	2	0	n/a	n/a
Snipe			Y		1	1	0	0	N
Green Sandpiper					1	1	0	n/a	n/a
Black-headed Gull					80	80	0	n/a	n/a
Kingfisher					1	1	0	n/a	n/a

Table A4.4 Species assemblage on the Reserve, based on data supplied by WWT.

Species	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Mute Swan					3	12	6	n/a	n/a
Bewick's Swan	Y	Y			2	270	147	47	N
Whooper Swan					2	2	0	n/a	n/a
Tundra Bean Goose					1	3	0	n/a	n/a
Pink-footed Goose					1	2	0	n/a	n/a
European White-fronted Goose	Y	Y			3	560	142	79	Y
Greenland White-fronted Goose					5	5	0	n/a	n/a
Greylag Goose					1	520	84	n/a	n/a
Canada Goose					1	547	1	n/a	n/a
Barnacle Goose					1	232	181	n/a	n/a
Brent Goose					1	1	0	n/a	n/a
Egyptian Goose					1	1	0	n/a	n/a
Shelduck	Y	Y			1	171	12	47	N
Mandarin duck					1	1	0	n/a	n/a
Wigeon		Y	Y		1	5,000	1,142	49	N
Gadwall	Y	Y			1	84	4	83	Y
Teal		Y			1	3,015	1,005	70	Y
Mallard		Y			2	191	30	59	Y
Pintail		Y			2	265	146	25	N
Garganey					1	3	0	n/a	n/a
Shoveler		Y			1	113	16	79	Y
Pochard		Y			1	33	12	10	N
Tufted Duck		Y			2	110	13	56	Y
Lesser scaup					1	1	0	n/a	n/a
Smew					1	1	0	n/a	n/a
Little Grebe					1	6	2	n/a	n/a
Great Crested Grebe					1	2	0	n/a	n/a
Cormorant					1	3	1	n/a	n/a
Bittern					1	3	0	n/a	n/a
Little Egret					1	12	1	n/a	n/a
Grey Heron					1	11	2	n/a	n/a
Water Rail					1	12	2	n/a	n/a
Moorhen					1	40	8	n/a	n/a
Coot					1	103	6	n/a	n/a
Common Crane					3	14	0	n/a	n/a
Oystercatcher					1	8	0	n/a	n/a
Avocet					1	36	0	n/a	n/a
Little Ringed Plover					1	4	0	n/a	n/a
Ringed Plover			Y	Y	1	8	0	0	N
Golden Plover					1	4387	1	35	N
Grey Plover		Y	Y		1	34	0	3	N
Lapwing		Y			3	4400	758	57	Y

Cont...	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Knot			Y		1	19	0	0	N
Sanderling					1	1	0	n/a	n/a
Little Stint					1	3	0	n/a	n/a
Curlew Sandpiper					1	7	0	n/a	n/a
Dunlin	Y	Y	Y		1	2000	483	34	N
Ruff					1	23	15	n/a	n/a
Jack Snipe					1	1	0	n/a	n/a
Snipe			Y		1	53	2	47	N
Long-billed dowitcher					1	1	0	n/a	n/a
Black-tailed Godwit					1	437	1	47	N
Bar-tailed Godwit					1	2	0	n/a	n/a
Whimbrel		Y	Y		1	1	0	0	N
Curlew		Y	Y		2	199	15	19	N
Common Sandpiper					1	3	0	n/a	n/a
Green Sandpiper					1	26	0	n/a	n/a
Spotted Redshank				Y	1	3	0	43	N
Greenshank					1	12	0	n/a	n/a
Wood Sandpiper					1	2	0	n/a	n/a
Redshank	Y	Y	Y		1	45	0	3	N
Black-headed Gull					33	360	0	n/a	n/a
Mediterranean Gull					2	6	0	n/a	n/a
Lesser Black-backed Gull					4	4	0	n/a	n/a
Herring Gull					17	17	0	n/a	n/a
Glaucous Gull					1	1	0	n/a	n/a
Great Black-backed Gull					9	60	0	n/a	n/a
Kingfisher					1	4	0	n/a	n/a

Table A4.5 Species assemblage on the River, based on data supplied by WWT.

Species	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Bewick's Swan	Y	Y			4	5	0	5	N
European White-fronted Goose	Y	Y			28	28	0	3	N
Shelduck	Y	Y			8	355	31	71	Y
Wigeon		Y	Y		1	2,851	1,131	44	N
Gadwall	Y	Y			1	5	0	6	N
Teal		Y			3	518	0	10	N
Mallard		Y			2	38	0	1	N
Pintail		Y			2	800	0	31	N
Shoveler		Y			6	174	0	9	N
Ringed Plover			Y	Y	1	364	0	25	N
Golden Plover					1	1800	0	6	N
Grey Plover		Y	Y		1	20	0	19	N
Lapwing		Y			4	3782	0	3	N
Knot			Y		1	30	0	3	N
Dunlin	Y	Y	Y		1	2200	0	6	N
Black-tailed Godwit					1	73	0	3	N
Whimbrel		Y	Y		1	11	0	9	N
Curlew		Y	Y		1	490	2	57	Y
Redshank	Y	Y	Y		1	40	1	1	N
Turnstone			Y		1	6	0	3	N
Black-headed Gull					30	1200	0	n/a	n/a
Mediterranean Gull					1	1	0	n/a	n/a
Common Gull					1	130	0	n/a	n/a
Yellow-legged Gull					1	2	0	n/a	n/a
Lesser Black-backed Gull					6	65	0	n/a	n/a
Herring Gull					10	50	0	n/a	n/a
Great Black-backed Gull					3	30	0	n/a	n/a

Table A4.6 Species assemblage on the Rushy Pen, based on data supplied by WWT.

Species	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Bewick's Swan	Y	Y			4	145	0	21	N
Shelduck	Y	Y			2	162	110	31	N
Wigeon		Y	Y		1	8	0	0	N
Gadwall	Y	Y			1	15	0	46	N
Teal		Y			2	433	121	20	N
Mallard		Y			8	415	283	47	N
Pintail		Y			2	211	121	42	N
Shoveler		Y			1	8	1	6	N
Pochard		Y			2	301	99	30	N
Tufted Duck		Y			2	337	226	57	Y
Lapwing		Y			1	420	82	3	N
Snipe			Y		2	5	0	6	N
Black-tailed Godwit					1	49	0	4	N
Redshank	Y	Y	Y		1	10	1	0	N
Black-headed Gull					8	43	0	n/a	n/a

Table A4.7 Species assemblage on the South Finger Reedbed, based on data supplied by WWT.

Species	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Shelduck	Y	Y			1	25	0	0	N
Wigeon		Y	Y		3	22	0	0	N
Gadwall	Y	Y			1	16	0	13	N
Teal		Y			2	42	0	0	N
Mallard		Y			2	30	20	3	N
Shoveler		Y			1	34	0	4	N
Pochard		Y			2	2	0	0	N
Tufted Duck		Y			1	35	9	40	N
Lapwing		Y			1	1	0	0	N
Snipe			Y		2	2	0	1	N

Table A4.8 Species assemblage on the South Lake, based on data supplied by WWT.

Species	Species listing				Range of counts		Count during site visit	% of counts above 1% threshold	SPA Primary roost?
	SPA QS	SPA QA	SSSI	1993 SPA citation	From	To			
Shelduck	Y	Y			1	81	9	10	N
Wigeon		Y	Y		1	5	4	0	N
Gadwall	Y	Y			1	86	6	94	Y
Teal		Y			2	243	211	49	N
Mallard		Y			10	298	75	76	Y
Pintail		Y			1	6	0	3	N
Shoveler		Y			2	198	15	81	Y
Pochard		Y			1	157	30	36	N
Tufted Duck		Y			1	458	44	90	Y
Golden Plover					800	800	0	2	N
Lapwing		Y			2	2900	1550	33	N
Knot			Y		1	3	3	0	N
Dunlin	Y	Y	Y		1	800	196	3	N
Snipe			Y		1	25	0	14	N
Black-tailed Godwit					1	304	111	60	Y
Curlew		Y	Y		143	143	0	1	N
Spotted Redshank				Y	1	2	0	6	N
Redshank	Y	Y	Y		1	111	1	13	N
Black-headed Gull					60	361	0	n/a	n/a
Mediterranean Gull					2	3	0	n/a	n/a
Common Gull					3	16	0	n/a	n/a
Lesser Black-backed Gull					1	10	0	n/a	n/a
Herring Gull					8	97	0	n/a	n/a

Appendix 5: Maps

Further information

Natural England evidence can be downloaded from our [Access to Evidence Catalogue](#). For more information about Natural England and our work see [Gov.UK](#). For any queries contact the Natural England Enquiry Service on 0300 060 3900 or e-mail enquiries@naturalengland.org.uk.

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