



Environment, Roads & Facilities

Flood Risk & Infrastructure

Llanfairfechan Coastal Defences

Over Wintering Bird Survey Report

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Executive summary

Over wintering bird surveys were undertaken from November 2021 to February 2022 relating to the Llanfairfechan Coastal Defence Scheme, North Wales ("the Scheme").

The surveys were undertaken twice monthly (to include a high tide and low tide survey) to provide information on the local over wintering bird communities present and to highlight any potential for ornithological impacts and associated constraints that may be imposed upon the proposed development.

The purpose of this report is to document the findings of the overwintering bird surveys, to inform the proposed development and provide appropriate recommendations.

The survey method applied was The British Trust for Ornithology's Wetland Bird Survey, 'look-see' methodology with the entire Scheme area covered during the survey period. Important habitat areas identified within the Scheme survey area for overwintering birds include the boating pool and adjacent grassed areas, mouth of the Afon Ddu, intertidal area north of the Afon Ddu and the upper shore in the east and western ends of the Scheme area.

A total of 27 species were recorded during the surveys. Of these, four SPA species were observed (cormorant, great-crested grebe, oystercatcher and curlew). Oystercatcher were observed in moderate numbers whereas the others were present however, in much lower numbers.

General construction safeguards are recommended to be implemented for the Scheme, these include:

- Timing of works:
 - Appropriate tide cycle working i.e. working at mid-low tide only; and
 - Working during daylight hours only, avoiding the need for artificial lighting.
- Given that avoidance of the over wintering season is not possible for this Scheme, deploying an ecological watching brief, to monitor effects during works and with set procedures to pause/restart and stop or reschedule works should adverse effects be observed; and
- Toolbox talks given to all workers to advise on how best to minimise disturbance.

Given proximity to Special Protection Areas, it is recommended that a Habitats Regulations Assessment is undertaken to assess the significance of effects on SPA qualifying species and define the requirements of any mitigation.

1 Introduction

1.1 Project background

The sea defences at Llanfairfechan extend for approximately 1.8km around the coastline, comprising several forms of construction, using masonry, mass concrete and rock armour. The defences under consideration extend north-east to south-west from Shore Road East to the Afon Ddu (Llanfairfechan) and provide some protection to the promenade and town. However they are subject to overtopping during storm events and with climate change, the frequency and severity of these events is anticipated to increase. A section of the sea wall was breached during a storm in October 2021 with further damage to the frontage occurring in November and December that year. Storm Pierrick in April 2024 resulted in a flooding event across the entire Llanfairfechan frontage, including flooding of the properties lining the promenade. As a result, there is a need to improve the coastal defences along the frontage.

1.2 Site location

Llanfairfechan is a seaside town in North Wales, within the administrative area of CCBC. The A55 trunk road passes through the town, running parallel to the London-Holyhead railway, both of which separate the main town from the waterfront. The Scheme extends from the mouth of the Afon Ddu (Llanfairfechan) to the west, to the eastern extent of the promenade (see Red Line Boundary Plan ERCF2305N PLAN 009). The beach predominantly comprises sand and shingle with regular wooden groynes. A slipway is located in the centre of the Scheme area along with four pedestrian accesses through the sea wall, these are fitted with storm boards and a flood gate over winter periods. A pedestrian promenade and cycleway run along the length of the sea wall and are backed by the Promenade road to the eastern end of the Scheme. In the central section of the Scheme area, the promenade is separated from the road by amenity grassland and boat storage and to the western end, a car park and café. Residential houses, guest houses, a garden, playground and cafes line the vehicular promenade.

The Scheme itself focusses on the sea wall which separates the promenade from the beach. Though the existing sea wall is in relatively good condition, some sections require maintenance works which will be undertaken as part of the Scheme.

The national grid references for the western and eastern Scheme boundaries are approximately (SH 67834 75452) and (SH 68544 75570) respectively (see Red Line Boundary Plan, ERCF2305N PLAN 006 in Appendix A).

1.3 Scheme description

1.3.1 Coastal defence works

The proposed scope of work (see Design Drawings ERCF2305N PLAN 010 Proposed Sections, ERCF2305N PLAN 011 Proposed Sections, ERCF2305N PLAN 012 Proposed Elevations and ERCF2305N PLAN 013 Proposed Elevations in Appendix A) comprises repairs to, and increasing the height of, 725m of the existing sea wall by approximately 500mm using concrete. The main design consists of a cantilever retaining wall constructed from the promenade on the landward side of the existing sea wall, however approximately 140m will need to be constructed from the seaward side (from the promenade path on the seaward side of the wall).

This 140m length is to be constructed in front of the junction of the Promenade highway with Shore Road East and a private property. The design will consist of a 1.5m excavation in the existing promenade on the seaward side. The works in this location are approx. 3.0m above the

Mean High Water Spring (MHWS) and approx. 2.5m from the foreshore, meaning the works will have minimal intrusion on the beach in this area.

The Scheme is currently at the outline design stage and the methodology is yet to be formally established, however it is anticipated that works will comprise the following:

- Temporary scaffolding (if required) - for re-pointing works alone, to be lifted from the promenade side of the sea wall onto the beach and which will be removed between tides (the intertidal area will be accessed by personnel on foot for construction of the scaffolding);
- Resin injection of existing cracks/joints on seaward side of the wall;
- Increase in the height of the sea wall and tie-in with the existing promenade on the landward side using concrete;
- Excavation of 1.5m into the existing hardstanding promenade on the seaward side and increase in the height of the sea wall for 140m at the eastern end;
- Installation of weep holes and flap valves along the sea wall (from the landward side); and
- Construction of grasscrete parking on the promenade side of the sea wall.

Access to the foreshore will be gained using existing accesses. Works will be limited to lower tidal states and no plant or machinery will be required on the intertidal area for the works.

Method statements and risk assessments will be produced by the contractor prior to commencement.

1.3.2 Anticipated programme

As funding is yet to be secured for Scheme construction, the programme has not yet been confirmed. However, is anticipated to take 19 weeks with proposed working hours of 07:00 – 19:00, taking into account tidal constraints (low tide working).

Works through the winter period 2024/25 are anticipated due to funding constraints and to avoid busy holiday seasons.

1.4 Ecological context

1.4.1 Site habitats

The Scheme survey area briefly comprised the following:

- Intertidal area;
- Marine area;
- Afon Ddu (Llanfairfechan);
- Boating pool and amenity grassland; and
- Buildings and structures lining the promenade.

1.4.2 Designated sites with bird interest

1.4.2.1 Traeth Lafan/ Lafan Sands SPA and SSSI

Llanfairfechan is located directly adjacent to the Traeth Lafan/Lafan Sands Special Protection Area (SPA)¹ which is a site afforded statutory protection, both for its habitats and the species that occur within them. The SPA covers 2,642ha, comprising a large area of intertidal sandflats

¹ Natural Resources Wales, 2008. Traeth Lafan/ Lafan Sands, Conway Bay SPA – Core management plan [Online] Available at: [CONSERVATION OBJECTIVES FOR N2K SITES \(naturalresources.wales\)](https://naturalresources.wales/conservation-objectives-for-n2k-sites)

and mudflats located on the eastern edge of the Menai Strait. It regularly supports high numbers of wintering waterbirds such as oystercatcher and curlew. The site acts as a refuge area for oystercatchers displaced from the Dee estuary during storm conditions and is also an important moulting ground for great crested grebe (*Podiceps cristatus*) in the late summer/early autumn. In summary, designated features comprise Eurasian oystercatcher (*Haematopus ostralegus*), Eurasian curlew (*Numenius arquata*), red-breasted merganser (*Mergus serrator*), great crested grebe (*Podiceps cristatus*) and common redshank (*Tringa totanus*).

The SSSI² also comprises intertidal habitats and is designated for its dwarf eelgrass (*Zostera noltii*). It is the third most important site in Wales for wintering waterbirds, with an annual peak of 10,000 – 14,000 waders comprising 10 species. There are also up to 1,500 wintering duck. The sandflats are of national importance for great-crested grebe and red-breasted merganser (*Mergus serrator*), and regionally important for shelduck (*Tadorna tadorna*).

1.4.2.2 Liverpool Bay SPA

The Scheme is also located in close proximity to the Bae Lerpwl/Liverpool Bay SPA³ (approximately 250m south). The SPA covers an area of approximately 252,758ha and regularly supports approximately 6.89% of the British populations of red-throated diver (*Gavia stellata*), 10.31% of the biogeographical population of common scoter (*Melanitta nigra*), 6.84% of the British population of little tern (*Sternula albifrons*), 1.8% of the British population of common tern (*Sterna hirundo*) and also supports little gull (*Hydrocoloeus minutus*) (the population percentage of which is not given). In terms of use of the area, red-throated diver, common scoter and little gull are known as over wintering species, whilst little tern and common tern are summer visitors.

The Liverpool Bay SPA is also located approximately 250m from the sea wall at Llanfairfechan at its closest.

1.4.2.3 Ynys Seiriol/ Puffin Island SPA⁴

This SPA is located approximately 7km north north-west of Llanfairfechan. The SPA is designated as it regularly supports 1.35% of the NW European breeding population of cormorant (*Phalacrocorax carbo*).

1.4.2.4 Glannau Penmon – Biwmares SSSI⁵

Given its proximity to the Traeth Lafan, the shore of this SSSI provides an important high tide roost site for the waders that feed at Traeth Lafan.

1.4.2.5 Aber Afon Conwy Site of Special Scientific Interest (SSSI)⁶

The SSSI is located 6.5km east northeast of the site, of importance for its intertidal estuarine communities. In addition to its importance for terrestrial and invertebrate biology the site hosts frequently high numbers of waders, especially curlew (*Numenius arquata*), redshank (*Tringa totanus*) and oystercatcher (*Haematopus ostralegus*).

² NRW. Traeth Lafan SSSI citation [Online] Available at: [GWYNEDD/ARFON and ABERCONWY \(naturalresources.wales\)](http://GWYNEDD/ARFON and ABERCONWY (naturalresources.wales))

³ Natural England, 2012. Liverpool Bay / Bae Lerpwl Special Protection Area, Advice under Regulation 35(3) of The Conservation of Habitats and Species Regulations 2010 (as amended) [Online] Available at: [liverpool-bay-bae-lerpwl-spa-conservation-advice.pdf \(naturalresources.wales\)](http://liverpool-bay-bae-lerpwl-spa-conservation-advice.pdf (naturalresources.wales))

⁴ NRW, 2008. Ynys Seiriol/ Puffin Island Core management Plan [Online] Available at: [CYNGOR CEFN GWLAD CYMRU \(naturalresources.wales\)](http://CYNGOR CEFN GWLAD CYMRU (naturalresources.wales))

⁵ NRW, 2003. Glannau Penmon – Biwmares SSSI citation [Online] Available at: [CITATION \(naturalresources.wales\)](http://CITATION (naturalresources.wales))

⁶ NRW, 2003. Aber Afon Conwy SSSI [CITATION \(naturalresources.wales\)](http://CITATION (naturalresources.wales))

1.4.2.6 Other designated sites of relevance to bird species

The Menai Strait and Conwy Bay SAC⁷ is also located directly adjacent to the Scheme and is designated for its habitats, notably mudflats and sandflats not covered by seawater at low tide.

Although a non-statutory designation, the importance of the area for wild birds is also recognised by it lying within the Traeth Lafan, Conwy Bay Important Bird Area (IBA)⁸.

1.5 Purpose of this report

The purpose of this report is to set out the results of the over-wintering bird surveys undertaken by Mott MacDonald Ltd from November 2021 to February 2022 and to assess the potential impacts of the proposed Scheme, as far as is reasonably possible based on current understanding. Recommendations are provided for mitigation as appropriate.

⁷ JNCC, 2022. [Online] Available at: [Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay - Special Areas of Conservation \(jncc.gov.uk\)](https://jncc.gov.uk/y-fenai-a-bae-conwy-menai-strait-and-conwy-bay-special-areas-of-conservation)

⁸ Bird Life International, 2024. Traeth Lafan, Conwy Bay IBA [Online] Available at: [BirdLife Data Zone](https://www.birdlife.org/datazone/species/accounts/traeth-lafan-conwy-bay-iba)

2 Survey Methodology

2.1 Scope of the surveys

The Scheme area was surveyed over the 2021/22 winter period by Mott MacDonald Ltd and CCBC ecologists. Results of these surveys have been outlined and discussed below in Section 3. The survey area extended from the north-eastern promenade extent to the north-western West Shore allotments, also including a 100m buffer area either side.

2.2 Wetland Bird Survey (WeBS) methodology

The British Trust for Ornithology's Wetland Bird Survey, 'look-see' methodology⁹ was implemented for the surveys. The methods involve surveying all of a predefined area.

The coast was walked within two hours either side of high and low tide and undertaken during falling and rising tidal states to obtain a good representation of the bird species present during each part of the tidal cycle. The coast was walked at a constant pace with surveyors stopping every 150m to scan the immediate bay and sea area.

Species identified by sight or sound were counted and recorded separately for each feature along the coastline using an appropriate digital mobile device. Particular attention was paid to the presence of over-wintering SPA species and notes taken on behaviour, location, time spent at location and existing disturbance levels and any species responses to these, where relevant.

In order to maintain a relatively consistent ability to detect bird activity, the surveys were conducted where practicable in optimal or near optimal conditions and avoiding periods of heavy rain and/or strong wind (above wind Force 4) wherever possible.

2.3 Data collection

Birds identified by sight or sound were registered electronically, using the ArcCollector application in conjunction with Survey123. The identification, numbers of each bird species and activities were noted throughout the data collection period. Only notable bird species were recorded, which includes those that are afforded additional legal status and are of conservation concern i.e. Red and Amber Listed species.

2.4 Personnel

Each of the surveys were undertaken by competent ornithological surveyors, in accordance with the requirements of BS42020:2013¹⁰.

2.5 Survey details

Details of the survey visits have been outlined below in Table 2.1.

⁹ Bibby et al., 2000. Bird Census Techniques. Second Edition. Academic Press, London. ISBN 0-12-095831-7

¹⁰ BSI, 2013. British Standard 42020: 2013. Biodiversity – Code of practice for planning and development. British Standards Institution, London

Table 2.1: Llanfairfechan survey details

Date	Tidal state	Start/finish time (BST)	Cloud cover (Oktas)	Wind speed (Beaufort scale)	Precipitation	Temperature (degrees Celsius)	Notes
2 nd November 2021	Low tide	12:45 – 14:00	7	2 Light breeze	No	10	Flat sea, good visibility, cool
3 rd November 2021	High tide	08:00 – 10:00	6	1 Light air	Yes - spitting	8	Spitting with rain, big waves
1 st December 2021	High tide	08:15 – 09:45	8	4 Moderate breeze	Yes - drizzle	8	Constraints in daylight hours - survey started later, large waves.
2 nd December 2021	Low tide	13:20 – 16:00	5	3 Gentle breeze	No	8	Due to traffic on the A55, the survey started a bit later. Large number of gulls rafting and roosting.
13 th January 2022	Low tide	12:00 – 14:45	1	3 Gentle breeze	No	7	
14 th January	High tide	08:30 – 10:30	0	0 Calm	No	5	Cool, clear and still day.
08 th February 2022	Low tide	08:00 – 10:15	8	5 Fresh breeze	No	12	
09 th February 2022	High tide	14:40 – 16:15	3	2 Light breeze	No	8	

Source: Mott MacDonald, 2022

2.6 Survey limitations

The absence of a species is not conclusive proof that a species is not present or that it will not be present in the future. However, the field surveys do provide a good comprehensive understanding of wintering bird species that exist within the Scheme's footprint and surrounding areas which are likely to be impacted by the proposed works. Surveys were carried out in daylight hours only and therefore species behaviour and locations during the hours of darkness and/or twilight have not been recorded.

Additionally, due to daylight hours and tidal constraints, some surveys started later or earlier with daylight hours.

3 Survey Results

3.1 Survey results

The surveys identified a total of 27 bird species. Table 3.1 summarised the conservation status and location of the species identified. Full results are provided in Appendix B.

Table 3.1: Species identified and their conservation status

Species	Max count	SPA species	SSSI species	Section 7 priority species ¹¹	Birds of conservation concern ¹²
Black-headed gull (<i>Chroicocephalus ridibundus</i>)	200			✓	Amber
Brent goose (<i>Branta bernicla</i>)	10				Amber
Common gull (<i>Larus canus</i>)	2			✓*	Amber
Cormorant (<i>Phalacrocorax carbo</i>)	5	✓			Green
Curlew (<i>Numenius arquata</i>)	20	✓	✓	✓	Red
Dipper (<i>Cinclus cinclus</i>)	1				Amber
Eider (<i>Somateria mollissima</i>)	7				Amber
Great black-backed gull (<i>Larus marinus</i>)	8				Amber
Great-crested grebe (<i>Podiceps cristatus</i>)	1	✓	✓		Green
Greenshank (<i>Tringa nebularia</i>)	1				Amber
Grey heron (<i>Ardea cinera</i>)	1				Green
Greenfinch (<i>Chloris chloris</i>)	20				Red
Grey wagtail (<i>Motacilla cinerea</i>)	2				Amber
Herring gull (<i>Larus argentatus</i>)	300			✓	Red
House sparrow (<i>Passer domesticus</i>)	20			✓	Red
Lapwing (<i>Vanellus vanellus</i>)	45			✓	Red
Lesser black-backed gull (<i>Larus fuscus</i>)	5				Amber
Little egret (<i>Egretta garzetta</i>)	1				Green
Mallard (<i>Anas platyrhynchos</i>)	14				Amber
Mute swan (<i>Cygnus olor</i>)	9				Green
Oystercatcher (<i>Haematopus ostralegus</i>)	400	✓	✓		Amber
Pied wagtail (<i>Motacilla alba</i>)	1				Green
Red-breasted merganser (<i>Mergus serrator</i>)	1		✓		Amber
Redshank (<i>Tringa totanus</i>)	40		✓		Amber
Rock pipit (<i>Anthus petrosus</i>)	3				Green
Starling (<i>Sturnus vulgaris</i>)	50			✓	Red
Turnstone (<i>Arenaria interpres</i>)	16				Amber

*Dark-bellied brent goose (subsp. *bernicula*)

¹¹ Welsh Government, 2016. Section 7 Priority Species List [Online] Available at: [Wales Biodiversity Partnership - Section 7 \(biodiversitywales.org.uk\)](https://www.biodiversitywales.org.uk)

¹² BTO, 2021. Birds of Conservation Concern 5 [Online] Available at: [BB 2021 DECEMBER \(Med-res\) \(britishtobirds.co.uk\)](https://www.britishtobirds.co.uk)

3.1.1 Interpretation

Generally, the highest densities of birds were located at the mouth of the Afon Ddu. With the boating pool and surrounding grassed area providing roosting opportunities for numerous species.

3.1.1.1 High tide

At high tide, the boating pool and grassed areas surrounding it to the west of the Scheme area are utilised at high tide by mute swan, mallard and moderate numbers of gulls as a loafing and roosting area. During the February visit, 20 greenfinch were observed perched in the trees lining the boating pool. Dogs were noted to disturb roosting birds in this area from the grass into the pool on two of the visits.

Generally, limited bird numbers were present during the high tide surveys; during the November visit, most birds were observed in flight, passing over the site. Low numbers of redshank, turnstone and oystercatcher were noted feeding on the upper shore at the base of the seawall. During the November visit, moderate numbers of gulls were observed rafting north of the Pavilion car park with larger numbers present in the eastern half of the Scheme area rafting within 30m of the sea wall. For the remainder of the surveys generally, limited numbers of gulls were rafting. Individual cormorant, red-breasted merganser and great-crested grebe were noted feeding and loafing within 50m of the seawall.

West of the Scheme, adjacent to the listed buildings on the frontage, ten starling were observed roosting during the November visit. During the January visit, 20 house sparrow were observed perched in bushes of the front gardens lining the promenade.

The mouth of the Afon Ddu provided a high tide roosting and feeding site for gulls, redshank, turnstone, oystercatcher, mute swan and mallard. A dipper was observed during the November visit, feeding in the Afon Ddu, upstream of the footbridge.

3.1.1.2 Low tide

For the first survey in November, the area was surveyed up to the Glan y Mor Elias nature reserve. Here, approximately 45 lapwing and one pochard were observed roosting on the fields backing the beach.

The intertidal area north of the mouth of the Afon Ddu was predominantly utilised by the highest densities of birds. These comprises gulls, oystercatcher and curlew; moderate numbers of feeding redshank and turnstone were also noted. Low numbers of brent geese were also observed here during the January visit and seven eider were observed loafing on the water during the November visit. During the February visit, 400 oystercatcher were noted roosting on the mid-shore.

In the western end, the boating pool and grassed areas surrounding were still used for roosting and loafing however, in much lower numbers than during the high tide surveys. The Afon Ddu, south of the footbridge was utilised by pied wagtail and mallard for feeding and roosting.

Generally, lower densities of birds were observed in the eastern Scheme area, with those observed predominantly limited to the upper shore; these comprised low numbers of gulls, oystercatcher, curlew and a little egret. During the November visit, 50 starling were also noted feeding on the upper shore at the base of the seawall.

In the centre of the Scheme area, low numbers of gulls and oystercatcher were noted roosting on the upper intertidal along with little egret. The mid and low shore was used by limited numbers of birds.

3.1.2 Areas and habitats of value

The notable areas and habitats identified during the surveys include:

- The boating pool and adjacent amenity grassed areas;
- The Afon Ddu;
- Intertidal area north of the mouth of the Afon Ddu; and
- The upper shore in the east and western ends of the Scheme area, areas of mixed substrate and rockpools provide roosting and foraging opportunities.

4 Assessment of site and potential impacts

4.1 Site importance

The surveys were undertaken twice monthly, at the low and high tide from November 2021 to February 2022. These recorded the presence of 27 species within the Scheme area.

The western end of the Scheme area is considered to be of higher value, with the highest densities of birds present on the intertidal area and roosting on the boating pool and adjacent grassed areas. The eastern end provided roosting and feeding opportunities, however, was utilised by significantly less numbers. Lower numbers were observed at high tide, with gulls, oystercatcher and cormorant observed passing through the site however, the boating lake and upper shore in the western end of the Scheme area were utilised for roosting.

In terms of the SPA species, cormorant were present in very low numbers (maximum total count of five birds during the December surveys). They were observed flying over during the November, December and February high tide surveys and one bird was noted feeding at high tide (250m from the seawall) during the January survey.

Curlew were generally observed in low numbers in the western end, feeding out from the mouth of the Afon Ddu. Curlew were present in largest numbers during the December surveys, with a total count of 31 birds which is a low proportion of the number designated under Treath Lafan SPA (1500 birds).

One great-crested grebe was noted during the surveys, feeding out from the centre of the Scheme area approximately 60m from the sea wall during the February high tide survey.

Oystercatcher present in moderate to large numbers throughout the surveys (with the largest observation comprising 400 birds and total of 497 birds during the February low tide survey). Oystercatcher were present in larger numbers (with a total of 497 birds present during the February high-tide survey), though this is still significantly below the 5500 birds listed under the SPA, comprising 9% of the SPA population. They were mostly feeding and roosting on the intertidal area in the western end of the Scheme, located from the upper to the lower shore at the outfall of the Afon Ddu.

4.2 Potential impacts

Construction impacts on birds would likely include the following:

- Disturbance and/or displacement of overwintering birds (noise, light and/or visual); and
- Pollution incidents impacting birds

These could result in the following temporary effects:

- Reduction in species richness and/or abundance of bird species and numbers using areas in close proximity to the works.

5 Recommendations

The Scheme is located in proximity to the following designations:

- Traeth Lafan/ Lafan Sands SPA and SSSI;
- Liverpool Bay SPA;
- Menai Strait and Conwy Bay SAC;
- Aber Afon Conwy SSSI;
- Ynys Seiriol/ Puffin Island SPA (7km NNW); and
- Glannau Penmon – Biwmares SSSI (6km NW).

As a result, a Habitats regulations Assessment (HRA) will be required to assess the significance of any effects on bird species resulting from the works.

Based on the species recorded, it is considered that any mitigation required for SPA species, particularly curlew and redshank (which are prone to disturbance effects) would likely benefit other bird species wintering or on passage through the area.

Given the identified potential impacts above, mitigation measures will need to include best practice construction safeguards as well as specific measures to reduce disturbance to birds including:

- Timing of works:
 - Appropriate tide cycle working i.e. working at mid-low tide only; and
 - Working during daylight hours only, avoiding the need for artificial lighting.
- Deploying an ecological watching brief, to monitor effects during works and with set procedures to pause/restart and stop or reschedule works should adverse effects be observed; and
- Toolbox talks given to all workers to advise on how best to minimise disturbance.

The specific requirements for any mitigation will be defined by the HRA.

Appendices

A. Drawings

B. Full survey results

The surveys for the Scheme were undertaken from November 2021 to February 2022. Results have been set out in the following Tables. SPA designated species are in **bold**.

Table 5.1: Survey Visit 1 – 1st and 2nd November

Species	Distance from sea wall (at closest)	Average count per observation (min, max count)	Field observations
Low tide			
Black-headed gull (<i>Chroicocephalus ridibundus</i>)	0m	5 (1,20)	Predominantly observed roosting on the upper shore throughout the survey area. Four birds were located adjacent to the boating pool. 20 on the intertidal area at the mouth of the Afon Ddu.
Common gull (<i>Larus canus</i>)	40m	2	Two birds roosting at the mouth of the Afon Ddu.
Curlew (<i>Numenius arquata</i>)	40m	1	Feeding in a rock pool on the intertidal area, north of the Afon Ddu.
Eider (<i>Somateria mollissima</i>)	80m	7	Loafing on the intertidal area in the centre of the Scheme area.
Greenshank (<i>Tringa nebularia</i>)	30m	1	Feeding north of the Afon Ddu.
Grey wagtail (<i>Motacilla cinerea</i>)	20m	2	Observed flying west down the river.
Herring gull (<i>Larus argentatus</i>)	0m	5 (1,15)	Predominantly observed roosting, feeding and loafing on the upper shore throughout the survey area. One bird observed loafing on the boating pool.
Lapwing (<i>Vanellus vanellus</i>)	1km	45	All observed roosting on the fields within the Glan y Mor Elias nature reserve.
Lesser black-backed gull (<i>Larus fuscus</i>)	20m	1	Roosting in the end end of the Scheme area.
Little egret (<i>Egretta garzetta</i>)	20m	1	Observed feeding on the upper shore in the centre of the Scheme area.
Mute swan (<i>Cygnus olor</i>)	45m	4 (1,7)	One observed loafing in the pond and a further seven north of Afon Ddu.
Oystercatcher (<i>Haematopus ostralegus</i>)	0m	10 (1,50)	Predominantly feeding throughout the upper-mid intertidal.
Redshank (<i>Tringa totanus</i>)	25m	1	Feeding in a rockpool on the western end of the Scheme area.
Starling (<i>Sturnus vulgaris</i>)	4m	35 (20,50)	50 birds noted feeding on rocks on the upper shore in the eastern end of the survey area. A further 20 observed roosting on the fields in the western end of the survey area within Glan y Mor Elias nature reserve.
High tide			
Black-headed gull (<i>Chroicocephalus ridibundus</i>)	0m	12 (1,40)	40 birds observed roosting on the grass beside the pond. One bird roosting on the seawall in the western end of the Scheme area. Five birds noted flying south.
Cormorant (<i>Phalacrocorax carbo</i>)	20m	1 (1,2)	All observed flying north.

Species	Distance from sea wall (at closest)	Average count per observation (min, max count)	Field observations
Herring gull (<i>Larus argentatus</i>)	50m	13 (3,30)	Three and eight birds observed flying south. 30 were observed flying 1km offshore. 10 birds loafing on the pond.
Mute swan (<i>Cygnus olor</i>)	100m	9	Loafing on the boating pool.
Oystercatcher (<i>Haematopus ostralegus</i>)	0m	25 (1,60)	One observed roosting on the grass by the pond was disturbed by a dog at a distance of 15m. Three flocks of 20 birds were observed flying north.
Redshank (<i>Tringa totanus</i>)	20m	20	Flying north 20m from the seawall.
Rock pipit (<i>Anthus petrosus</i>)	0m	3	Feeding on the upper shore in the eastern Scheme area.
Starling (<i>Sturnus vulgaris</i>)	290m	10	Roosting in a tree adjacent to the listed terraces on the seafront in the western survey area.

Source: Mott MacDonald, 2022

Table 5.2: Survey Visit 2 – 1st and 2nd December

Species	Distance from sea wall	Average count per observation (min, max count)	Field observations
Low tide			
Black-headed gull (<i>Chroicocephalus ridibundus</i>)	10m	83 (10,200)	200 feeding at the low shore in the western Scheme area. 50 feeding and roosting on the upper shore by the Afon Ddu. In the western end, 10 and 40 respectively were feeding on the upper shore.
Curlew (<i>Numenius arquata</i>)	30m	20	Feeding on the upper shore.
Great black-backed gull (<i>Larus marinus</i>)	80m	4 (1,8)	One bird feeding on the mid shore in the western end with a further 8 feeding at the low shore.
Grey heron (<i>Ardea cinera</i>)	60m	1	Flying north-west.
Grey wagtail (<i>Motacilla cinerea</i>)	5m	1	Flying south-east up the Afon Ddu.
Herring gull (<i>Larus argentatus</i>)	10m	180 (60, 300)	300 feeding at the low shore in the western Scheme area. 60 birds roosting on the upper shore by the Afon Ddu and a further 40 feeding on the mid shore. 25 feeding on the upper shore in the eastern end.
Lesser black-backed gull (<i>Larus fuscus</i>)	100m	4 (3,5)	5 birds feeding at the low shore and a further three feeding on the mid shore.
Little egret (<i>Egretta garzetta</i>)	50m	1	Feeding on the upper shore.
Mallard (<i>Anas platyrhynchos</i>)	85m	12	Loafing on the boating pool.
Mute swan (<i>Cygnus olor</i>)	65m	8	Feeding by the boating pool.
Oystercatcher (<i>Haematopus ostralegus</i>)	8m	31 (1,60)	Feeding throughout the intertidal area.
Redshank (<i>Tringa totanus</i>)	35m	30 (20,40)	Feeding on the mid an upper shore.
High tide			
Black-headed gull	15m	30 (8,60)	Rafting on the upper intertidal throughout the survey area. 60 birds observed roosting on the grass adjacent

Species	Distance from sea wall	Average count per observation (min, max count)	Field observations
<i>(Chroicocephalus ridibundus)</i>			to the boating pool and a further 25 roosting on the upper intertidal adjacent to the Afon Ddu.
Brent goose (<i>Branta bernicla</i>)	30m	10	Flying north from the Afon Ddu/ boating pool.
Common gull (<i>Larus canus</i>)	20m	2	Rafting on the upper intertidal in the centre of the survey area.
Cormorant (Phalacrocorax carbo)	30m	5	Observed flying north-west over the survey area.
Curlew (Numenius arquata)	35m	20	Feeding at the mouth of the Afon Ddu.
Dipper (<i>Cinclus cinclus</i>)	10m	1	Feeding in the river mouth south of the foot bridge.
Great black-backed gull (<i>Larus marinus</i>)	65m	2	Roosting on the grass adjacent to the boating pool.
Herring gull (<i>Larus argentatus</i>)	7m	57 (20,150)	90 birds were observed roosting on the grass adjacent to the boating pool. All other birds were rafting on the upper intertidal, occasionally taking flight with the waves.
Lesser black-backed gull (<i>Larus fuscus</i>)	10m	3 (1,4)	Two birds roosting on the grass adjacent to the boating pool. All others were rafting on the upper intertidal, occasionally taking flight with the waves.
Mallard (<i>Anas platyrhynchos</i>)	80m	10	Loafing on the boating pool.
Mute swan (<i>Cygnus olor</i>)	115m	9	Loafing on the boating pool.
Oystercatcher (Haematopus ostralegus)	35m	3 (1,8)	One bird observed flying south. Eight feeding on the upper intertidal on the west side of the Afon Ddu and one roosting on the grass adjacent to the boating pool.
Redshank (<i>Tringa totanus</i>)	10m	7 (4,10)	Observed feeding on the rocks below the seawall.
Rock pipit (<i>Anthus petrosus</i>)	0m	1	Observed feeding on the rocks adjacent to the sea wall at the mouth of the Afon Ddu.
Turnstone (<i>Arenaria interpres</i>)	0m	10	Observed feeding on the rocks adjacent to the sea wall at the mouth of the Afon Ddu.

Source: Mott MacDonald, 2022

Table 5.3: Survey Visit 3 – 13th and 14th January

Species	Distance from sea wall	Average count per observation (min, max count)	Field observations
Low tide			
Black-headed gull (<i>Chroicocephalus ridibundus</i>)	70m	9 (1,30)	Observed roosting throughout the mid shore. 30 were observed roosting on the grass by the boating pool.
Brent goose (<i>Branta bernicla</i>)	105m	2	Roosting on the mid shore out from the Afon Ddu.
Common gull (<i>Larus canus</i>)	95m	2	Roosting on the mid shore.

Species	Distance from sea wall	Average count per observation (min, max count)	Field observations
Curlew (Numenius arquata)	140m	3 (1,5)	Five birds observed roosting at the low shore in the eastern Scheme area. One bird feeding at the low shore out from the Afon Ddu.
Great black-backed gull (<i>Larus marinus</i>)	85m	1	Roosting on the intertidal out from the Afon Ddu at the mid shore.
Herring gull (<i>Larus argentatus</i>)	0m	11 (2,60)	Observed roosting and feeding throughout the intertidal area. The largest density was found at the mouth of the Afon Ddu, with 60 birds roosting and 5 observed flying south.
Lesser black-backed gull (<i>Larus fuscus</i>)	85m	1	Roosting at the mid shore in the centre of the survey area.
Little egret (<i>Egretta garzetta</i>)	30m	1 (1,1)	Feeding on the upper shore in the centre of the survey area.
Mallard (<i>Anas platyrhynchos</i>)	130m	14	Loafing on the boating pool.
Mute swan (<i>Cygnus olor</i>)	170m	7	Seven birds roosting on the grass, disturbed into the boating pool by a dog.
Oystercatcher (Haematopus ostralegus)	8m	24 (1,100)	Feeding and roosting throughout the intertidal area, though in higher densities out from the mouth of the Afon Ddu with 100 birds located at the low shore here. 30 birds were noted flying south-west.
Redshank (<i>Tringa totanus</i>)	85m	10	Observed feeding at the mid shore north of the Afon Ddu.
Turnstone (<i>Arenaria interpres</i>)	90m	16	Feeding at the mid shore north of the Afon Ddu.
High tide			
Black-headed gull (<i>Chroicocephalus ridibundus</i>)	10m	6 (1,12)	One bird feeding on the grass between the Pavilion café and seating shelter, a further 12 were loafing on the boating pool.
Cormorant (Phalacrocorax carbo)	250m	1	Feeding out from the Pavilion car park.
Great black-backed gull (<i>Larus marinus</i>)	20m	1 (1,1)	Two birds observed loafing on the intertidal area, one on the upper shore in the eastern Scheme area and the other at the low shore in the centre of the Scheme area.
Herring gull (<i>Larus argentatus</i>)	200m	2	Loafing on the low shore out from the Pavilion car park.
House sparrow (<i>Passer domesticus</i>)	5m	20	Feeding south of the sea wall.
Lesser black-backed gull (<i>Larus fuscus</i>)	185m	1	Roosting on the low shore out from the Pavilion car park.
Mute swan (<i>Cygnus olor</i>)	80m	8	Feeding on the boating pool.
Oystercatcher (Haematopus ostralegus)	55m	5 (1,8)	Eight birds observed feeding on the upper shore west of the Afon Ddu. A further six noted flying north.
Redshank (<i>Tringa totanus</i>)	90m	4 (5,8)	Five birds feeding and a further three roosting on the upper shore west of the Afon Ddu.

Species	Distance from sea wall	Average count per observation (min, max count)	Field observations
Rock pipit (<i>Anthus petrosus</i>)	0m	1	Feeding on the promenade in the eastern end of the Scheme area.
Turnstone (<i>Arenaria interpres</i>)	50m	15	Roosting on the mid-shore in the western end of the Scheme area.

Source: Mott MacDonald, 2022

Table 5.4: Survey Visit 4 – 8th and 9th February

Species	Distance from sea wall	Average count per observation (min, max count)	Field observations
Low tide			
Black-headed gull (<i>Chroicocephalus ridibundus</i>)	5m	3 (1,8)	Eight birds roosting on the grass by the boating pool. Six birds feeding on the mid shore north of the Afon Ddu. Numerous individuals feeding throughout the upper intertidal with one feeding on the grassed area east of the Pavilion car park.
Curlew (Numenius arquata)	5m	3 (1,7)	Seven birds roosting on the upper shore in the eastern end were noted to be disturbed by a dog. Three birds were feeding on the grass by the boating pool and a further four feeding on the upper shore in the western end.
Great black-backed gull (<i>Larus marinus</i>)	0m	2 (1,4)	One bird observed feeding on the upper shore north of the Pavilion car park. Four birds flying north over the eastern end of the Scheme area.
Herring gull (<i>Larus argentatus</i>)	5m	11 (2,40)	40 birds observed roosting on the upper intertidal west of the mouth of the Afon Ddu. A further 22 were noted roosting and feeding on the upper intertidal north of the Pavilion car park.
Little egret (<i>Egretta garzetta</i>)	10m	1	Feeding amongst the rocks on the upper shore north of Victoria gardens.
Mallard (<i>Anas platyrhynchos</i>)	35m	11 (10,12)	Ten birds loafing up the Afon Ddu, south of the footbridge. 12 birds roosting on the boating pool.
Mute swan (<i>Cygnus olor</i>)	20m	3 (2,6)	On the boating pool, two birds were loafing with six roosting on the waters edge, a further 2 were roosting adjacent to the mouth of the Afon Ddu and two birds were observed flying over.
Oystercatcher (Haematopus ostralegus)	15m	52 (1,400)	400 birds observed roosting on the upper shore north of the Pavilion car park, a further 34 were noted on the grass adjacent to the boating pool. Birds were observed feeding throughout the Scheme area on the upper intertidal.
Pied wagtail (<i>Motacilla alba</i>)	70m	1	Feeding adjacent to the sea wall west of the Afon Ddu.
Redshank (<i>Tringa totanus</i>)	10m	1 (1,2)	All observed feeding on the upper intertidal, two in the centre of the Scheme area and one north-west of the boating pool.
High tide			
Black-headed gull (<i>Chroicocephalus ridibundus</i>)	25m	10 (1,35)	Two birds feeding in Victoria gardens with a further bird feeding on an area of amenity grassland east of the Pavilion car park. Two observed flying west across the upper intertidal. 40 birds were observed roosting at the mouth of the Afon Ddu on the upper shore with a further 30 observed loafing on the boating pool.
Common gull (<i>Larus canus</i>)	30m	1	Observed feeding on the skate park.

Species	Distance from sea wall	Average count per observation (min, max count)	Field observations
Cormorant (<i>Phalacrocorax carbo</i>)	130m	1	Flying north-east.
Curlew (<i>Numenius arquata</i>)	0m	1	Flying south over the eastern end of the Scheme area.
Great black-backed gull (<i>Larus marinus</i>)	20m	1	Loafing on the upper intertidal area.
Great-crested grebe (<i>Podiceps cristatus</i>)	60m	1	Feeding out from the centre of the Scheme area.
Grey heron (<i>Ardea cinerea</i>)	0m	1	Flying west.
Greenfinch (<i>Chloris chloris</i>)	170m	20	Perched on pine trees backing the boating pool.
Herring gull (<i>Larus argentatus</i>)	5m	5 (1,20)	One bird roosting on the roof of the Pavilion café. Three flying west 50m from the seawall. Two loafing on the boating pool. 20 birds flying overhead around the listed buildings west of the boating pool and a further 10 flying over the boating pool itself. 19 birds roosting on the intertidal at the mouth of the Afon Ddu. Two birds rafting on the water 20m from the seawall. One bird feeding in Victoria gardens.
House sparrow (<i>Passer domesticus</i>)	35m	10	Observed perched on a hedge lining a property off Promenade Road in the centre of the Scheme area.
Mallard (<i>Anas platyrhynchos</i>)	45m	8 (5,12)	12 birds observed roosting up the Afon Ddu and a further 5 noted roosting on the western edge of the boating pool.
Mute swan (<i>Cygnus olor</i>)	15m	4 (2,6)	Six birds loafing on the boating pool and a further two observed roosting on the upper intertidal area by the mouth of the Afon Ddu.
Oystercatcher (<i>Haematopus ostralegus</i>)	5m	8 (2,15)	12 birds roosting on the upper shore in the eastern end of the Scheme area. 15 birds roosting on the upper shore adjacent to the west of the Afon Ddu, a further 10 were also roosting further west, north-west of the boating pool. Four birds were also noted flying north-east across the mid intertidal area.
Red-breasted merganser (<i>Mergus serrator</i>)	20m	1	Loafing out from the Pavilion car park.
Redshank (<i>Tringa totanus</i>)	300m	2	Feeding on the upper shore north of the listed buildings in the western end.
Starling (<i>Sturnus vulgaris</i>)	37m	20	Perched on bushes in front of houses in the centre of the Scheme area.
Turnstone (<i>Arenaria interpres</i>)	155m	5	Feeding on the upper intertidal area, north-west of the boating pool.

Source: Mott MacDonald, 2022