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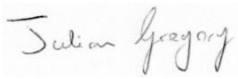
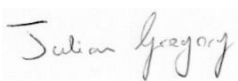
Tywyn CERD

Preliminary Ecological Appraisal



AMCO GIFFEN



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1 TECHNICAL SUMMARY

The summary below is based on the current understanding of the survey remit. Recommendation on future remit are based on best available information on potential future requirements. Further consultation will be required once design recommendation have been made follow the technical assessment and survey being undertaken by AMCO Giffen.

Please refer to Section 5 for legislative context and more detailed description of recommendations.

1.1.1

Table 1: Technical Summary Table

1.1.2

Feature or Species	CERD Survey Remit	Future Remits
Habitat	Limited impact likely during survey stage.	Further surveys dependent of design proposal
Designated Sites	Appropriate Assessment (HRA) and S28G Notice required for survey works. Marine License Band to be determined following consultation with NRW Marine Team.	Hold the Line (HTL) Policy valid until 2125.
Bird Species	Wader species foraging and roosting will be considered within the project HRA.	Dependant on future works remit. E.g., potential for further surveys or timing restrictions.
Common Amphibian and Reptile	Best practice and toolbox talk measures required. Reptiles should be assumed north of the site within the dune systems.	Dependant on future works remit. E.g., potential for further surveys, such as HSI or population surveys.
Common Mammal Species	Impact to badgers unlikely during survey remit.	Large scale works may require further assessment in relation to impacts to potential badger setts, north of the defence line.
Priority Species	Otter, Bottle-nose Dolphin and True Seal recorded within vicinity of defences. Works should work around low tide conditions during the daytime.	Dependant on future works remit. E.g., potential for further surveys or timing restrictions.
Invasive Species	Toolbox talks	Dependant on future works remit.
Aquatic Species	Generation of underwater noise should assessed within the HRA.	Dependant on future works remit.



2 INTRODUCTION

PROJECT BACKGROUND

EcoVigour was instructed by AMCO Giffen Ltd to undertake a Preliminary Ecological Appraisal (PEA) of six Rail Sea Defence Assets as part of the wider Coastal Estuaries River Defences (CERDs) asset appraisal and future design remits. AMCO have been commissioned to assess these six sites and propose future proofing designs to ensure long term resilience of the assets in relation to sea level rise and climate change.

2.1

The fourth site was Tywyn. The study is required to inform AMCO Giffen Ltd of the ecological constraints present, ahead structure assessment, topographical surveys and sampling (bed and structure coring). This report documents the findings of the PEA and will serve as a supporting document to Appropriate Assessments (e.g., TLSE's or HRA's).

2.1.1

2.1.2

The objectives for the survey were:

- ◆ To undertake an ecological assessment of the site;
- ◆ To identify ecological features within the site that could pose a constraint to the proposed development;
- ◆ To identify opportunities for incorporating biodiversity enhancements into the development proposals;
- ◆ To assess the site's potential to support protected species and make recommendations for further survey, where required to clarify potential ecological constraints;
- ◆ To make recommendations for any valuable habitats to be considered, through retention or enhancement, or if this is not possible, by habitat mitigation or compensation;
- ◆ To identify the presence of any invasive non-native species on site.

2.1.3

2.1.4

The ecological report has been prepared in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) guidance document 'Guidelines for Preliminary Ecological Appraisal - Second Edition' (CIEEM, 2017). The objective of the report is to provide a preliminary ecological assessment of the site based on the current design.

2.1.5

An initial ecological overview of the site is provided and potential ecological constraints and impacts of the current proposals are assessed. Recommendations for further surveys are provided where necessary.



SURVEY AREA DESCRIPTION

The survey area concerns the section of sea defence along the west facing shore north of Tywyn, between SH 56761 02528 to SH 57372 01493. Figure 1 below is a copy of the location specification outlined by AMCO Giffen. The compound is to be located on an existing hard north of Twyn Holiday site and also provides vehicle access to the foreshore seaward of the defences.

2.2 Access during the survey was possible during high tide, by approaching the sea defence from the north and passing under rail corridor via a footpath into the dune system.

2.2.1

2.2.2

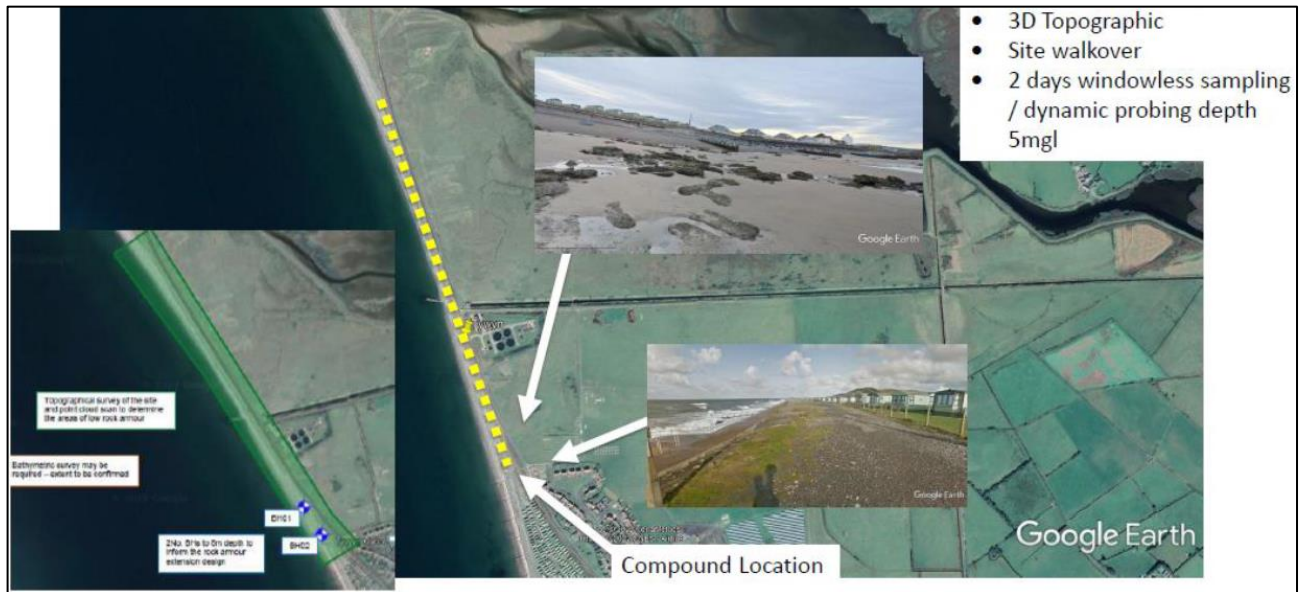


Figure 1: General project layout.

2.3

WORKS REQUIRED

2.3.1

The project is still in the design phase. AMCO Ltd engineers require access for small GI Machine rigs and topographical surveys to confirm the final design. These minor works will broadly involve:

- ◆ Vehicle and Personnel access and movement
- ◆ Temporary Compound setup
- ◆ GI sampling of beach and rail corridor



3 METHODOLOGY

DESK STUDY

A desk study was conducted to assist with the overall site assessment. Statutory and non-statutory designated sites within 2km of the site boundary were identified. Broad habitat boundaries and types were identified from online aerial imagery.

- 3.1 2.1.2. The relevance of the reasons for designation of the protected sites within 2km of the site boundary has been considered during subsequent assessment of whether the proposed works will have any impact upon the biological integrity of such sites.
- 3.1.1

The desk study also included the following sources:

- ◆ Defra's Multi-Agency Geographic Information for the Countryside (MAGIC) website;
- ◆ Online aerial imagery resources;
- ◆ Ancient Woodland Inventory 2011;
- ◆ Natural Resources Wales (NRW);
- ◆ Joint Nature Conservation Committee (JNCC) and
- ◆ A review of OS mapping for waterbodies within 250-500 metres of the site.
- ◆ Cofnod Data Search – Ref: CO/E10320

- 3.1.3 **Note:** Records outlined below are not for the public domain and should not be forwarded to unauthorised third parties. The records below are intended for project purposes only.

3.2 WALKOVER SURVEY

- 3.2.1 The walkover was conducted by Owain Waters an experienced EcoVigour Ltd environmental consultant supported by the Client representative. The survey was conducted using methods outlined in the Joint Nature Conservation Committee (JNCC)'s 'Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit' (JNCC, 2010). The survey consisted of a visual survey of the site, identifying the broad habitat types present, identifying the suitability of the site to support protected and priority species.
- 3.2.2

- 3.2.3 Incidental observations of protected and/or priority species and the potential for such species to occur on site (and in the surrounding landscape where relevant) were also noted, however no specific protected/priority species surveys were undertaken as part of this preliminary ecological assessment.

3.3

- 3.3.1 A search for plant species as included in Schedule 9 of the Wildlife and Countryside Act (1981) as amended, was made during the survey. Under the Act it is an offence to spread, or cause the spread of, these species.

LIMITATIONS

- 3.3.2 Third party biological records do not represent a full species list for the area. The absence of records does not necessarily indicate absence of a species or habitat but rather that these have not been recorded or are perhaps under-recorded within the search area. The results of the survey and assessment undertaken by EcoVigour Ltd are representative at the time of survey.

This document does not contain a comprehensive list of botanical species on site with only plant species characteristic of each habitat and any incidental observations of notable plant species recorded. In addition, many plant species are only evident at certain times of the year; therefore, some plant species may have been undetected. No targeted ecological surveys were undertaken as part of this assessment to determine the presence of specific species.



4 RESULTS

DESIGNATED SITES

There is 5 statutory designated sites within 2km of the site boundary, details are provided in Table 1 below and locations in relation to the project in figure 2.

Table 2: Statutory designated sites within 2km.

Site Name	Designation	Reason for Designation	Distance from Site (km)
Glannau Tonfanau I Friog	Site of Special Scientific Interest (SSSI)	Mixture	1km (North)
Broadwater	Site of Special Scientific Interest (SSSI)	Biological	0km (overlaps 60%)
Dyfi	Site of Special Scientific Interest (SSSI)	Mixture	1.8km (South)
Pen Llyn a'r Sarnau (PLAS)	Special Area of Conservation (SAC)	Mixture	0km (Overlaps 60%)
West Wales Marine	Special Area of Conservation (SAC)		0.1km (west)
Northern Cardigan Bay	Special Protection Area (SPA)	Bird Assemblage and Supporting Habitat	0.2km (west)



Figure 2: Statutory Designated Sites within 2km

The boundary of the SSSI and SAC overlap approximately 60% of the potential working area.

There are also 6 non-statutory designated sites within 2km of the site boundary.



Table 3: Non-statutory sites within 2km.

Site Name	Designation	Reason for Designation	Distance from Site (km)
Glan y don	Wildlife Sites	Mixture	>500m
Sports Ground & Sewage Works	Wildlife Sites	Mixture	1km

None of the Wildlife sites overlaps with the sea defence area or likely project footprints.

ANCIENT WOODLAND

- 4.1.4 There are several Ancient Semi Natural Woodland (ASNW) and Restored Ancient Woodland sites within 1km of the project area. None however are within an impact radius of the works and do not require further assessment at this time.
- 4.2

4.2.1 **WATERBODIES**

- 4.3 From available maps, there are several ponds to the north of the site near Dysynni Bridge (north and south of the Aber Dysynni confluence). These ponds have not been assessed to date.
- 4.3.1



SURVEY FIGURES

The figures below provide a visual summary of the walkover. This is not an extensive collection of the images collected from the survey. Additional images are available upon request.

4.4

4.4.1



Figure 3: Raised rock armour wall above rail corridor with pebble beach seaward.



Figure 4: Tywyn sewage works connected to rhyne.



Figure 5: Rock armour along rail boundary ends 100m north of proposed compound area.



Figure 6: Pioneer dune species observed near rail boundary in more sheltered locations.



Figure 7: Rock armour separate from main defences further seaward of rail corridor.



Figure 8: Proposed compound area, north of holiday caravan park.



COMBINED FIELD SURVEY AND DATA SUMMARY

Habitat: A full updated Phase I survey of the entire survey area has not been undertaken to date, the data set below (Figure 11) is based on available mapping from Cofnod and NRW dataset and should be used as a rudimentary representation of the habitat present.

4.5 Habitat below the sea defence (rock armour) is predominantly, intertidal sand/mud and shingle/gravel habitats above (raised pebble beach). To the south becomes primarily urbanised, while to the north is an extensive dune system.

4.5.1

To the rear of the defences and rail corridor are dune grasslands and salt marsh habitats found within the Broadwater site.

The proposed location for the temporary compound is within an existing gravel hard standing area.

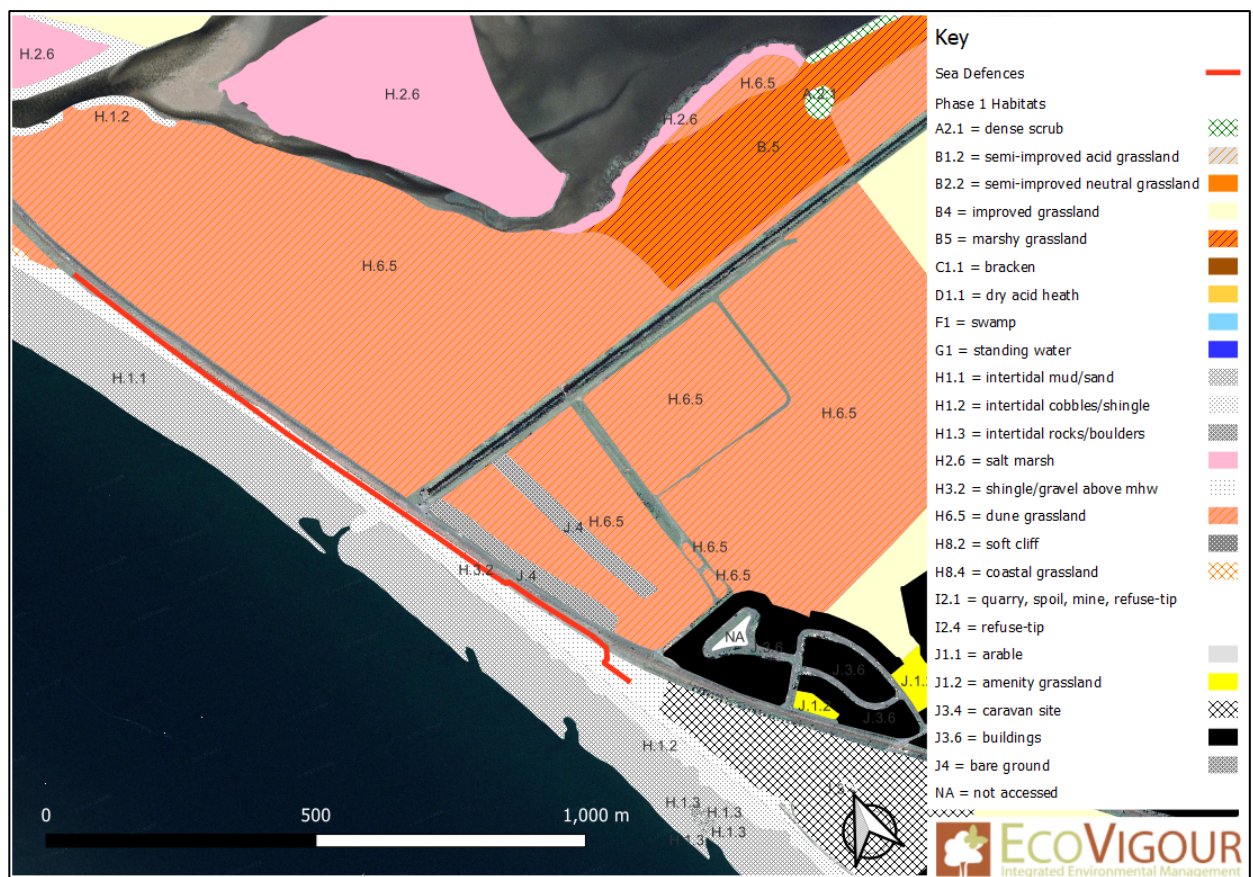


Figure 9: Phase I Habitat Data (Cofnod 2022)



Bird Species - The survey was undertaken during latter portion the traditional bird breeding season (March – August inclusive). Habitat is optimum i.e. surrounding vegetation, sources of fresh water, and elevated areas to perch.

Within the data search, numerous bird records within 2km. In closer proximity to the sea wall, species such as Buzzard, Common Scoter, Curlew, Dunlin, Knot, Lapwing, Meadow Pipit, Merlin, Oystercatcher, Snipe, Wheatear etc. A comprehensive list of bird species can be found within the Appendix.

4.5.2

Meadow pipet were observed within the dune system north of the sea defence.

The raised rock armour landward facing may provide sufficient shelter and protection for local nesting by a variety of local species.

Bat Species - No definitive features pertaining to the presence of bats were identified within the surveyed areas.

4.5.3

Records predominantly originated from the residential areas or the holiday resort to the west. There are no records from the sea wall area of within 250m of either edge of the survey area.

4.5.4

Bats likely forage along the rhine to the rear of the sea wall and broadwater. The rail corridor itself may serve as a flight line between these locations. The sea defence itself appears poor in terms of roosting suitability.



Figure 10: Bat Record Locations in relation to structure.



Common Mammal Species – Species records within Cofnod data set in this region include: Badger, Common Shrew, Hedgehog and Hare. No records originate within 250m of the defence line, however field observation have identified a potential badger sett within the dune system north of the works site, close to the rail corridor and path (see 11 & 12 figure below).

4.5.5



Figure 11: Potential Sett north of sea defences.

No fresh or old latrines were found; however mammal paths were observed within the dense bramble along the rail boundary, suggested relatively consistent activity. It is possible, the setts have been abandoned by badgers and are used by other species, such as fox or rabbit.



Priority Mammal Species – In terms of priority species, Otter, Watervole, Bottle-nosed Dolphin and True Seal have been recorded.

Hazel Dormice have been recorded a significant distance away from the sea defences and the habitat within areas in proximity to the project are suboptimal for this species. Water vole have been recorded along or near the rhyne flowing into the bay. The connected rhyne system has not been surveyed to date, however as those habitats are upstream with little habitat suitability for this species within the project footprint.

4.5.6

Otter are recorded within Broadwater and further upstream in the Afon Dysynni.

Bottle-nosed Dolphin and True Seal are recorded in the bay north and south of the sea defences.

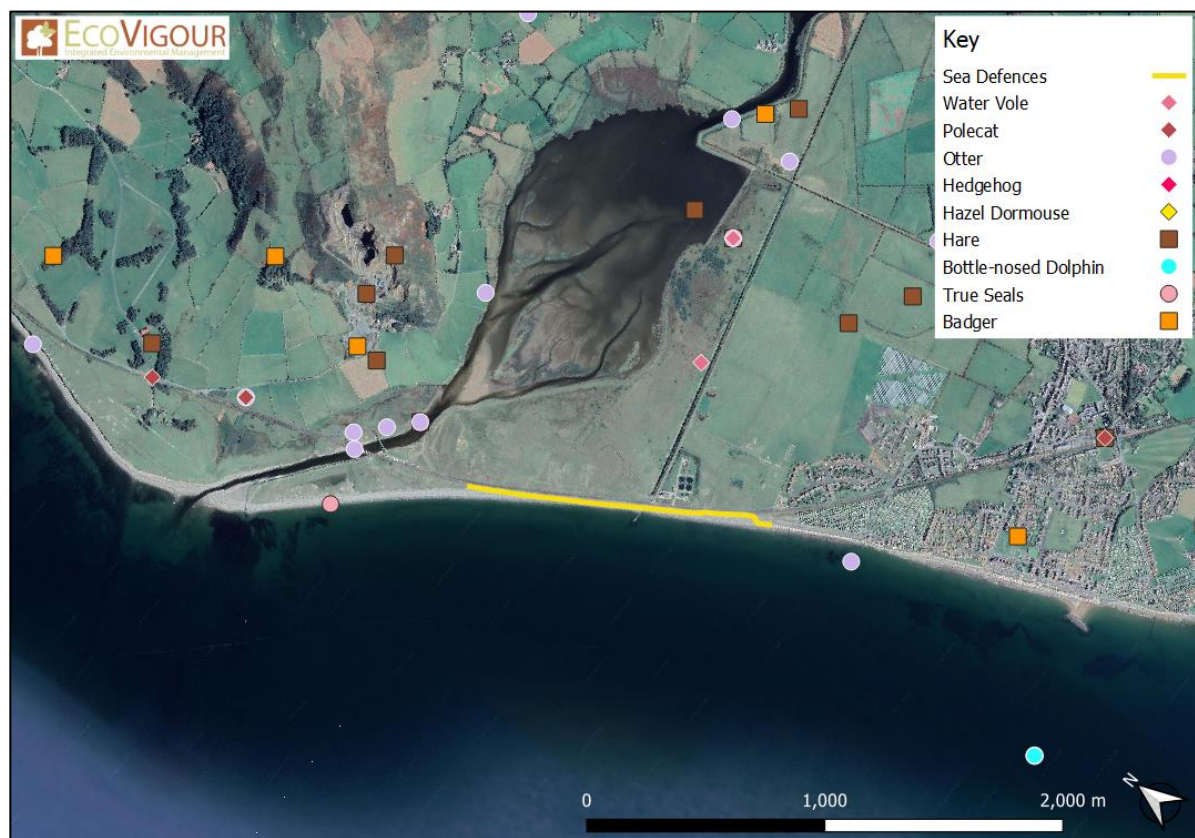


Figure 12: Priority species including Badger, in relation to project.



Common Amphibian and Reptile Species – Common amphibian and reptiles are records appear in relative diversity within the dataset. GCN have been recorded a significant distance inland, while smooth newt have been recorded near the Afon Dysynni confluence. It is possible the ponds noted during the desktop survey are able to support these species, given the proximity of the record.

The dune habitat observed during the walkover north of the sea defence is suitable for reptiles, with several records of Slow Worm noted within this area. The historic manmade structures and rock armour of the sea defence may provide a reptile hibernacula and basking opportunities.

4.5.7



4.5.8

Figure 13: Common Amphibian and Reptile species in proximity to works.

4.5.9

Invasive non-native plant species – No Invasive Non Native Species (INNS) such as Japanese Knotweed or Himalayan balsam have been identified to date within the survey area.

Aquatic Species – Within the available data, there is a diverse range of species record. See Table and Figure below indicating the species and range of recordings.

Table 4: List of recorded fish species.

Latin Name	English Name	Welsh Name
Agonus cataphractus	Hook-nose	Penbwl Môr
Pomatoschistus minutus	Sand Goby	Gobi'r Tywod
Gasterosteus aculeatus	Three-spined Stickleback	Crothell Dri Phigyn
Myoxocephalus scorpius	Bull Rout	Llyffant Môr



5 ASSESSMENT AND RECOMMENDATIONS

This section provides a broad assessment of the information gathered and scopes out potential ecological vectors before remaining considerations and actions are proposed in the following recommendations and opportunities sections below.

5.1 DESIGNATED SITES AND RELIVANT SMP2 UNITS

The proximity of the designated sites necessitates Appropriate Assessments to be undertaken. Special Area of Conservation (SAC) primarily in this instance, however the overlapping SSSI will require S28G Notice and acknowledgement of the SPA further afield.

Pen Llŷn a'r Sarnau/ Lleyn Peninsula and the Sarnau annex features are outlined below:

5.1.1

Annex I habitats that are a primary reason for selection of this site

5.1.2

- ◆ 1110 Sandbanks which are slightly covered by sea water all the time
- ◆ 1130 Estuaries
- ◆ 1150 Coastal lagoons * Priority feature
- ◆ 1160 Large shallow inlets and bays
- ◆ 1170 Reefs

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site

- ◆ 1140 Mudflats and sandflats not covered by seawater at low tide
- ◆ 1310 Salicornia and other annuals colonizing mud and sand
- ◆ 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- ◆ 8330 Submerged or partially submerged sea caves

Annex II species present as a qualifying feature, but not a primary reason for site selection

5.1.3

- ◆ 1349 Bottlenose dolphin *Tursiops truncatus*
- ◆ 1355 Otter *Lutra lutra*
- ◆ 1364 Grey seal *Halichoerus grypus*

5.1.4

As investigatory works are enquired seaward of MHWS, a Marine License will be required. The specific license Band in question will be determined by the NRW Marine License team.

In relation to the Shore Line Management Plan 2 policy units, this section of sea wall is found within 21 - St Ann's Head to Great Ormes Head - Policy Unit 10.17.

Table 5: SMP2 Policies

Policy	Epoch
Hold the line	0 – 20 year policy:
Managed realignment	20 – 50 year policy:
Managed realignment	50 – 100 year policy:



5.2 HABITATS

No vegetation clearance to access the main sea defence structures is envisaged, overall impacts to habitat continuity and quality from survey works is unlikely. However, should substantial remedial measure in the future be required to secure the rail asset, then further impact assessments will be required.

In relation to future repairs, consideration to pioneer dune species close to the rail asset should be made.

- 5.2.1 Should vehicle access through the dune system be required, then further assessment and mitigation measure will be required.

5.3 PROTECTED SPECIES - BATS

5.2.2

- 5.2.3 All British bats and any place used for shelter or protection or breeding site or resting place (their roosts) are fully protected by law under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (as amended).

- 5.3.1 Together these protect bats from:

- ◆ Selling, offering for sale, possessing or transporting for the purpose of the sale or publishing advertisements to buy or sell a protected species.
- ◆ Deliberate, intentional or reckless killing, injury or taking of bats.
- ◆ Damage to or destruction of or, obstruction of access to any place of shelter, breeding (roost) or rest.
- ◆ Disturbance of an animal occupying a structure or place.
- ◆ The deliberate disturbance of any bat species in such a way as to be significantly likely to affect;
 - their ability to survive, hibernate, migrate, breed, or rear or nurture their young; or
 - the local distribution or abundance of that species.

- 5.3.3 No definitive features pertaining to bats have been identified in proximity to the project to date. Bat flight lines and foraging habitat is present further afield, however these are unlikely to be impacted by the current scope of works.

5.4

BADGERS

5.4.1

The Protection of Badgers Act 1992 (as amended) is the main legislation protecting badgers and their habitat in the United Kingdom. Under the Act it is illegal to:-

- ◆ Wilfully kill, injure or take a badger or attempt to do so.
- ◆ Cruelly ill-treat a badger.
- ◆ Interfere with a sett by doing any of the following:
 - (i) damage a badger sett or any part of it,
 - (ii) destroy a badger sett,
 - (iii) obstruct access to a badger sett,
 - (iv) cause a dog to enter a sett,
 - (v) disturb a badger while it is occupying a sett,

No features pertaining to badgers has been confirmed to date, however this species be a component of toolbox talks.



BIRD SPECIES

The Wildlife and Countryside Act 1981 (as amended) is the principal legislation affording protection to UK wild birds. All birds, their nest and eggs are protected by law under this legislation, it is an offence (with certain exceptions), to recklessly or intentionally:

- ◆ Intentionally kill, injure or take any wild bird.
- 5.5 ◆ Intentionally take, damage or destroy the nest of any wild bird while it is in use or being built.
- ◆ Intentionally take or destroy the egg of any wild bird.
- 5.5.1 ◆ Intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

Note: Nesting birds found outside of nesting season are protected by the same level of protection as that within the standard nesting period.

5.5.2 Following best practice, vegetation clearance is required during the main bird breeding season. Any vegetation scheduled to be removed must be checked by an ecologist for active nests no more than 48 hours prior to the start of works.

5.5.3 If nests are present, then a minimum 5m exclusion zone should be established around the nest(s) and no de-vegetation or other heavy machinery work should be carried out within the exclusion zone(s) until it is confirmed that the nest(s) is completed and that the young have fledged.

5.5.4

5.5.5 If nests are present, then a minimum 5m exclusion zone should be established around the nest(s) and no de-vegetation or other heavy machinery work should be carried out within the exclusion zone(s) until it is confirmed that the nest(s) is completed and that the young have fledged.

5.5.6 The site is within proximity to an SPA site with several Schedule 1 species. The contractor must refer to the HRA and any specific conditions outlined by NRW in relation to priority bird species. Ponds to the rear of the sea wall may support the wider bird assembles, primirly wading species.

5.5.7

5.6 Sampling and any remedial works of the rock armour sections near the Sand Martin colony should ideally be undertaken outside of their peak activity (generally April to September). Depending on future requirements, further assessments may be required.

5.6.1

GREAT CRESTED NEWT

As a European Protected Species (EPS), GCN receive full protection under the Wildlife and Countryside Act 1981 (as amended), the 2017 Conservation and Species Regulations (as amended) and the Countryside and Rights of Way Act (CROW) 2000, which make it illegal to:

- ◆ Sell, offer for sale, possess, advertise or transport for the purpose of sale;
- 5.6.2 ◆ Intentionally or deliberately capture, injure or kill GCN;
- ◆ Deliberately disturb GCN;
- ◆ Damage or destroy a breeding site or resting place;
- ◆ Intentionally or recklessly disturb GCN from, or damage, destroy or obstruct access to, a place used for shelter or protection.

As a precaution, this species should feature in toolbox talks, but the likelihood of encountered is considered low.



COMMON REPTILES & AMPHIBIANS

The presence of reptiles and amphibians was not visually confirmed during the ecological assessment (presence or absence surveys have not been undertaken). However, nearby dune habitat and proximity of records dictates that the presence of Reptile species should be assumed.

5.7 All commonly occurring reptile species (common lizard, slow worm, grass snake and adder) are protected by UK law, making it an offence to injure or kill them. Care must be taken to avoid killing or injuring reptiles & amphibians. All commonly occurring reptile species (common lizard, slow worm, grass snake and adder) are protected by UK law, making it an offence to injure or kill them. Care must be taken to avoid killing or injuring reptiles & amphibians. All reptile species are partially protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This legislation protects reptiles from:

5.7.2

- ◆ Reckless or intentional killing and injury.
- ◆ Selling, offering for sale, possessing or transporting for the purpose of the sale or publishing advertisements to buy or sell a protected species.

Where these animals are confirmed as present on land that is to be affected by development, guidance recommends that:

5.7.3

- ◆ The animals should be protected from injury or killing during construction operations;
- ◆ Mitigation should be provided to maintain the conservation status of the species locally.

Precautionary methods to avoid injury or death of reptiles potentially present on site may include:

5.7.4

- ◆ Staged cutting of vegetation. Any vegetation being removed will be strimmed using hand tools to a **height of no less than 150mm and left for 48 hours** so that any animals within can disperse, with no vegetation will be removed below 150mm;
 - ◆ Vegetation removal must be undertaken in a **slow, systematic manner** to allow any animals present to disperse safely away from the site and adjacent suitable habitat;
 - ◆ Dismantling of refugia/hibernacula by hand or carefully by machine and scraping through ballast with a toothed bucket;
 - ◆ If, during the works, a reptile is found, **works will stop (this is a legal requirement)** and the project ecologist will be contacted. To aid accurate species identification, a photograph of the animal should be taken and sent to the project ecologist. The animal (if unharmed) should be allowed to disperse of its own accord;
 - ◆ Works should be undertaken within the reptile active period (March to early October), on warm days, when reptile species are more active and can readily escape any disturbance. If this is not possible due to construction timescales, an ecologist on site will dismantle by hand any hibernation features. Any reptiles discovered in this period should be covered over and remain in situ where possible or moved to a safe place outside of the works area with hibernacula used to shelter them.
- 5.7.5
- ◆ If any injured reptiles are found during the works on site, these will be carefully placed into a clean bucket containing some vegetation and covered over in a quiet place away from the works and an ecologist or local wildlife hospital must be contacted immediately.
- 5.7.6

If any non-protected amphibian species are found during the works, then these will be moved to safety by the supervising ecologist.

Toolbox talks on reptiles should be provided.



OTHER PROTECTED SPECIES

Hedgehogs are protected in England under Schedule 6 of the Wildlife and Countryside Act (1981) and are also listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006). Wales under the Environment (Wales) Act 2016. This species has not been confirmed by is likely present within the wider urban area.

- 5.8 The Wild Mammals Protection Act (1996) makes it an offence to crush or asphyxiate any wild mammal. This may apply during site clearance works, particularly where burrowing mammals such as rabbit and fox are present, as such animals could be crushed or asphyxiated in their burrows by heavy machinery. No features pertaining to common mammals has been identified within the likely access routes or the structure itself.
- 5.8.1
- 5.8.2 If only walking access from the north is required, then no further assessment in relation to the potential setts is required. However, should future works dictate that machines need to use the nearby rail vehicle crossing, then further surveys will be required due to their proximity.

5.8.3

PRIORITY SPECIES IN PROXIMITY TO WORKS

- 5.9 Otter, Bottle-nose Dolphin and True Seal have been recorded within proximity to the structure. Working over water during high tide is unlikely, however works on protected sections of the wall landward of MHWS may occur.
- 5.9.1

- 5.9.2 Consequently, the following precautionary measures are recommended:

- ◆ Where possible, works should be carried out during daylight hours (up to 30 minutes after sunrise and 30 minutes before sunset) where possible, to avoid disturbance to commuting or foraging otters.
 - ◆ Any use of task lighting should be directional to avoid illumination of the river corridor at night. Access for otter along up and down stream of the waterbodies will be maintained during construction.
 - ◆ The principal contractor will nominate a member of the site team to act as a warden. Should an otter been seen within proximity to the works, the warden will request works to be temporarily ceased if safe to do so and allow the animal to move in its preferred position and disperse from the area of its own volition.
 - ◆ Any sightings of otter will be reported to the project environmental coordinator. The principal contractor must ensure that equipment at the lower section of the structure is well secured and not in a fashion that could ensnare or trap otter (or any other animal).
- 5.9.3 ◆ Toolbox talks must be provided to the project team ahead of the works.
- 5.9.4 ◆ The principal contractor must adhere to the Biosecurity Measures outlined within the Marine License documentation and all relevant GPP's.

The Gwynedd Marine Code should be adhered to as much a practically possible.

Water vole and Hazel dormice are unlikely to be encountered during the assessment works. Should future designs require significant changes which could impact the rhyne system, then further assessments may be required.



AQUATIC SPECIES - WORKING NEAR OF IN A WATERCOURSE

All works near the watercourses within the survey area will be conducted in line with industry standard best practice, Guidance for Pollution Prevention (GPPs). This will avoid the risk of polluting the watercourse through chemical contamination or substrate run off. This includes:

- 5.10 ♦ Any chemicals required will be stored in designated places and banded to prevent leakages;
- 5.10.1 ♦ Spill kits will be on site to deal with any leakage of fuel, wet concrete or chemicals;
- ♦ Vehicles will be inspected regularly to identify leaks and fuelling will be carried out off site;
- ♦ On completion of the works the working area will be reinstated on a like-for-like basis.

Toolbox talks can be used to inform personnel undertaking works on the correct site protocol with regards to refuelling and general site behaviour (**i.e. No refuelling on site, all equipment stored on spill nappies, no night works and no materials to be left on site**).

- 5.10.2 Regarding fish spawning periods, the works are scheduled to be completed before the peak winter period and consequently should be able to avoid significant impacts to migrating species. A specific consideration to spawning periods at this section of the Ceredigion Bay should be noted, and will be outlined during the Marine License consultation process by NRW.
- 5.10.3

The potential for underwater noise will be assessed within the HRA.

5.10.4

INVASIVE SPECIES

5.11

- 5.11.1 Schedule 9 invasive species (Japanese Knotweed) of the Wildlife and Countryside Act in England and Wales has been confirmed to be present further downstream of the project. It is an offence to plant or otherwise cause to grow these species in the wild. It can result in fines or imprisonment if the species is spread due to negligence or deliberate intent. Soil or plant material contaminated with non-native and invasive plants can cause ecological damage and must be disposed off-site safely.
- 5.11.2

A Biosecurity Plan will be a component of a Marine License application.



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7 APPENDIX

Table 6: Bird Species List from Cofnod Data.

Scientific Name	English Name	Welsh Name
<i>Alauda arvensis</i>	Skylark	Ehedydd
<i>Chroicocephalus ridibundus</i>	Black-headed Gull	Gwylan Benddu
<i>Falco tinnunculus</i>	Kestrel	Cudyll Coch
<i>Passer domesticus</i>	House Sparrow	Aderyn y To
<i>Sturnus vulgaris</i>	Starling	Drudwen
<i>Charadrius hiaticula</i>	Ringed Plover	Cwtiad Torchog
<i>Emberiza schoeniclus</i>	Reed Bunting	Bras y Cyrs
<i>Gavia immer</i>	Great Northern Diver	Trochydd Mawr
<i>Larus argentatus</i>	Herring Gull	Gwylan y Penwaig
<i>Linaria cannabina</i>	Linnet	Llinos
<i>Milvus milvus</i>	Red Kite	Barcud
<i>Numenius arquata</i>	Curlew	Gylfinir
<i>Numenius phaeopus</i>	Whimbrel	Coegylfinir
<i>Plectrophenax nivalis</i>	Snow Bunting	Bras yr Eira
<i>Pluvialis apricaria</i>	Golden Plover	Cwtiad Aur
<i>Prunella modularis</i>	Duncock	Llwyd y Gwrych
<i>Turdus philomelos</i>	Song Thrush	Bronfraith
<i>Vanellus vanellus</i>	Lapwing	Cornchwiglen
<i>Falco columbarius</i>	Merlin	Cudyll Bach
<i>Hydrocoloeus minutus</i>	Little Gull	Gwylan Fechan
<i>Melanitta nigra</i>	Common Scoter	Mor-Hwyaden Ddu
<i>Turdus pilaris</i>	Fieldfare	Socan Eira
<i>Limosa limosa</i>	Black-tailed Godwit	Rhostog Gynffonddu
<i>Alcedo atthis</i>	Kingfisher	Glas y Dorlan
<i>Falco peregrinus</i>	Peregrine	Hebog Tramor
<i>Troglodytes troglodytes</i>	Wren	Dryw
<i>Pyrrhonorax pyrrhonorax</i>	Chough	Brân Goesgoch
<i>Acanthis cabaret</i>	Lesser Redpoll	
<i>Accipiter gentilis</i>	Goshawk	Gwalch Marthin
<i>Aythya marila</i>	Scaup	Hwyaden Benddu
<i>Branta bernicla</i>	Brent Goose	Gwydd Ddu
<i>Branta bernicla bernicla</i>	Dark-bellied Brent Goose	
<i>Calidris pugnax</i>	Ruff	Pibydd Torchog
<i>Calidris temminckii</i>	Temminck's Stint	Pibydd Temminck
<i>Circus cyaneus</i>	Hen Harrier	Boda Tinwyn
<i>Clangula hyemalis</i>	Long-tailed Duck	Hwyaden Gynffon-Hir
<i>Cygnus cygnus</i>	Whooper Swan	Alarch y Gogledd
<i>Gavia arctica</i>	Black-throated Diver	Trochydd Gyddfddu
<i>Gavia stellata</i>	Red-throated Diver	Trochydd Gyddfgoch
<i>Ichthyaeus melanocephalus</i>	Mediterranean Gull	Gwylan Môr y Canoldir



<i>Jynx torquilla</i>	Wryneck	Pengam
<i>Limosa lapponica</i>	Bar-tailed Godwit	Rhostog Gynffonfraith
<i>Locustella naevia</i>	Grasshopper Warbler	Troellwr Bach
<i>Melanitta fusca</i>	Velvet Scoter	Môr-Hwyaden y Gogledd
<i>Pandion haliaetus</i>	Osprey	Gwalch y Pysgod
<i>Phoenicurus ochruros</i>	Black Redstart	Tingoch Du
<i>Recurvirostra avosetta</i>	Avocet	
<i>Spatula querquedula</i>	Garganey	Hwyaden Addfain
<i>Sternula albifrons</i>	Little Tern	Môr-Wennol Fechan
<i>Tringa nebularia</i>	Greenshank	Pibydd Coeswyrdd
<i>Tringa ochropus</i>	Green Sandpiper	Pibydd Gwyrdd
<i>Turdus iliacus</i>	Redwing	Coch Dan Adain
<i>Calidris maritima</i>	Purple Sandpiper	Pibydd Du
<i>Oceanodroma leucorhoa</i>	Leach's Petrel	Pedryn Cynffon-Fforchog
<i>Botaurus stellaris</i>	Bittern	Aderyn y Bwn
<i>Circus aeruginosus</i>	Marsh Harrier	Boda'r Gwerni
<i>Fringilla montifringilla</i>	Brambling	Pinc y Mynydd
<i>Muscicapa striata</i>	Spotted Flycatcher	Gwybedog Mannog
<i>Passer montanus</i>	Tree Sparrow	Golfan y Mynydd
<i>Puffinus mauretanicus</i>	Balearic Shearwater	
<i>Pyrrhula pyrrhula</i>	Bullfinch	Coch y Berllan
<i>Regulus ignicapilla</i>	Firecrest	Dryw Penfflamgoch
<i>Stercorarius parasiticus</i>	Arctic Skua	Sgiwen y Gogledd
<i>Sterna dougallii</i>	Roseate Tern	Môr-Wennol Wridog
<i>Streptopelia turtur</i>	Turtle Dove	Turtur
<i>Tyto alba</i>	Barn Owl	Tylluan Wen
<i>Calcarius lapponicus</i>	Lapland Bunting	Bras y Gogledd
<i>Chlidonias niger</i>	Black Tern	Cors-Wennol Ddu
<i>Podiceps auritus</i>	Slavonian Grebe	Gwyach Gornio
<i>Ficedula hypoleuca</i>	Pied Flycatcher	Gwybedog Brith
<i>Loxia curvirostra</i>	Crossbill	Gylfingroes
<i>Anthus pratensis</i>	Meadow Pipit	Corhedydd y Waun
<i>Corvus frugilegus</i>	Rook	Ydfran
<i>Motacilla cinerea</i>	Grey Wagtail	Siglen Iwyd
<i>Oenanthe oenanthe</i>	Wheatear	Tinwen y Garn
<i>Phalacrocorax carbo</i>	Cormorant	Mulfran
<i>Apus apus</i>	Swift	Gwennol Ddu
<i>Ardea cinerea</i>	Grey Heron	Crëyr Glas
<i>Calidris alpina</i>	Dunlin	Pibydd y Mawn
<i>Chloris chloris</i>	Greenfinch	Llinos Werdd
<i>Cygnus olor</i>	Mute Swan	Alarch Dof
<i>Delichon urbicum</i>	House Martin	Gwennol y Bondo
<i>Haematopus ostralegus</i>	Oystercatcher	Pioden Fôr
<i>Hirundo rustica</i>	Swallow	Gwennol
<i>Larus canus</i>	Common Gull	Gwylan y Gweunydd
<i>Larus fuscus</i>	Lesser Black-backed Gull	Gwylan Gefnddu Leiaf



Larus marinus	Great Black-backed Gull	Gwylan Gefnddu Fwyaf
Mergus serrator	Red-breasted Merganser	Hwyaden Frongoch
Morus bassanus	Gannet	Hugan
Puffinus puffinus	Manx Shearwater	Aderyn Drycin Manaw
Riparia riparia	Sand Martin	Gwennol y Glennydd
Scolopax rusticola	Woodcock	Cyffyllog
Somateria mollissima	Eider	Hwyaden Fwythblu
Sterna hirundo	Common Tern	Môr-Wennol Gyffredin
Streptopelia decaocto	Collared Dove	Turtur Dorchog
Tadorna tadorna	Shelduck	Hwyaden yr Eithin
Calidris canutus	Knot	Pibydd yr Aber
Gallinago gallinago	Snipe	Giach Cyffredin
Phalacrocorax aristotelis	Shag	Mulfran Werdd
Aythya ferina	Pochard	Hwyaden Bengoch
Anas crecca	Teal	Corhwyaden
Anas platyrhynchos	Mallard	Hwyaden Wylt
Mareca penelope	Wigeon	Chwiwell
Tringa totanus	Redshank	Pibydd Coesgoch
Pluvialis squatarola	Grey Plover	Cwtiad Llwyd
Actitis hypoleucos	Common Sandpiper	Pibydd y Dorlan
Anas acuta	Pintail	Hwyaden Lostfain
Calidris alba	Sanderling	Pibydd y Tywod
Accipiter nisus	Sparrowhawk	Gwalch Glas
Arenaria interpres	Turnstone	Cwtiad y Traeth
Aythya fuligula	Tufted Duck	Hwyaden Gopog
Branta leucopsis	Barnacle Goose	Gwydd Wyran
Bucephala clangula	Goldeneye	Hwyaden Lygad-Aur
Curruca communis	Whitethroat	Llwydfon
Fulica atra	Coot	Cwtiar
Gallinula chloropus	Moorhen	Iar Ddwr
Larus fuscus graellsii	British Lesser Black-Backed Gull	
Larus glaucoides	Iceland Gull	Gwylan yr Arctig
Lymnocyrtus minimus	Jack Snipe	Giach Bach
Mareca strepera	Gadwall	Hwyaden Lwyd
Phoenicurus phoenicurus	Redstart	Tingoch
Phylloscopus trochilus	Willow Warbler	Telwr yr Helyg
Podiceps cristatus	Great Crested Grebe	Gwyach Fawr Gopog
Regulus regulus	Goldcrest	Dryw Eurban
Rissa tridactyla	Kittiwake	Gwylan Goesddu
Spatula clypeata	Shoveler	Hwyaden Lydanbig
Thalasseus sandvicensis	Sandwich Tern	Môr-Wennol Bigddu
Uria aalge	Common Guillemot	Gwylog
Aegithalos caudatus	Long-tailed Tit	Titw Cynffon-Hir
Asio flammeus	Short-eared Owl	Tylluan Glustiog
Cephus grylle	Black Guillemot	Gwylog Ddu
Corvus cornix	Hooded Crow	



<i>Fratercula arctica</i>	Puffin	Pal
<i>Hydrobates pelagicus</i>	Storm Petrel	Pedryn Drycin
<i>Podiceps grisegena</i>	Red-necked Grebe	Gwyach Yddfgoch
<i>Saxicola rubetra</i>	Whinchat	Crec yr Eithin
<i>Stercorarius longicaudus</i>	Long-tailed Skua	Sgiwen Lostfain
<i>Sterna paradisaea</i>	Arctic Tern	Môr-Wennol y Gogledd
<i>Turdus viscivorus</i>	Mistle Thrush	Brych y Coed
<i>Periparus ater</i>	Coal Tit	Titw Penddu
<i>Anthus spinoletta</i>	Water Pipit	Corhedydd y Dwr
<i>Sylvia borin</i>	Garden Warbler	Telwr yr Ardd
<i>Saxicola rubicola</i>	Stonechat	Clochdar y Cerrig
<i>Motacilla alba</i>	Pied/White Wagtail	Siglen Fraith/Wen
<i>Motacilla alba yarrellii</i>	Pied Wagtail	Siglen Fraith
<i>Corvus corax</i>	Raven	Cigfran
<i>Acrocephalus scirpaceus</i>	Reed Warbler	Telwr y Cyrs
<i>Alca torda</i>	Razorbill	Llurs
<i>Carduelis carduelis</i>	Goldfinch	Nico
<i>Cyanistes caeruleus</i>	Blue Tit	Titw Tomos Las
<i>Motacilla alba alba</i>	White Wagtail	Siglen Wen
<i>Parus major</i>	Great Tit	Titw Mawr
<i>Buteo buteo</i>	Buzzard	Bwncath
<i>Egretta garzetta</i>	Little Egret	Crëyr Bach
<i>Mergus merganser</i>	Goosander	Hwyaden Ddanheddog
<i>Acrocephalus schoenobaenus</i>	Sedge Warbler	Telwr yr Hesg
<i>Anser anser</i>	Greylag Goose	Gwydd Wylt
<i>Anthus petrosus</i>	Rock Pipit	Corhedydd y Graig
<i>Branta bernicla hrota</i>	Light-bellied Brent Goose	
<i>Calidris ferruginea</i>	Curlew Sandpiper	Pibydd Cambig
<i>Calidris minuta</i>	Little Stint	Pibydd Bach
<i>Columba palumbus</i>	Woodpigeon	Ysguthan
<i>Fulmarus glacialis</i>	Fulmar	Aderyn Drycin y Graig
<i>Rallus aquaticus</i>	Water Rail	Rhegen Ddwr
<i>Columba oenas</i>	Stock Dove	Colomen Wylt
<i>Curruca curruca</i>	Lesser Whitethroat	Llwydfron Fach
<i>Dendrocopos major</i>	Great Spotted Woodpecker	Cnocell Fraith Fwyaf
<i>Phylloscopus collybita</i>	Chiffchaff	Siff-Siaff
<i>Stercorarius skua</i>	Great Skua	Sgiwen Fawr
<i>Sylvia atricapilla</i>	Blackcap	Telwr Penddu
<i>Phylloscopus inornatus</i>	Yellow-browed Warbler	Telwr Aelfelyn
<i>Bubulcus ibis</i>	Cattle Egret	Crëyr y Gwartheg
<i>Sitta europaea</i>	Nuthatch	Delwr y Cnau
<i>Spinus spinus</i>	Siskin	Pila Gwyrdd
<i>Ardea alba</i>	Great White Egret	Crëyr Mawr Gwyn
<i>Certhia familiaris</i>	Treecreeper	Dringwr Bach
<i>Chloris chloris chloris</i>		
<i>Branta canadensis</i>	Canada Goose	Gwydd Canada



Alopochen aegyptiaca	Egyptian Goose	Gwydd yr Aifft
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