

---

**Site Preparation and Clearance  
Environmental Statement  
Volume 3 – Appendix 14-06  
Consultancy Report: A Baseline  
Assessment of the Bryophytes of Key  
Habitats within the Wylfa NPS Site**

---

[This page is intentionally blank]



## **Wylfa Newydd Project**

### **Consultancy Report: A Baseline Assessment of the Bryophytes of Key Habitats within the Wylfa Study Area**

**November 2014**

**Mark Jackson**

**Document Number: 60PO8007/TER/REP/004  
Horizon Ref: WN03.01.01-S5-PAC-REP-00010  
Document Date: December 2015  
Version: 3**

## Document control sheet

BPP 04 F8  
version 16 Oct 2013

<b>Project:</b>	Wylfa Newydd Project		
<b>Client:</b>	Horizon Nuclear Power Ltd.	<b>Project Number:</b>	60PO8007
<b>Document Title:</b>	A baseline assessment of the bryophytes of key areas within the Wylfa study area		
<b>Ref. No:</b>	60PO8007/TER/REP/004		

		<b>Originated by</b>	<b>Checked by</b>	<b>Reviewed by</b>
<b>ORIGINAL</b>		NAME <b>Mark Jackson</b>	NAME <b>Jonathan Jackson</b>	NAME <b>Adrian Hutchings</b>
<b>Approved by</b>		NAME <b>Rob Bromley</b>	As Project Manager I confirm that the above document(s) have been subjected to Jacobs' Check and Review procedure and that I approve them for issue	INITIALS 
DATE	12/12/14	Document status: Final		

		NAME	NAME	NAME
<b>REVISION</b>		<b>Mark Jackson</b>	<b>Jonathan Jackson</b>	<b>Nick Clark</b>
<b>Approved by</b>		NAME <b>Rob Bromley</b>	As Project Manager I confirm that the above document(s) have been subjected to Jacobs' Check and Review procedure and that I approve them for issue	INITIALS 
DATE	16/10/15	Document status: Final		

		NAME	NAME	NAME
<b>REVISION</b>		<b>Suzanne Jenkins</b>	<b>Jonathan Jackson</b>	
<b>Approved by</b>		NAME <b>Rob Bromley</b>	As Project Manager I confirm that the above document(s) have been subjected to Jacobs' Check and Review procedure and that I approve them for issue	INITIALS 
DATE	16/12/15	Document status: Final		

### Jacobs U.K. Limited

This document has been prepared by a division, subsidiary or affiliate of Jacobs U.K. Limited ("Jacobs") in its professional capacity as consultants in accordance with the terms and conditions of Jacobs' contract with the commissioning party (the "Client"). Regard should be had to those terms and conditions when considering and/or placing any reliance on this document. No part of this document may be copied or reproduced by any means without prior written permission from Jacobs. If you have received this document in error, please destroy all copies in your possession or control and notify Jacobs.

Any advice, opinions, or recommendations within this document (a) should be read and relied upon only in the context of the document as a whole; (b) do not, in any way, purport to include any manner of legal advice or opinion; (c) are based upon the information made available to Jacobs at the date of this document and on current UK standards, codes, technology and construction practices as at the date of this document. It should be noted and it is expressly stated that no independent verification of any of the documents or information supplied to Jacobs has been made. No liability is accepted by Jacobs for any use of this document, other than for the purposes for which it was originally prepared and provided. Following final delivery of this document to the Client, Jacobs will have no further obligations or duty to advise the Client on any matters, including development affecting the information or advice provided in this document.

This document has been prepared for the exclusive use of the Client and unless otherwise agreed in writing by Jacobs, no other party may use, make use of or rely on the contents of this document. Should the Client wish to release this document to a third party, Jacobs may, at its discretion, agree to such release provided that (a) Jacobs' written agreement is obtained prior to such release; and (b) by release of the document to the third party, that third party does not acquire any rights, contractual or otherwise, whatsoever against Jacobs and Jacobs, accordingly, assume no duties, liabilities or obligations to that third party; and (c) Jacobs accepts no responsibility for any loss or damage incurred by the Client or for any conflict of Jacobs' interests arising out of the Client's release of this document to the third party.

## Executive Summary

Horizon Nuclear Power Wylfa Ltd. (Horizon) is currently planning to develop a new nuclear power station on Anglesey (the Wylfa Newydd Generating Station) as identified in the National Policy Statement for Nuclear Power Generation (EN-6). The Wylfa Newydd Project (the Project) will require a number of applications to be made under different legislation to different regulators. Jacobs UK Ltd (Jacobs) was commissioned to collect baseline data to inform the various applications, assessments and permits that will be submitted for approval to construct and operate the Wylfa Newydd Generating Station.

This report details the methods and findings of a bryophyte survey that was undertaken as part of this work. The survey work concentrated on the habitats that were thought to be more significant for bryophytes based on the experience of the surveyors and information provided by a Phase 1 habitat survey. These habitats included:

- rocky outcrops;
- stone walls;
- mire systems;
- trees;
- heathland;
- arable fields;
- watercourses;
- wet seepage zones;
- the upper shore rocks and coastal grassland interface;
- in-stream rocks in watercourses;
- bare earth on banksides of watercourses;
- bark of sallow carr; and
- bark of other broadleaved trees.

In total, 126 species were found during the survey, with an additional eight species recorded during other ecological surveys in 2013/14. No nationally notable species were found, but 11 species that are considered to be rare on Anglesey were identified.

The number of bryophyte species found during the survey was considered to be typical for an area of land the size of the study area. This was largely due to the number of micro-habitat types present. The species composition was also considered to be typical for the habitat types present.

The surveys showed that the coastal habitats are ecologically more important for bryophytes due to the diversity of species and assemblages associated with this zone. This habitat type had a low percentage coverage compared to the size of the study area as a whole. The dominant habitat type is improved agricultural land. The best habitats for bryophytes in the study area were therefore among the least abundant.

## Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	Overview	1
1.2	Wylfa Newydd Project	1
1.3	Site Description	1
1.4	Study Aims and Objectives	4
1.5	Previous Work	4
<b>2</b>	<b>Methodology</b>	<b>5</b>
2.1	Desktop Study	5
2.2	Survey Methodology	5
2.3	Glossary of Terms	7
2.4	Notable Species and Species of Principal Importance	7
2.5	Limitations	7
<b>3</b>	<b>Results</b>	<b>9</b>
3.1	Desktop Study	9
3.2	Field Survey	9
3.3	Summary of Results	19
<b>4</b>	<b>Discussion</b>	<b>21</b>
<b>5</b>	<b>Conclusions</b>	<b>23</b>
<b>6</b>	<b>References</b>	<b>24</b>
<b>Appendix A Incidental Species List</b>		<b>25</b>
<b>Appendix B Species List Recorded by Survey Site</b>		<b>27</b>
<b>Appendix C Species List Recorded by Taxon</b>		<b>44</b>

## 1 Introduction

### 1.1 Overview

Horizon Nuclear Power Wylfa Ltd. (Horizon) is currently planning to develop a new nuclear power station on Anglesey as identified in the National Policy Statement for Nuclear Power Generation (EN-6). The Wylfa Newydd Project (the Project) comprises the proposed new nuclear power station (the Wylfa Newydd Generating Station), including the reactors, associated plant and ancillary structures and features, together with all of the development needed to support its delivery, such as highway improvements, worker accommodation and specialist training facilities. The Project will require a number of applications to be made under different legislation to different regulators. As a nationally significant infrastructure project under the Planning Act 2008, the construction and operation must be authorised by a development consent order.

Jacobs UK Ltd (Jacobs) was commissioned by Horizon to undertake a full ecological survey programme within the vicinity of the Power Station Site. This work has included the gathering of baseline data to inform the various applications, assessments and permits that will be submitted for approval to construct and operate the Power Station and Associated Development.

This report details the findings of a baseline survey of bryophytes undertaken on weeks beginning September 12<sup>th</sup> and 19<sup>th</sup> 2014.

The study area is shown in figure 1 and the areas surveyed in figure 2.

### 1.2 Wylfa Newydd Project

The Project includes the Wylfa Newydd Generating Station and Associated Development<sup>1</sup>. The Wylfa Newydd Generating Station includes two UK Advanced Boiling Water Reactors to be supplied by Hitachi-GE Nuclear Energy Ltd, associated plant and ancillary structures and features. In addition to the reactors, development on the Power Station Site (the indicative area of land and sea within which the majority of the permanent Wylfa Newydd Generating Station buildings, plant and structures would be situated) will include steam turbines, control and service buildings, operational plant, radioactive waste storage buildings, ancillary structures, offices and coastal developments. The coastal developments will include a Cooling Water System (CWS) and breakwater, and a Marine Off-Loading Facility (MOLF).

### 1.3 Site Description

The Wylfa Newydd Development Area (the indicative areas of land and sea, including the Power Station Site, the Wylfa NPS Site<sup>2</sup> and the surrounding areas that would be used for the construction and operation of the Wylfa Newydd Generating Station) covers an area of approximately 380ha. It is bounded to the

<sup>1</sup> Development needed to support delivery of the Wylfa Newydd Generating Station is referred to as Associated Development. This includes highway improvements along the A5025, park and ride facilities for construction workers, Logistics Centre, Temporary Workers' Accommodation, specialist training facilities, Horizon's Visitor Centre and media briefing facilities.

<sup>2</sup> The site identified on Anglesey by the National Policy Statement for Energy EN-6/NPS EN-6 as potentially suitable for the deployment of a new nuclear power station.

north by the coast and the Existing Power Station. To the east, it is separated from Cemaes by a narrow corridor of agricultural land. The A5025 and residential properties define part of the south-east boundary, with a small parcel of land spanning the road to the north-east of Tregele. To the south and west, the Wylfa Newydd Development Area abuts agricultural land, and to the west it adjoins the coastal hinterland.

The Wylfa Newydd Development Area includes the headland south of Wylfa Head candidate Wildlife Site. There is one designated site for nature conservation within the Wylfa Newydd Development Area; Tre'r Gof Site of Special Scientific Interest (SSSI). It is also within 1km of the Cae Gwyn SSSI, Cemlyn Bay Special Area of Conservation (SAC) and SSSI, and the Ynys Feurig, the Skerries and Cemlyn Bay Special Protection Area (SPA).

Tre'r Gof SSSI is a small basin mire adjacent to the Existing Power Station, west of Cemaes. The area receives mineral-enriched waters from the surrounding boulder clay leading to the development of notable flora. It is the botanical interest that provides the reason for the designation of the site as a SSSI.

Cae Gwyn SSSI is located immediately to the south of the Wylfa Newydd Development Area to the west of Llanfechell. The SSSI comprises two wetland areas separated by an outcrop of rock with heathland vegetation. The southern wetland is confined by a rock basin and is dominated by bogmoss (*Sphagnum* spp.) and a wide variety of common wetland herbs. The northern wetland has a different flora containing denser areas of willow (*Salix* spp.) and common reed (*Phragmites communis*).

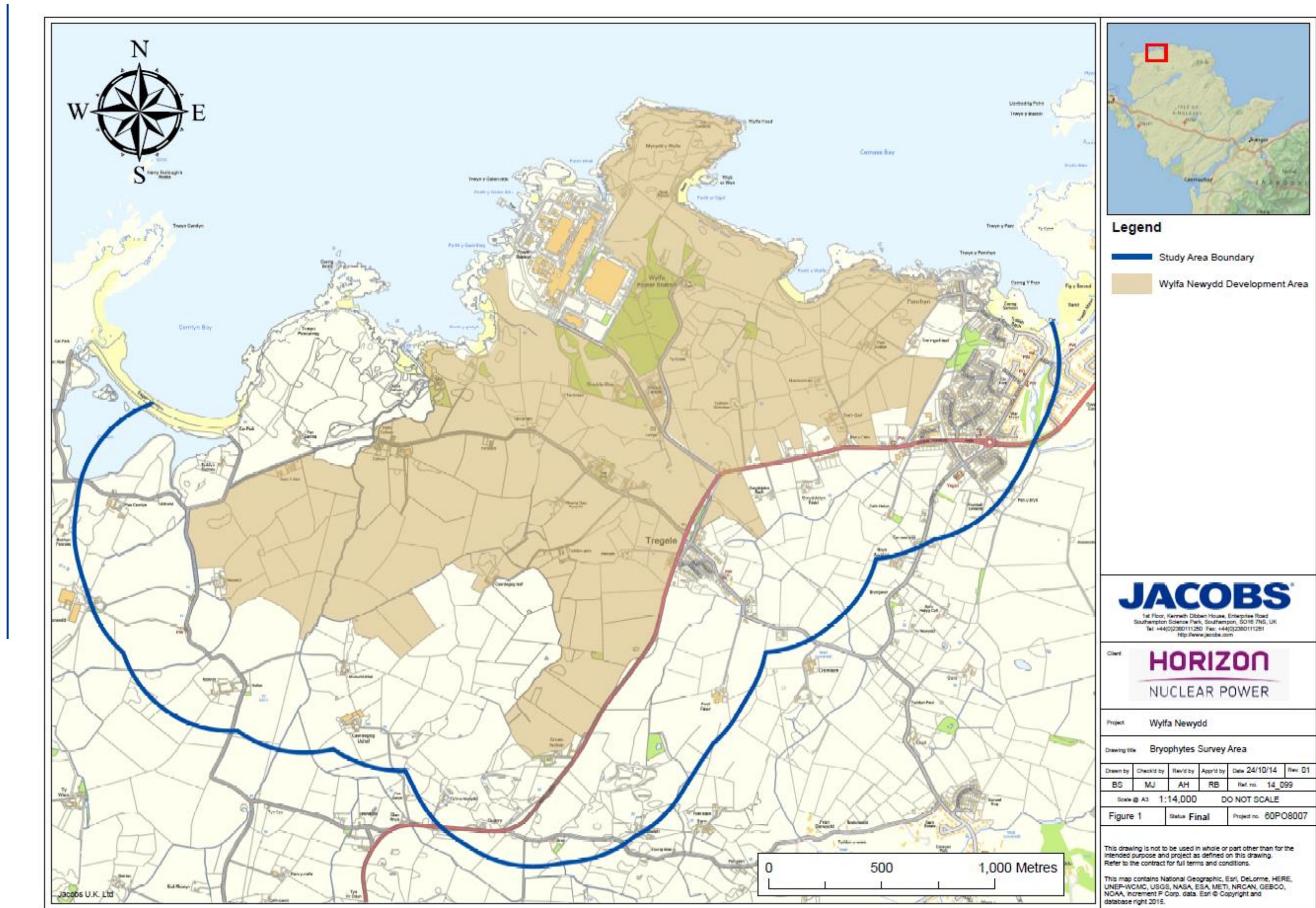


Figure 1: The study area

## 1.4 Study Aims and Objectives

The objective of the bryophyte survey was to characterise the environment and collect baseline data to inform the range of applications, assessments and permits required to construct and operate the Wylfa Newydd Generating Station.

As part of the Environmental Impact Assessment (EIA) the need for detailed knowledge of temporal and spatial data on bryophytes was identified. This report presents the findings of work undertaken in 2014. This included an assessment of the relative diversity of the bryophyte flora found during the survey within the study area. The survey primarily focussed on the potentially richer bryophyte habitats present in the study area.

## 1.5 Previous Work

In 2012 Arup produced a Lower Plant Appraisal Report that included a search within and around the Power Station Site for moss, liverwort and lichen species (Arup, 2012). This included searching the following habitats that were considered more likely to support notable species:

- fen – six common species recorded;
- coastal heathland/grassland – six common species recorded;
- rocky outcrops – no moss species recorded;
- stone walls – no moss species recorded; and
- broadleaved trees – no moss species recorded.

This survey is considered to provide only a very basic level of understanding of the bryophyte assemblages present in the study area and hence the requirement for additional more detailed survey work was identified.

## 2 Methodology

### 2.1 Desktop Study

A request for all records of bryophytes within 2km of the centre of the study area was made to the North Wales Environmental Information Service (Cofnod). These data were reviewed and discussed in the context of the habitats present within the study area and the notable species they are likely to support.

A review of all incidental records from the National Vegetation Classification (NVC), freshwater macrophyte and Phase 1 survey reports undertaken by Jacobs was also completed.

### 2.2 Survey Methodology

The study area included both the Wylfa Newydd Development Area and a 500m buffer around the boundary. The purpose of the 500m buffer being included in the study area was so that the results from within the development area could be compared to other similar sites nearby. This would provide a greater degree of confidence in the results and more context for the conclusions. It is also considered that some areas within the 500m buffer could be used for mitigation in the future and so information on the existing conditions could prove useful.

The 2013 Phase 1 habitat survey maps and habitat descriptions were used to identify those areas with a higher likelihood of supporting bryophytes. These habitats included:

- rocky outcrops;
- stone walls;
- mire systems;
- trees;
- heathland;
- arable fields;
- watercourses;
- wet seepage zones;
- the upper shore rocks and coastal grassland interface;
- in-stream rocks in watercourses;
- bare earth on banksides of watercourses;
- bark of sallow carr; and
- bark of other broadleaved trees.

The study areas selected and the specific survey sites with these habitats present are shown in figure 2.

The method used for the bryophyte survey was to search, find and identify any species present. Some species were readily identified in the field, but many others were collected for later identification and verification. These were later examined using a 20x magnification hand lens or by stereo light microscope up to 400x magnification.

Identification references used include:

Atherton I., Bosanquet S. & Lawley M., (2010), *Mosses and Liverworts of Britain and Ireland a field guide*, British Bryological Society.

Smith A.J.E., (1996), *The Liverworts of Britain and Ireland*, Cambridge University Press.

Smith A.J.E., (1996), *The Moss Flora of Britain and Ireland*, Cambridge University Press.

## 2.3 Glossary of Terms

Given below is a list of terms used in this report.

**Acrocarpous** – This term relates to mosses that have clustered upright stems with reproductive parts borne at the tip of the stems from a central rosette of leaves.

**Hornwort** – Hornworts are a group of bryophytes. The common name refers to the reproductive horn-like structure which emerges from the flattened green thallus.

**Pleurocarpous** – This term relates to mosses that have mainly horizontal trailing stems and reproductive parts borne laterally from the stem.

**Sallow carr** – This term applies to wet woodland dominated by willow *Salix* spp.

**Thallus (thalloid)** – The main vegetative part of a liverwort – leafy liverworts do not have a thallus but have leaves similar to a moss.

**Sphagnum** – A type of moss that is associated with wet habitats and is responsible for the development of peat.

**Saxicolous** – Growing on and associated with rocks.

## 2.4 Notable Species and Species of Principal Importance

Notable species were those that are considered to be rare on Anglesey, i.e. have only been recorded in one or two 10km squares and those considered to be ‘local’ on Anglesey, i.e. only recorded in approximately three to eight 10km squares (Hill et al., 1994).

There are 53 bryophyte species of principal importance listed under Section 42 of the Natural Environment and Rural Communities Act 2006, which are material considerations in the planning process.

## 2.5 Limitations

During the survey the weather was extremely dry. This resulted in the majority of the bryophytes being desiccated and thereby difficult to identify. In addition most species encountered were also not showing fertile structures, which, in some genera, are important diagnostic features used in identification. As a result approximately 12 specimens were not identified to species level. This is not thought to have significantly altered the conclusions of the survey.

The survey sampling method scoped out areas that were considered to have a lower likelihood of supporting notable bryophyte species. As a result there is the potential for notable bryophyte species, or areas of importance for bryophytes, to have been missed by the survey. However, this is considered to be unlikely given the predominance of habitats of very restricted botanical diversity i.e. agriculturally improved grassland. Any discoveries of either individual species or small areas of bryophyte interest in the future are therefore unlikely but not impossible. This is not considered to significantly alter the conclusions of this report.

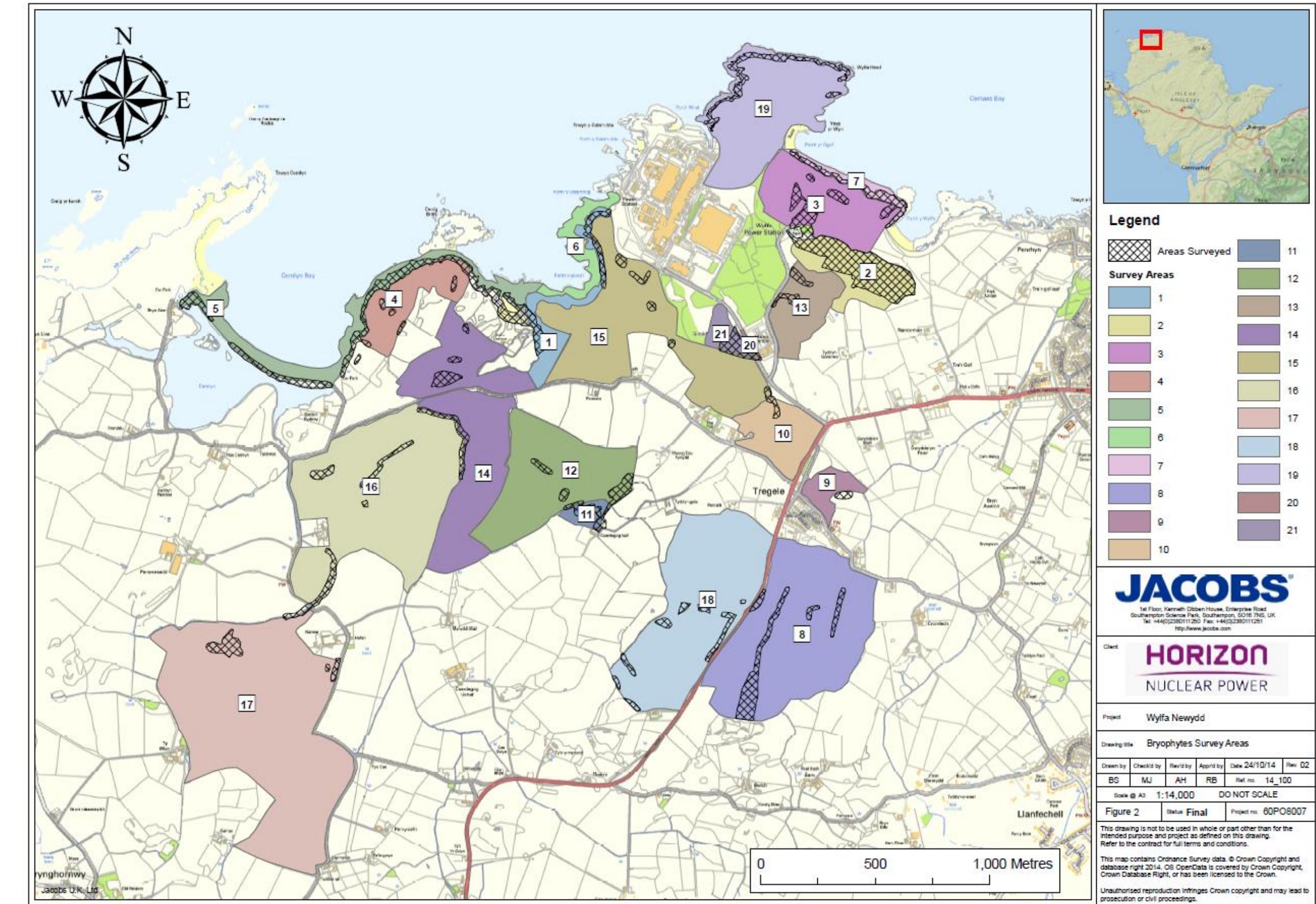


Figure 2: Bryophyte survey areas and specific habitats surveyed

## 3 Results

### 3.1 Desktop Study

The data provided by Cofnod included 42 records of 32 bryophyte species found at five sites in the local vicinity of the Existing Power Station. However, only three of these sites are in close proximity or inside the study area (see table 1). Only one species was recorded as notable (*Calliergon cordifolium*) as it has been found in less than ten 1km squares on Anglesey. This species was also recorded during the current field survey.

**Table 1: Cofnod data search results**

Species	Site	Grid Ref	Date
<i>Brachythecium rutabulum</i>	Tre'r Gof	SH358936	01/08/1983
<i>Calliergon cordifolium</i> *	Tre'r Gof	SH358936	01/08/1983
<i>Calliergonella cuspidata</i>	Tre'r Gof	SH358936	01/08/1983
<i>Fissidens adianthoides</i>	Tre'r Gof	SH358936	01/08/1983
<i>Mnium hornum</i>	Tre'r Gof	SH358936	01/08/1983
<i>Sphagnum subnitens</i>	Tre'r Gof	SH358936	01/08/1983
<i>Brachythecium albicans</i>	Cemlyn Bay	SH331932	06/06/1989 - 2007
<i>Homalothecium lutescens</i>	Cemlyn Bay	SH331932	06/06/1989 - 2007
<i>Hypnum cupressiforme</i>	Cemlyn Bay	SH331932	06/06/1989 - 2007
<i>Eurhynchium praelongum</i>	Cemlyn Bay	SH331932	06/06/1989
<i>Homalothecium sericeum</i>	Cemlyn	SH3393	2007
<i>Weissia personii</i>	Wylfa Head	SH3594	1986

\* Notable

Appendix A gives the list of incidental species recorded in other survey reports by Jacobs.

A review of the species incidentally recorded during the NVC and macrophyte surveys found that 26 species had previously been recorded in the study area. Four of these species were notable, all of which were recorded during this field survey. Eight species were recorded during the NVC and macrophyte surveys that were not recorded during the current field surveys. These were all non-notable common and widespread species of low significance and are considered not to fundamentally alter the conclusions of this survey.

### 3.2 Field Survey

#### 3.2.1 Overview

A total of 126 species of bryophyte were recorded during the survey. This included 22 species of leafy liverwort, eight species of thallous liverwort, two species of hornwort, three species of sphagnum moss, 61 species of acrocarpous moss and 30 species of pleurocarpous moss. The survey refound 18 of the 26 species that had previously been recorded (see above), and failed to find eight previously recorded species. The total number of species found within the study area is therefore currently 134.

None of the bryophyte species found during the survey are listed in accordance with the requirements of Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006 or are listed in the revised red data list of bryophytes in Britain (Hodgetts, 2011). There were also no bryophyte species listed under any rarity categories established by the International Union for Conservation of Nature (IUCN).

However, eleven species are considered to be rare on Anglesey (Hill *et al.*, 1994). These include two leafy liverworts, fragrant crestwort (*Lophocolea fragrans*) and dwarf flapwort (*Jungermannia pumila*); one species of thallous liverwort, blueish veilwort (*Metzgeria fruticulosa*); a species of hornwort, dotted hornwort (*Anthoceros punctatus*); six species of acrocarpous mosses, blunt-fruited Pottia (*Tortula modica*), Hartman's grimmia (*Grimmia hartmanii*), curve-leaved ditrichum (*Ditrichum heteromallum*), marsh forklet-moss (*Dichodontium palustre*), tufted thread moss (*Bryum caespiticium*) and spreading earth moss (*Aphanorhynchma patens*); and one species of pleurocarpous moss, megapolitan feather-moss (*Rhynchostegium megapolitanum*).

A further 34 species were considered to be notable, as they are only found as localised populations and therefore sparsely distributed across Anglesey (Hill *et al.*, 1994).

Several sites in the study area accommodated at least one or more of these notable species. The numbers of notable species found at each site are given in table 2, which rank the sites according to the number of notable species present (then total number of species), and appendix B lists the species recorded at each site.

**Table 2: Total Species and Notable species recorded for each site surveyed.**

Site Ref	Site Name	Total number of species	Notable species
1	Cestyll gardens	35	8
5	Cemlyn Bay and the Coast adjacent to Pencarreg Heath	50	6
16	Farmland south-west and south-east of Swn-y-mor	29	5
14	South of Trwyn Pencarreg	26	5
19	Wylfa Head	26	5
2	Tre'r Gof SSSI	29	4
7	Coastal strip west of Porth Wylfa	24	4
6	Coast at Porth-y-pistyll	21	4
3	Wylfa Manor and fields north of Tre'r Gof SSSI	25	3
15	South-west of Power Station	32	2
11	Field north of Caerdegog Isaf	19	2
12	Farmland south of Cafnan	6	2
13	South of Tre'r Gof SSSI	20	1
8	Farmland at Foel Fawr south of Tregele	15	1
10	Fields south of Wylfa Information Centre	9	1
4	Trwyn Pencarreg Heath	8	0
9	Fields at Tregele	8	0
17	Farmland south, south-west and west of Nanner	25	0
18	Farmland north of Groes Fechan	22	0
20	Wylfa Information Centre – bank by road	5	0
21	Wylfa Social Club	21	0

### 3.2.2 Cestyll Gardens – Site 1

Cestyll Gardens is a landscaped memorial garden situated either side of the Porth-y-Felin stream that had eroded a small gorge through the bedrock. A mixture of mostly non-native trees and garden herbaceous plants had created a humid and sheltered environment which is quite different from the mainly open exposed habitats found across the rest of the study area. A total of 35 species of bryophyte

were recorded, the majority of which were associated with the saxicolous environment, found on the rock walls of the gorge, in-stream and bankside rocks. Notable species included the acrocarpous moss, dotted thyme-moss (*Rhizomnium punctatum*); the leafy liverworts, western pouncewort (*Lejeunea lamacerina*), heath earwort (*Scapania irrigua*) and water earwort (*Scapania undulata*); and the pleurocarpous mosses long-beaked water feather-moss (*Platyhypnidium riparioides*) and rambling tail-moss (*Anomodon viticulosus*). Two species were found that are notable for their rarity on Anglesey and include Hartman's grimmia (*Grimmia hartmanii*) and fragrant crestwort (*Lophocolea fragrans*).

### **3.2.3 Tre'r Gof SSSI – Site 2**

The Tre'r Gof SSSI is a basin mire consisting of common reed (*Phragmites australis*) and saw sedge (*Cladium mariscus*) stands with large areas of willow scrub and marshy grassland. A total of 29 species were recorded, the majority of which were associated with the bark of the willows (*Salix* species). Notable species include the pleurocarpous moss, heart-leaved spear-moss (*Calliergon cordifolium*) and the leafy liverworts, minute pouncewort (*Cololejeunea minutissima*), fairy beads (*Microlejeunea ulicina*) and even scalewort (*Radula complanata*).

### **3.2.4 Wylfa Manor and Fields north of Tre'r Gof – Site 3**

This area included a small woodland and walled garden at Wylfa Manor and one large semi-improved field with scattered exposed rock. A total of 25 species were recorded, the majority of which were associated with the saxicolous environment, found on the rocks themselves and amongst the grassland in close proximity to the rocky outcrops. Notable species included the leafy liverworts, minute pouncewort (*Cololejeunea minutissima*) found on sycamore (*Acer pseudoplatanus*) next to the walled garden and dwarf flapwort (*Jungermannia pumila*) on an area of shaded rocks.

### **3.2.5 Trwyn Pencarreg Heath – Site 4**

The Trwyn Pencarreg Heath was found to be an area of heathland dominated by heather (*Calluna vulgaris*) and western gorse (*Ulex gallii*), interspersed with rocky outcrops and scattered damp depressions, where vegetation associated with wetter conditions exists. A total of eight common and widespread species were recorded, the majority of which were associated with the saxicolous environment, found on the rocks themselves and amongst the vegetation in close proximity to the rocky outcrops. There were no notable species found in this area during the survey or in any incidental records of species seen during other surveys.

### **3.2.6 West and east Cemlyn Bay and coast adjacent to Trwyn Pencarreg – Site 5**

This study area included a search of the acid grassland found at either end of the Esgair Gemlyn, a shingle ridge separating Cemlyn lagoon from Cemlyn Bay and the coastline adjacent to Trwyn Pencarreg heath. A total of 50 species were recorded, the majority of which were associated with acid grassland on Esgair Gemlyn and the coastal seepages adjacent to Trwyn Pencarreg. One notable species was recorded for Esgair Gemlyn, a pleurocarpous moss megapolitan feather moss (*Rhynchostegium megapolitanum*) found in the acid grassland, which is noted for its rareness on Anglesey. Other notable species were found in the coastal seepage areas adjacent to Trwyn Pencarreg and include the three leafy liverworts, ladder flapwort (*Nardia scalaris*), notched pouchwort (*Calypogeia arguta*) and crenulated

flapwort (*Jungermannia gracillima*); and the two acrocarpous mosses, blunt cord-moss (*Entosthodon obtusus*) and marsh forklet moss (*Dichodontium palustre*). Marsh forklet moss is noted for its rarity on Anglesey.



Plate 1: Bryophyte community found at Esgair Gemlyn



Plate 2: Coastal seepage habitat at Trwyn Pencarreg

### 3.2.7 Coast at Porth-y-pistyll – Site 6

The coast at Porth-y-pistyll comprised a stretch of coastal cliff with rocky outcrops interspersed with patches of bramble scrub and acid grassland, within the splash zone. A total of 21 species were recorded, the majority of which were associated with the coastal cliff and rocky outcrops. Notable species include the acrocarpous moss, alpine thread-moss (*Bryum alpinum*); the pleurocarpous moss, fox-tail feather-moss (*Thamnobryum alopecurum*); and the leafy liverwort, sea scalewort (*Frullania teneriffae*). One species was found that is notable for its rarity on Anglesey, the acrocarpous moss, curve-leaved ditrichum (*Ditrichum heteromallum*).



Plate 3: Coastal cliff habitat at Porth-y-pistyll



Plate 4: *Bryum alpinum* on coastal rocks at Porth-y-pistyll

### 3.2.8 Coastal strip west of Porth Wylfa – Site 7

The coastal strip west of Porth Wylfa comprised a stretch of coastal cliff with rocky outcrops interspersed with patches of bramble scrub and acid grassland, within the splash zone. The surveyed area of the site also included a small damp valley that joined the shore at the far west of the coastal strip. A total of 24 species were recorded, the species were generally associated with rocky outcrops, coastal rocks and the damp valley. Notable species found at this site include the pleurocarp moss, hair-pointed feather moss (*Cirriphyllum piliferum*); and the three leafy liverworts, Mueller's pouchwort (*Calypogeia muelleriana*), Killarney featherwort (*Plagiochila killarniensis*) and dwarf flapwort (*Jungermannia pumila*). Dwarf flapwort being noted for its rareness on Anglesey.

### 3.2.9 Farmland at Foel Fawr south of Tregele – Site 8

The farmland at Foel Fawr is an area of intensively managed fields comprising improved grassland bisected by a stream. Some fields have walls as boundaries and include small rocky outcrops. A total of 15 species were recorded, the majority of which were associated with the rocky outcrops. One notable species, green pocket moss (*Fissidens viridulus*) was found on a bare earth bank of an old drainage ditch.

### 3.2.10 Fields at Tregele – Site 9

The fields at Tregele comprised several small fields that have been managed as improved grassland for sheep pasture. A small watercourse on the edge of the fields drains an area of marshy grassland to the east. A total of eight common and widespread species were recorded, the majority of which were associated with the bank of the watercourse. There were no notable species found in this area during the survey or in any incidental records of species seen during other surveys.

### 3.2.11 Field south of Wylfa Information Centre – Site 10

The area south of the Wylfa Information Centre comprised two large fields, managed for a hay crop. A pond situated between the two fields is fed by a drainage ditch from the north. A total of nine species were recorded, generally associated with the bare ground habitats in close proximity to the pond and watercourse. The bare ground was considered likely to have been caused by cattle poaching when the fields were previously managed as pasture. Only one notable species, yellow thread-moss (*Pohlia lutescens*) was found on the soil near the pond.



Plate 5: Smooth Hornwort (*Phaeoceros laevis*) amongst old cattle-poached habitat

### 3.2.12 Field North of Caerdegog Isaf – Site 11

At Caerdegog Isaf the study area comprised one small field managed as improved grassland for sheep pasture with a small stand of trees and shrubs. A small watercourse bisected part of the field and drained into a ditch along its northern edge. A total of 19 species were recorded, the majority of which were associated with the bark of trees especially elder (*Sambucus nigra*). Two notable species were

found in this area, the acrocarpous moss Stirton's yolk-moss (*Zygodon stirtonii*) and the pleurocarpous moss, wall feather-moss (*Rhynchostegium murale*). Both species were found on elder bark, although it was unusual to find these species on this substrate. These mosses are normally saxicolous, i.e. found on rocks but are also known to be found on bark where mineral deposition has occurred.

### **3.2.13 Farmland south of Cafnan – Site 12**

The farmland south of Cafnan comprised an area of agriculturally improved grassland, consisting of four large fields and a dried pond. A large area of marshy grassland exists to the south in one of the fields. A total of six species of bryophyte were recorded, the majority of which were associated with the soil and bare ground. Two notable species were found in this area: the acrocarpous mosses, spreading earth moss (*Aphanorrhegma patens*) and blunt-fruited Pottia (*Tortula modica*), both noted for their rareness on Anglesey. The mosses were found growing on soil in the dried pond and the marshy grassland respectively.

### **3.2.14 South of Tre'r Gof SSSI – Site 13**

South of Tre'r Gof SSSI there was an area of farmland comprising agricultural poor, semi-improved grassland, which was grazed by sheep and cattle. Some of the fields had walls as boundaries and present in one of the fields was a large rocky outcrop. A total of 20 species were recorded, the majority of which were associated with the rocky outcrop and the concrete hard standing of the demolished Ty-Croes buildings. One notable species found at Ty-Croes, blunt-fruited Pottia (*Tortula modica*) is noted for its rarity on Anglesey.



Plate 6: Starry hoar-moss (*Hedwigia stellata*) found on rocky outcrops at Ty-Croes

### **3.2.15 South of Trwyn Pencarreg – Site 14**

South of Trwyn Pencarreg was an area of farmland that comprised agricultural improved and semi-improved grassland, grazed by sheep and cattle. The majority of the fields had walls as boundaries. In two of the fields there were large rocky outcrops, a small area of mire and sallow carr fed by the overflow of a stream. A total of 26 species were recorded, the majority of which were associated with the rocky outcrops and the bark of sallows. Two notable species were recorded, the pleurocarp megapolitan feather-moss (*Rhynchostegium megapolitanum*) was found

on bare soil under the sallow carr, and where there was sufficient light the thallose liverwort blueish veilwort (*Metzgeria fruticulosa*) was recorded on trees. Both these species are noted for their rarity on Anglesey. Other notable species were found in the carr on sallow bark and include mamillate plait-moss (*Hypnum andoi*) and fairy beads (*Microlejeunea ulicina*), and in the wet mire heart-leaved spearwort (*Calliergon cordifolium*) was found.

### **3.2.16 South-west of Power Station – Site 15**

South-west of the Existing Power Station was an area of poor semi-improved grassland with scattered scrub to the north and several rocky outcrops directly south of the power station. A ditch drained the area from a wetter rush-dominated field to the east. A total of 32 species were recorded in the vegetation in close proximity to the coastal rocks and on the coastal rocks themselves; other species were found on the ground amongst the lichen heath. Notable species found at this site include the leafy liverwort sea scalewort (*Frullania teneriffae*) and the acrocarpous moss hooded bristle-moss (*Orthotrichum cupulatum*).

### **3.2.17 Farmland south-west and south-east of Swn-y-mor – Site 16**

Site 16 was an area of farmland that comprised many agriculturally improved grassland fields grazed by cattle and sheep. The majority of the fields had walls for boundaries with few hedges. Two large rocky outcrops were present in a field to the west and a stream ran along the full length of the eastern edge of the land parcel. A total of 29 species were recorded, the majority of which were associated with the rocky outcrops and the banks of the stream. The banks of the stream were heavily poached and this was providing the bare bank habitat for notable species. One species recorded here was noted for its rarity on Anglesey, dotted hornwort (*Anthoceros punctatus*). Other notable species were also found on the banks of the stream including the leafy liverwort, St Winifrid's moss (*Chiloscyphus polyanthos*); the pleurocarp moss, dwarf feather-moss (*Rhynchostegiella pumila*); and the acrocarp mosses Tozer's thread-moss (*Epipterygium tozeri*) and Yellow thread-moss (*Pohlia lutescens*).



Plate 7: Liverwort and hornwort community on a cattle poached stream bank



Plate 8: Dotted Hornwort (*Anthoceros punctatus*) on stream bank

### 3.2.18 Farmland south, south-west and west of Nanner – Site 17

Site 17 was an area of farmland that comprised many agriculturally improved fields of grassland grazed by sheep. A large rocky outcrop was present in a field to the far west and a stream ran along the full length of the northern boundary of the land parcel. A total of 25 species were recorded, the majority of which were associated with the saxicolous environment of the rocky outcrops and rocks in the stream. There were no notable species found in this area during the survey or in any incidental records of species seen during other surveys.

### 3.2.19 Farmland north of Groes Fechan – Site 18

Site 18 was an area of farmland that comprised several agriculturally improved fields of grassland grazed by sheep and several arable fields. A rocky outcrop was present in two fields to the south-west and a heavily shaded ditch flowed along the north-westerly boundary of one of the fields. Two individual marshy grassland areas were found in a field to the south-west and one in the north-east of the land parcel. A small conifer plantation was located between the arable and grazing fields. A total of 22 species were recorded, the majority of which were associated with a damp sheep-poached area adjacent to the pine plantation. There were no notable species found in this area during the survey or in any incidental records of species seen during other surveys.



Plate 9: Typical bryophyte community on rock outcrops north of Cae Gwyn

### **3.2.20 Wylfa Head – Site 19**

Site 19 was an area of coastal acid grassland with large areas of dense continuous scrub. To the north was a stretch of coastal cliff with rocky outcrops interspersed with coastal grassland. Two seepage zones were present on the western edge of the land parcel that drained a small patch of marshy ground and emerged at the coastal cliff. A total of 26 species were recorded, generally associated with coastal rocks and the seepage zones. Notable species found at this site include the pleurocarpous moss, matted feather-moss (*Brachythecium populeum*); the leafy liverworts, dwarf flapwort (*Jungermannia pumila*), St Winifrid's moss (*Chiloscyphus polyanthus*) and sea scalewort (*Frullania teneriffae*); and the acrocarpous moss, thin cord-moss (*Entosthodon attenuatus*). Dwarf flapwort is noted for its rareness on Anglesey.

### **3.2.21 Wylfa Information Centre – Bank by road – Site 20**

Site 20 was a regularly strimmed grass and herbaceous bank that ran along the side of the road adjacent to the visitor centre. A total of five species were recorded during the survey. All of the species found on the bank are common and widespread on Anglesey.

### **3.2.22 Wylfa Social Club – Site 21**

Site 21 was an area of amenity grassland which had many planted conifer and deciduous trees, bordered by a large wall that surrounded the social club building. A total of 19 species were recorded. The majority of the species were found on the ground in amongst the trees and growing on the wall. There were no notable species found in this area during the survey or in any incidental records of species seen during other surveys.

### **3.2.23 Incidental species records**

During the NVC survey undertaken by Jacobs in 2013 an additional 34 species of bryophyte were recorded, of which seven were species that had not been recorded during the bryophyte survey in 2014. These species included thick-nerved apple moss (*Philonotis calcarea*), lesser notchwort (*Lophozia birenata*) common haircap

(*Polytrichum commune*), intermediate hook-moss (*Scorpidium cossonii*), blunt leaved bog-moss (*Sphagnum palustre*), spiky bog moss (*Sphagnum squarrosum*) and common tamarisk-moss (*Thuidium tamariscinum*) (see appendix C).

Four of these species are notable for Anglesey, and include dotted thyme-moss (*Rhizomnium punctatum*) found at Tre'r Gof SSSI (Site 2), dwarf flapwort, (*Jungermannia pumila*) found on the coast adjacent to Trwyn Pencarreg (Site 5), heart-leaved spearwort (*Calliergon cordifolium*) found at Cae Gwyn SSSI and sea scalewort (*Frullania teneriffae*) found on rock outcrops in farmland south of Tre'r Gof (Site 13). These four species were not found at these sites during the bryophyte survey of 2014.

During the macrophyte survey in 2014 two species of liverwort were recorded, of which the great scented liverwort (*Conocephalum conicum*) was not recorded during the bryophyte survey of 2014.

### **3.3 Summary of Results**

The most important sites in the study area for bryophyte communities were considered to be those where rare and less widespread species on Anglesey were found. These were:

- habitat features found at and in close proximity to the coast;
- mire systems; and
- heavily poached watercourses.

Important bryophyte areas are shown in figure 3 and include the mire systems at Tre'r Gof SSSI and west of Pont Cafnan (Area A and Area B respectively), the watercourse at Cestyll gardens (Area C), the seepage zones, upper shore rocks and coastal grassland interface at Porth-y-pistyll (Area G), west of Porth Wylfa (Area H), Wylfa Head (Area E) and Trwyn Pencarreg (including the acid grassland at Esgair Gemlyn – Area D). The ditch in Area F is also an important site for bryophyte communities.



**Figure 3: Important bryophyte habitat in the study area**

## 4 Discussion

The background data search provided by Cofnod, showed that there was one record of a notable species within the study area. There were no records of protected species. This is indicative of an area without any conservation significance for bryophytes beyond a local level, although it should be noted that background data searches are only representative of the level of survey effort. However, in this instance it is considered that the survey effort, evidenced both historically from Cofnod and surveys in more recent years, supports the conclusion that the study area is not regionally or nationally significant.

Eleven species found during the survey are considered to be rare on Anglesey (Hill *et al.*, 1994) and a further 34 species were considered to be notable, as they are only found as localised populations and therefore sparsely distributed across Anglesey (Hill *et al.*, 1994). Fifteen sites in the study area supported at least one or more notable species. It is therefore considered that the study area in the context of Anglesey may be of greater ecological importance, although as discussed below this is caveated by the low relative abundances of habitats that actually support notable species.

During this survey only one non-native species as listed by Porley and Hodgetts (2005), was recorded and this was the acrocarpous moss *Campylopus introflexus*. This species was found in many locations where the conditions were acidic. However, this moss requires dry, thin and acidic soil, which ensures that its potential as an invasive is low. All other species recorded were native to the UK and none of these are invasive.

The land within the study area surrounding the Existing Power Station provides various habitats for bryophyte communities to become established. Although predominately an agricultural environment, there were several streams and ditches that flow through the fields draining isolated mire systems, patches of heathland, coastal grassland and sallow carr. Scattered across the site there were also many rocky outcrops and combined with the aforementioned habitats created multiple niches for bryophyte assemblages. This diversity of habitats provided a variety of available substrates, high humidity micro-habitats, and varying pH of substrates. It is considered that this diversity of habitats was the main factor for the bryological diversity recorded.

In total, 126 species were found during the survey, with an additional eight species recorded during other ecological surveys in 2013/14. A significant number of these species were associated with certain habitats. The key habitats identified as having the most diverse species assemblages were the rocky outcrops, wet seepage zones and the upper shore rocks and coastal grassland interface. In addition, the cattle poached banks of the watercourses provided an important habitat, more specifically the bare earth and rocks associated with this habitat. Another important landscape feature found in the study area for established bryophyte communities was provided by the barks of sallow carr found at the mire systems. These habitats are not abundant in the study area, but the importance of these micro-habitats to the overall bryophyte assemblages should not be undervalued.

There was a very low diversity of bryophytes associated with the arable habitats, which can be a suitable habitat for annual bryophytes. The reason for this scarcity of arable bryophytes is probably related to there being a much higher percentage of

pasture compared to arable crops in the study area. This trend is also shown in the literature with many arable bryophyte species clearly showing more southern and eastern distributions in Britain (Porley, 2008).

## 5 Conclusions

This survey aimed to update the lower plant survey conducted by Arup in 2012 (Arup, 2012) and to provide baseline data to assess the relevant diversity of the bryophyte fauna in selected habitats across the study area. It is considered that the aims of this survey were achieved.

The total number of species recorded in the study area was 134 (including species recorded incidentally during previous surveys). This included 11 species that were considered to be rare on Anglesey and a further 34 species that were considered to be ‘local’, as they have only been found as localised populations and therefore sparsely distributed across Anglesey (Hill *et al.*, 1994). Fifteen sites in the study area accommodated at least one or more notable species. None of the species found were of national importance or were protected species.

The number of bryophyte species recorded in the study area was considered to be slightly higher than what would be expected for an area that is predominantly agricultural land. This was largely due to the number of micro-habitat types present and coastal influences. The species composition however, was considered to be typical for the habitat types present.

The surveys showed that the habitats associated with the coast and mire systems were more important for bryophytes due to the higher diversity of species and communities associated with this zone. These habitat types covered a much lower percentage of the study area than the dominant habitat type, which is predominantly improved agricultural land. The best habitats for bryophytes in the study area were therefore among the least abundant.

## 6 References

- Arup, (2012), *Lower Plant Appraisal Report*, consultancy report on behalf of Horizon Nuclear Power (Wylfa) Ltd.
- Atherton I., Bosanquet S. and Lawley M., (2010), *Mosses and Liverworts of Britain and Ireland a field guide*, British Bryological Society.
- Hill M.O., Preston C.D. and Smith A.J.E., (1994), *Atlas of the Bryophytes of Britain and Ireland*, Harley Books, Colchester, Essex.
- Hodgetts N., (2011), *A revised Red List of bryophytes in Britain*, Field Bryology No 103.
- Institute of Geological Sciences NERC (Natural Environment Research Council), (1980), *Anglesey Special Sheet Solid Edition 1:50,000*, Director General of the Ordnance Survey, Southampton.
- Jacobs, (2013), *Consultancy Report: A Phase 1 Habitat Survey*, consultancy report on behalf of Horizon Nuclear Power (Wylfa) Ltd. Ref. W202.01-S5-PAC-REP-00015.
- Porley R., (2008), *Arable Bryophytes: A Field Guide to the Mosses, Liverworts and Hornworts of Cultivated Land in Britain and Ireland*, Wildguides Ltd, Old Basing, Hampshire.
- Porley R. and Hodgetts N., (2005), *The Naturalist Library Mosses and Liverworts*, Harper Collins Publishers, London.
- Smith A.J.E., (1996), *The Liverworts of Britain and Ireland*, Cambridge University Press.
- Smith A.J.E., (1996), *The Moss Flora of Britain and Ireland*, Cambridge University Press.

## Appendix A      Incidental Species List

**Table 3: Incidental species list**

Species	Common Name	Site	Grid Ref	Date	Comment
<i>Aulacomnium palustre</i>	Bog groove-moss	Cae Gwyn SSSI	SH34489174	23-Jul-13	Recorded during the NVC survey
<i>Aulacomnium palustre</i>	Bog groove-moss	Cae Gwyn SSSI	SH3491	23-Jul-13	Recorded during the NVC survey
<i>Brachythecium albicans</i>	Whitish feather-moss	Heathland at quarry	SH348914	24-Jun-14	Recorded during the NVC survey
<i>Brachythecium rutabulum</i>	Rough-stalked feather-moss	Mynydd Ithel Farm	SH340921	24-Jun-14	Recorded during the NVC survey
<i>Calliergon cordifolium</i> **	Heart-leaved spear-moss	Cae Gwyn SSSI	SH3491	23-Jul-13	Recorded during the NVC survey
<i>Calliergonella cuspidata</i>	Pointed Spear-moss	Cae Gwyn SSSI	SH3491	23-Jul-13	Recorded during the NVC survey
<i>Calliergonella cuspidata</i>	Pointed spear-moss	Mynydd Ithel Farm	SH340921	24-Jun-14	Recorded during the NVC survey
<i>Calliergonella cuspidata</i>	Pointed spear-moss	Trwyn Pencarreg heath	SH3493	24-Jul-13	Recorded during the NVC survey
<i>Campylopus introflexus</i>	Heath star moss	Heathland at quarry	SH348914	24-Jun-14	Recorded during the NVC survey
<i>Conocephalum conicum</i> *	Great scented liverwort	Watercourse south of Nanner	SH 3356 9220	10-Jul-14	Recorded during the aquatic macrophyte surveys on bank of ditch under overhanging vegetation
<i>Dicranum scoparium</i>	Broom fork-moss	Cae Gwyn SSSI	SH34489174	23-Jul-13	Recorded during the NVC survey
<i>Dicranum scoparium</i>	Broom fork-moss	Cae Gwyn SSSI	SH3491	23-Jul-13	Recorded during the NVC survey
<i>Dicranum scoparium</i>	Broom fork-moss	Heathland at quarry	SH348914	24-Jun-14	Recorded during the NVC survey
<i>Frullania dilatata</i>	Dilated scalewort	Coast east of Wylfa Head	SH3593	27-Nov-13	On rock outcrops - Recorded during the NVC survey
<i>Frullania teneriffae</i> **	Sea scalewort	Coast east of Wylfa Head	SH3593	27-Nov-13	On rock outcrops - Recorded during the NVC survey
<i>Hypnum jutlandicum</i>	Heath plait-moss	Heathland at quarry	SH348914	24-Jun-14	Recorded during the NVC survey
<i>Jungermannia pumila</i> **	Dwarf flapwort	Coast adjacent to Trwyn Pencarreg	SH33829352	26-Nov-13	Recorded during the NVC survey
<i>Kindbergia praelonga</i>	Common feather-moss	Mynydd Ithel Farm	SH340921	24-Jun-14	Recorded during the NVC survey
<i>Kindbergia praelonga</i>	Common feather-moss	Heathland at quarry	SH348914	24-Jun-14	Recorded during the NVC survey
<i>Lophozia birenata</i> *	Lesser notchwort	Coast adjacent to Trwyn Pencarreg	SH33829352	26-Nov-13	Recorded during the NVC survey
<i>Lunularia cruciata</i>	Crescent cup liverwort	Watercourse at Cafnan	SH 3415 9300	10-Jul-14	Recorded during aquatic macrophyte surveys on bare earth of ditch bank
<i>Philonotis calcarea</i> *	Thick-nerved apple-moss	Tre'r Gof SSSI	SH35969366	17-Jul-13	Recorded during the NVC survey
<i>Polytrichum commune</i> *	Common haircap	Cae Gwyn SSSI	SH34679173	24-Jul-13	Recorded during the NVC survey
<i>Polytrichum commune</i> *	Common haircap	Cae Gwyn SSSI	SH3491	23-Jul-13	Recorded during the NVC survey
<i>Polytrichum piliferum</i>	Bristly haircap	Trwyn Pencarreg Heath	SH3493	26-Nov-13	Recorded during the NVC survey
<i>Polytrichum piliferum</i>	Bristly haircap	Trwyn Pencarreg Heath	SH3393	26-Nov-13	Recorded during the NVC survey
<i>Pseudoscleropodium purum</i>	Neat feather-moss	Cae Gwyn SSSI	SH3491	23-Jul-13	Recorded during the NVC survey
<i>Rhizomnium punctatum</i> **	Dotted thyme-moss	Tre'r Gof SSSI	SH3693	17-Jul-13	Recorded during the NVC survey
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	Cae Gwyn SSSI	SH3491	23-Jul-13	Recorded during the NVC survey
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	Mynydd Ithel Farm	SH340921	24-Jun-14	Recorded during the NVC survey

Species	Common Name	Site	Grid Ref	Date	Comment
<i>Scorpidium cossonii</i> *	Intermediate hook-moss	Cae Gwyn SSSI	SH3491	23-Jul-13	Recorded during the NVC survey
<i>Sphagnum palustre</i> *	Blunt-leaved bog-moss	Cae Gwyn SSSI	SH3491	23-Jul-13	Recorded during the NVC survey
<i>Sphagnum squarrosum</i> *	Spiky bog-moss	Cae Gwyn SSSI	SH3491	23-Jul-13	Recorded during the NVC survey
<i>Sphagnum subnitens</i>	Lustrous bog-moss	Cae Gwyn SSSI	SH3491	23-Jul-13	Recorded during the NVC survey
<i>Thuidium tamariscinum</i> *	Common tamarisk-moss	Cae Gwyn SSSI	SH34489174	23-Jul-13	Recorded during the NVC survey
<i>Thuidium tamariscinum</i> *	Common tamarisk-moss	Cae Gwyn SSSI	SH3491	23-Jul-13	Recorded during the NVC survey

\*Not recorded during bryophyte field surveys

\*\*Notable species

## Appendix B Species List Recorded by Survey Site

Table 4: Site 1 – List of Bryophytes recorded

Species	Common Name	Site	Grid Ref	Date	Comment
<i>Amblystegium serpens</i>	Creeping feather-moss	Cestyll Gardens	SH345932	18-Sep-14	On or near rocks or stones
<i>Anomodon viticulosus</i>	Rambling tail-moss	Cestyll Gardens	SH345932	18-Sep-14	On wet rocks in stream valley
<i>Brachythecium rutabulum</i>	Rough-stalked feather-moss	Cestyll Gardens	SH345932	18-Sep-14	Present but uncommon
<i>Bryum capillare</i>	Capillary thread-moss	Cestyll Gardens	SH345932	18-Sep-14	On or near rocks or stones
<i>Calliergonella cuspidata</i>	Pointed spear-moss	Cestyll Gardens	SH345932	18-Sep-14	On ground by stream
<i>Calypogeia muelleriana</i>	Mueller's pouchwort	Cestyll Gardens	SH345932	18-Sep-14	On wet rocks in stream valley
<i>Cephalozia bicuspidata</i>	Two-horned pincerwort	Cestyll Gardens	SH345932	18-Sep-14	On damp and shady ground
<i>Dicranoweisia cirrata</i>	Common pincushion	Cestyll Gardens	SH345932	18-Sep-14	On or near rocks or stones
<i>Fontinalis antipyretica</i>	Greater water-moss	Cestyll Gardens	SH345932	18-Sep-14	In the stream
<i>Grimmia hartmanii</i>	Hartman's grimmia	Cestyll Gardens	SH345932	18-Sep-14	On wet rocks in stream valley
<i>Grimmia trichophylla</i>	Hair-pointed grimmia	Cestyll Gardens	SH345932	18-Sep-14	On dry rock lower down stream valley
<i>Hedwigia stellata</i>	Starry hoar-moss	Cestyll Gardens	SH345932	18-Sep-14	On dry rock lower down stream valley
<i>Homalothecium sericeum</i>	Silky wall feather-moss	Cestyll Gardens	SH345932	18-Sep-14	On or near rocks or stones
<i>Hypnum andoi</i>	Mamillate plait-moss	Cestyll Gardens	SH345932	18-Sep-14	On bark of apple tree
<i>Hypnum cupressiforme</i>	Cypress-leaved plait-moss	Cestyll Gardens	SH345932	18-Sep-14	-
<i>Hypnum jutlandicum</i>	Heath plait-moss	Cestyll Gardens	SH345932	18-Sep-14	On or near rocks or stones
<i>Isothecium myosuroides</i>	Slender mouse-tail moss	Cestyll Gardens	SH345932	18-Sep-14	On bark of rowan tree
<i>Kindbergia praelonga</i>	Common feather-moss	Cestyll Gardens	SH345932	18-Sep-14	-
<i>Lejeunea lamacerina</i>	Western pouncewort	Cestyll Gardens	SH345932	18-Sep-14	On wet rocks in stream valley
<i>Lophocolea bidentata</i>	Bifid crestwort	Cestyll Gardens	SH345932	18-Sep-14	-
<i>Lophocolea fragrans</i>	Fragrant crestwort	Cestyll Gardens	SH345932	18-Sep-14	On wet rocks in stream valley
<i>Lunularia cruciata</i>	Crescent-cup liverwort	Cestyll Gardens	SH345932	18-Sep-14	On ground by stream
<i>Metzgeria furcata</i>	Forked veilwort	Cestyll Gardens	SH345932	18-Sep-14	On wet rocks in stream valley
<i>Mnium hornum</i>	Swan's-neck thyme-moss	Cestyll Gardens	SH345932	18-Sep-14	-
<i>Pellia epiphylla</i>	Overleaf pellia	Cestyll Gardens	SH345932	18-Sep-14	On ground by stream
<i>Platyhypnidium riparioides</i>	Long-beaked water feather-moss	Cestyll Gardens	SH345932	18-Sep-14	In the stream
<i>Polytrichum juniperinum</i>	Juniper haircap	Cestyll Gardens	SH345932	18-Sep-14	On or near rocks or stones
<i>Pseudocrossidium revolutum</i>	Revolute beard-moss	Cestyll Gardens	SH345932	18-Sep-14	On rocks by stream
<i>Pseudotaxiphyllum elegans</i>	Elegant silk-moss	Cestyll Gardens	SH345932	18-Sep-14	On damp,shady ground
<i>Rhizomnium punctatum</i>	Dotted thyme-moss	Cestyll Gardens	SH345932	18-Sep-14	In damp,shaded grassland
<i>Rhynchostegium confertum</i>	Clustered feather-moss	Cestyll Gardens	SH345932	18-Sep-14	On ground by stream
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	Cestyll Gardens	SH345932	18-Sep-14	-

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Scapania irrigua</i>	Heath earwort	Cestyll Gardens	SH345932	18-Sep-14	On wet rocks in stream valley
<i>Scapania undulata</i>	Water earwort	Cestyll Gardens	SH345932	18-Sep-14	On wet rocks in stream valley
<i>Thamnobryum alopecurum</i>	Fox-tail feather-moss	Cestyll Gardens	SH345932	18-Sep-14	In the stream

**Table 5: Site 2 – List of Bryophytes recorded**

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Brachythecium rutabulum</i>	Rough-stalked feather-moss	Tre'r Gof SSSI	SH357936	10-Sep-14	-
<i>Bryum pseudotriquetrum</i>	Marsh bryum	Tre'r Gof SSSI	SH357936	10-Sep-14	-
<i>Calliergon cordifolium</i>	Heart-leaved spear-moss	Tre'r Gof SSSI	SH357936	10-Sep-14	In eastern areas of the site
<i>Calliergonella cuspidata</i>	Pointed spear-moss	Tre'r Gof SSSI	SH357936	10-Sep-14	-
<i>Campylium stellatum</i>	Yellow starry feather-moss	Tre'r Gof SSSI	SH357936	10-Sep-14	Large quantity at SH 3586 9360
<i>Campylopus introflexus</i>	Heath star moss	Tre'r Gof SSSI	SH357936	10-Sep-14	On gorse bark
<i>Cololejeunea minutissima</i>	Minute pouncewort	Tre'r Gof SSSI	SH357936	10-Sep-14	On sallow bark
<i>Cratoneuron filicinum</i>	Fern-leaved hook-moss	Tre'r Gof SSSI	SH357936	10-Sep-14	Especially around SH 3586 9360
<i>Fissidens bryoides</i>	Lesser pocket-moss	Tre'r Gof SSSI	SH357936	10-Sep-14	On wall by the adjacent lane
<i>Frullania dilatata</i>	Dilated scalewort	Tre'r Gof SSSI	SH357936	10-Sep-14	On sallow bark
<i>Homalothecium sericeum</i>	Silky wall feather-moss	Tre'r Gof SSSI	SH357936	10-Sep-14	Near base of sallows
<i>Hypnum cupressiforme</i>	Cypress-leaved plait-moss	Tre'r Gof SSSI	SH357936	10-Sep-14	Near base of sallows
<i>Hypnum resupinatum</i>	Supine plait-moss	Tre'r Gof SSSI	SH357936	10-Sep-14	On sallow bark
<i>Isothecium myosuroides</i>	Slender mouse-tail moss	Tre'r Gof SSSI	SH357936	10-Sep-14	Near base of sallows
<i>Kindbergia praelonga</i>	Common feather-moss	Tre'r Gof SSSI	SH357936	10-Sep-14	-
<i>Lophocolea bidentata</i>	Bifid crestwort	Tre'r Gof SSSI	SH357936	10-Sep-14	-
<i>Metzgeria furcata</i>	Forked veilwort	Tre'r Gof SSSI	SH357936	10-Sep-14	On sallow bark
<i>Microlejeunea ulicina</i>	Fairy beads	Tre'r Gof SSSI	SH357936	10-Sep-14	On sallow bark
<i>Mnium hornum</i>	Swan's-neck thyme-moss	Tre'r Gof SSSI	SH357936	10-Sep-14	-
<i>Orthotrichum diaphanum</i>	White-tipped bristle-moss	Tre'r Gof SSSI	SH357936	10-Sep-14	On sallow bark
<i>Orthotrichum</i> sp. (probably <i>O. affine</i> )	Wood bristle-moss	Tre'r Gof SSSI	SH357936	10-Sep-14	On sallow bark - ID not 100% certain without capsules
<i>Pellia epiphylla</i>	Overleaf pellia	Tre'r Gof SSSI	SH357936	10-Sep-14	-
<i>Plagiomnium undulatum</i>	Hart's-tongue thyme-moss	Tre'r Gof SSSI	SH357936	10-Sep-14	-
<i>Radula complanata</i>	Even scalewort	Tre'r Gof SSSI	SH357936	10-Sep-14	On sallow bark
<i>Rhynchostegium confertum</i>	Clustered feather-moss	Tre'r Gof SSSI	SH357936	10-Sep-14	-
<i>Riccardia chamedryfolia</i>	Jagged germanderwort	Tre'r Gof SSSI	SH357936	10-Sep-14	-
<i>Sphagnum subnitens</i> var. <i>subnitens</i>	Lustrous bog-moss	Tre'r Gof SSSI	SH357936	10-Sep-14	-
<i>Ulota bruchii</i>	Bruch's pincushion	Tre'r Gof SSSI	SH357936	10-Sep-14	On sallow bark
<i>Ulota phyllantha</i>	Frizzled pincushion	Tre'r Gof SSSI	SH357936	10-Sep-14	In large quantity on sallow bark

**Table 6: Site 3 – List of Bryophytes recorded**

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Amblystegium serpens</i>	Creeping feather-moss	Wylfa Manor	SH355939	09-Sep-14	On bark of sycamores
<i>Brachythecium albicans</i>	Whitish feather-moss	Wylfa Manor	SH355939	09-Sep-14	Open area with rocks and acid grassland
<i>Brachythecium rutabulum</i>	Rough-stalked feather-moss	Wylfa Manor	SH355939	09-Sep-14	On bark of sycamores
<i>Campylopus flexuosus</i>	Rusty swan-neck moss	Fields North of Tre'r Gof	SH356940	09-Sep-14	In grassland by rocks
<i>Ceratodon purpureus</i>	Redshank	Fields North of Tre'r Gof	SH356940	09-Sep-14	In grassland by rocks
<i>Cololejeunea minutissima</i>	Minute pouncewort	Wylfa Manor	SH355939	09-Sep-14	On bark of sycamores
<i>Dicranoweisia cirrata</i>	Common pincushion	Wylfa Manor	SH355939	09-Sep-14	Open area with rocks and acid grassland
<i>Dicranum scoparium</i>	Broom fork-moss	Fields North of Tre'r Gof	SH356940	09-Sep-14	In grassland by rocks
<i>Didymodon insulanus</i>	Cylindric beard-moss	Wylfa Manor	SH355939	09-Sep-14	Open area with rocks and acid grassland
<i>Frullania dilatata</i>	Dilated scalewort	Wylfa Manor	SH355939	09-Sep-14	On bark of sycamores
<i>Homalothecium sericeum</i>	Silky wall feather-moss	Fields North of Tre'r Gof	SH356940	09-Sep-14	On shady rocks
<i>Hypnum cupressiforme</i>	Cypress-leaved plait-moss	Fields North of Tre'r Gof	SH356940	09-Sep-14	On grassland by rocks
<i>Hypnum cupressiforme</i>	Cypress-leaved plait-moss	Fields North of Tre'r Gof	SH356940	09-Sep-14	In grassland by rocks
<i>Hypnum jutlandicum</i>	Heath plait-moss	Fields North of Tre'r Gof	SH356940	09-Sep-14	In grassland by rocks
<i>Jungermannia pumila</i>	Dwarf flapwort	Fields North of Tre'r Gof	SH356940	09-Sep-14	On shady rocks
<i>Kindbergia praelonga</i>	Common feather-moss	Fields North of Tre'r Gof	SH356940	09-Sep-14	In grassland by rocks
<i>Lophocolea bidentata</i>	Bifid crestwort	Fields North of Tre'r Gof	SH356940	09-Sep-14	On shady rocks
<i>Mnium hornum</i>	Swan's-neck thyme-moss	Fields North of Tre'r Gof	SH356940	09-Sep-14	On shady rocks
<i>Orthotrichum diaphanum</i>	White-tipped bristle-moss	Wylfa Manor	SH355939	09-Sep-14	On bark of sycamores
<i>Orthotrichum</i> sp. (probably <i>O. affine</i> )	Wood bristle-moss	Wylfa Manor	SH355939	09-Sep-14	On bark of sycamores - ID not 100% certain without capsules
<i>Plagiomnium undulatum</i>	Hart's-tongue thyme-moss	Fields North of Tre'r Gof	SH356940	09-Sep-14	On shady rocks
<i>Polytrichum juniperinum</i>	Juniper haircap	Fields North of Tre'r Gof	SH356940	09-Sep-14	On shady rocks
<i>Ptilidium ciliare</i>	Ciliated fringewort	Fields North of Tre'r Gof	SH356940	09-Sep-14	On shady rocks
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	Wylfa Manor	SH355939	09-Sep-14	Open area with rocks and acid grassland
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	Fields North of Tre'r Gof	SH356940	09-Sep-14	In grassland by rocks

**Table 7: Site 4 – List of Bryophytes recorded**

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Campylopus introflexus</i>	Heath star moss	Trwyn Pencarreg Heath	SH339935	18-Sep-14	-
<i>Dicranella heteromalla</i>	Silky forklet-moss	Trwyn Pencarreg Heath	SH339935	18-Sep-14	-
<i>Dicranum scoparium</i>	Broom fork-moss	Trwyn Pencarreg Heath	SH339935	18-Sep-14	-
<i>Grimmia pulvinata</i>	Grey-cushioned grimmia	Trwyn Pencarreg Heath	SH339935	18-Sep-14	On inland boundary wall
<i>Hypnum jutlandicum</i>	Heath plait-moss	Trwyn Pencarreg Heath	SH339935	18-Sep-14	-
<i>Hypnum lacunosum</i> var. <i>lacunosum</i>	Great Plait-moss	Trwyn Pencarreg Heath	SH339935	18-Sep-14	-

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Mnium hornum</i>	Swan's-neck thyme-moss	Trwyn Pencarreg Heath	SH339935	18-Sep-14	-
<i>Polytrichum juniperinum</i>	Juniper haircap moss	Trwyn Pencarreg Heath	SH339935	18-Sep-14	-

**Table 8: Site 5 – List of Bryophytes recorded**

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Amblystegium serpens</i>	Creeping feather-moss	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas
<i>Brachythecium albicans</i>	Whitish feather-moss	Cemlyn Bay - west	SH330935	18-Sep-14	In grassland above the shore
<i>Bryum argenteum</i>	Silver-moss	Cemlyn Bay - east	SH335931	18-Sep-14	In grassland
<i>Bryum argenteum</i>	Silver-moss	Cemlyn Bay - west	SH330935	18-Sep-14	In grassland above the shore
<i>Bryum capillare</i>	Capillary thread-moss	Cemlyn Bay - west	SH330935	18-Sep-14	On a wall
<i>Bryum pseudotriquetrum</i>	Marsh bryum	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas
<i>Calliergonella cuspidata</i>	Pointed spear-moss	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas
<i>Calypogeia arguta</i>	Notched pouchwort	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas
<i>Calypogeia fissa</i>	Common pouchwort	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas
<i>Campylopus introflexus</i>	Heath star moss	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On coastal rocks
<i>Cephalozia bicuspidata</i>	Two-horned pincerwort	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas
<i>Cephaloziella hampeana</i>	Hampe's threadwort	Cemlyn Bay - east	SH335931	18-Sep-14	On bare damp ground
<i>Ceratodon purpureus</i>	Redshank	Cemlyn Bay - west	SH330935	18-Sep-14	In acid grassland
<i>Cratoneuron filicinum</i>	Fern-leaved hook-moss	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas
<i>Dichodontium palustre</i>	Marsh forklet-moss	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas
<i>Dicranoweisia cirrata</i>	Common pincushion	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On coastal rocks
<i>Dicranum scoparium</i>	Broom fork-moss	Cemlyn Bay - west	SH330935	18-Sep-14	In dry acid grassland area
<i>Didymodon luridus</i>	Dusky beard-moss	Cemlyn Bay - west	SH330935	18-Sep-14	On wall top
<i>Entosthodon obtusus</i>	Blunt cord-moss	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas
<i>Fissidens limbatus</i>	Herzog's pocket-moss	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas but ID not 100% certain
<i>Fossumbronia</i> sp. (probably <i>F.incurva</i> )	Weedy frillwort	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas but ID not very certain
<i>Fossumbronia</i> sp. (probably <i>F.pusilla</i> )	Common frillwort	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas

Species	Common Name	Site	Grid Ref	Date	Comment
<i>Frullania tamarisci</i>	Tamarisk scalewort	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On coastal rocks
<i>Grimmia pulvinata</i>	Grey-cushioned grimmia	Cemlyn Bay - west	SH330935	18-Sep-14	On a wall
<i>Grimmia trichophylla</i>	Hair-pointed grimmia	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On coastal rocks
<i>Homalothecium sericeum</i>	Silky wall feather-moss	Cemlyn Bay - west	SH330935	18-Sep-14	On a wall
<i>Hypnum cupressiforme</i>	Cypress-leaved plait-moss	Cemlyn Bay - west	SH330935	18-Sep-14	In grassland above the shore
<i>Hypnum jutlandicum</i>	Heath plait-moss	Cemlyn Bay - west	SH330935	18-Sep-14	In dry acid grassland area
<i>Hypnum lacunosum</i> var. <i>lacunosum</i>	Great plait-moss	Cemlyn Bay - east	SH335931	18-Sep-14	In acid grassland
<i>Hypnum lacunosum</i> var. <i>lacunosum</i>	Great plait-moss	Cemlyn Bay - west	SH330935	18-Sep-14	In dry acid grassland area
<i>Hypnum resupinatum</i>	Heath plait-moss	Cemlyn Bay - east	SH335931	18-Sep-14	In acid grassland
<i>Jungermannia gracillima</i>	Crenulated flapwort	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas
<i>Kindbergia praelonga</i>	Common feather-moss	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	
<i>Kindbergia praelonga</i>	Common feather-moss	Cemlyn Bay - west	SH330935	18-Sep-14	In grassland above the shore
<i>Mnium hornum</i>	Swan's-neck thyme-moss	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas
<i>Nardia scalaris</i>	Ladder flapwort	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas
<i>Pseudocrossidium hornschuchianum</i>	HornsChuck's beard-moss	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas
<i>Pseudoscleropodium purum</i>	Neat feather-moss	Cemlyn Bay - west	SH330935	18-Sep-14	In dry acid grassland area
<i>Rhynchostegium megapolitanum</i>	Megapolitan feather-moss	Cemlyn Bay - west	SH330935	18-Sep-14	In grassland
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	Cemlyn Bay - east	SH335931	18-Sep-14	In grassland
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	Cemlyn Bay - west	SH330935	18-Sep-14	In grassland above the shore
<i>Riccardia chamedryfolia</i>	Jagged germanderwort	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On coastal rocks
<i>Schistidium maritimum</i>	Seaside grimmia	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On coastal rocks
<i>Schistidium maritimum</i>	Seaside grimmia	Cemlyn Bay - west	SH330935	18-Sep-14	On coastal rocks
<i>Sphagnum denticulatum</i>	Cow-horn bog-moss	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas
<i>Sphagnum inundatum</i>	Lesser cow-horn bog-moss	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas
<i>Tortella flavovirens</i>	Yellow crisp-moss	Cemlyn Bay - west	SH330935	18-Sep-14	On the edge of the saltmarsh area
<i>Tortula muralis</i>	Wall screw-moss	Cemlyn Bay - west	SH330935	18-Sep-14	On a wall

Species	Common Name	Site	Grid Ref	Date	Comment
<i>Trichostomum crispulum</i>	Curly Crisp-moss	Coast adjacent to Trwyn Pencarreg	SH340936	18-Sep-14	On seepage areas

**Table 9: Site 6 – List of Bryophytes recorded**

Species	Common Name	Site	Grid Ref	Date	Comment
<i>Amblystegium serpens</i>	Creeping feather-moss	Coast at Porth-y-pistyll	SH345935	18-Sep-14	On coastal rocks
<i>Bryum alpinum</i>	Alpine thread-moss	Coast at Porth-y-pistyll	SH345935	18-Sep-14	On coastal rocks
<i>Bryum</i> sp. ( probably <i>B.caespiticium</i> )	Tufted thread-moss	Coast at Porth-y-pistyll	SH345935	18-Sep-14	On coastal rocks but ID not 100% certain without capsules
<i>Calliergonella cuspidata</i>	Pointed spear-moss	Coast at Porth-y-pistyll	SH345935	18-Sep-14	At base of wet rocks
<i>Dicranella heteromalla</i>	Silky forklet-moss	Coast at Porth-y-pistyll	SH345935	18-Sep-14	On coastal rocks
<i>Dicranoweisia cirrata</i>	Common pincushion	Coast at Porth-y-pistyll	SH345935	18-Sep-14	On coastal rocks
<i>Ditrichum heteromallum</i>	Curve-leaved ditrichum	Coast at Porth-y-pistyll	SH345935	18-Sep-14	On coastal rocks
<i>Fontinalis antipyretica</i>	Greater water-moss	Coast at Porth-y-pistyll	SH345935	18-Sep-14	In seepage over wet rocks
<i>Fossumbronia</i> sp. (probably <i>F.pusilla</i> )	Common frillwort	Coast at Porth-y-pistyll	SH345935	18-Sep-14	On coastal rocks
<i>Frullania teneriffae</i>	Sea scalewort	Coast at Porth-y-pistyll	SH345935	18-Sep-14	On coastal rocks
<i>Homalothecium sericeum</i>	Silky wall feather-moss	Coast at Porth-y-pistyll	SH345935	18-Sep-14	On coastal rocks
<i>Hypnum cupressiforme</i>	Cypress-leaved plait-moss	Coast at Porth-y-pistyll	SH345935	18-Sep-14	On coastal rocks
<i>Hypnum jutlandicum</i>	Heath plait-moss	Coast at Porth-y-pistyll	SH345935	18-Sep-14	In coastal grassland
<i>Kindbergia praelonga</i>	Common feather-moss	Coast at Porth-y-pistyll	SH345935	18-Sep-14	In coastal grassland
<i>Lophocolea bidentata</i>	Bifid crestwort	Coast at Porth-y-pistyll	SH345935	18-Sep-14	On coastal rocks
<i>Mnium hornum</i>	Swan's-neck thyme-moss	Coast at Porth-y-pistyll	SH345935	18-Sep-14	On coastal rocks
<i>Pseudoscleropodium purum</i>	Neat feather-moss	Coast at Porth-y-pistyll	SH345935	18-Sep-14	
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	Coast at Porth-y-pistyll	SH345935	18-Sep-14	In coastal grassland
<i>Schistidium maritimum</i>	Seaside grimmia	Coast at Porth-y-pistyll	SH345935	18-Sep-14	On exposed coastal rocks
<i>Thamnobryum alopecurum</i>	Fox-tail feather-moss	Coast at Porth-y-pistyll	SH345935	18-Sep-14	Under gorse on cliff
<i>Trichostomum brachydontium</i>	Variable crisp-moss	Coast at Porth-y-pistyll	SH345935	18-Sep-14	On coastal rocks

**Table 10: Site 7 – List of Bryophytes recorded**

Species	Common Name	Site	Grid Ref	Date	Comment
<i>Barbula convoluta</i>	Lesser bird's-claw beard-moss	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	-
<i>Bryum capillare</i>	Capillary thread-moss	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	-
<i>Calypogeia fissa</i>	Common pouchwort	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	On shady coastal rocks
<i>Calypogeia muelleriana</i>	Mueller's pouchwort	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	Coastal soil banks
<i>Campylopus introflexus</i>	Heath star moss	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	-

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Cephalozia bicuspidata</i>	Two-horned pincerwort	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	Wet coastal soil banks
<i>Ceratodon purpureus</i>	Redshank	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	-
<i>Cirriphyllum piliferum</i>	Hair-pointed feather-moss	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	By shady rocks near coast
<i>Dicranoweisia cirrata</i>	Common pincushion	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	Coastal rocks
<i>Frullania tamarisci</i>	Tamarisk scalewort	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	On rocks
<i>Hypnum jutlandicum</i>	Heath plait-moss	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	-
<i>Hypnum resupinatum</i>	Supine plait-moss	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	-
<i>Jungermannia pumila</i>	Dwarf flapwort	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	Wet coastal soil banks
<i>Kindbergia praelonga</i>	Common feather-moss	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	-
<i>Lophocolea bidentata</i>	Bifid crestwort	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	-
<i>Mnium hornum</i>	Swan's-neck thyme-moss	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	-
<i>Plagiochila killarniensis</i>	Killarney featherwort	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	Wet coastal soil banks
<i>Polytrichum juniperinum</i>	Juniper haircap	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	-
<i>Polytrichum piliferum</i>	Bristly haircap	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	-
<i>Pseudocrossidium hornschuchianum</i>	Hornschuch's beard-moss	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	-
<i>Pseudoscleropodium purum</i>	Neat feather-moss	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	-
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	-
<i>Schistidium maritimum</i>	Seaside grimmia	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	Coastal rocks
<i>Trichostomum brachydontium</i>	Variable crisp-moss	Coastal strip west of Porth Wylfa	SH360939	09-Sep-14	Coastal rocks

**Table 11: Site 8 – List of Bryophytes recorded**

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Brachythecium albicans</i>	Whitish feather-moss	Farmland at Foel Fawr south of Tregele	SH356920	17-Sep-14	On rock outcrops
<i>Brachythecium rutabulum</i>	Rough-stalked feather-moss	Farmland at Foel Fawr south of Tregele	SH356920	17-Sep-14	-
<i>Bryum capillare</i>	Capillary thread-moss	Farmland at Foel Fawr south of Tregele	SH356920	17-Sep-14	On dry stone wall and on fence posts
<i>Ceratodon purpureus</i>	Redshank	Farmland at Foel Fawr south of Tregele	SH356920	17-Sep-14	On rock outcrops
<i>Dicranoweisia cirrata</i>	Common pincushion	Farmland at Foel Fawr south of Tregele	SH356920	17-Sep-14	On rock outcrops
<i>Fissidens taxifolius</i>	Common pocket-moss	Farmland at Foel Fawr south of Tregele	SH356920	17-Sep-14	On rock outcrops
<i>Fissidens viridulus</i>	Green pocket-moss	Farmland at Foel Fawr south of Tregele	SH356920	17-Sep-14	On bare ground by a small ditch
<i>Grimmia trichophylla</i>	Hair-pointed grimmia	Farmland at Foel Fawr south of Tregele	SH356920	17-Sep-14	On rock outcrops
<i>Homalothecium sericeum</i>	Silky wall feather-moss	Farmland at Foel Fawr south of Tregele	SH356920	17-Sep-14	On dry stone wall
<i>Kindbergia praelonga</i>	Common feather-moss	Farmland at Foel Fawr south of Tregele	SH356920	17-Sep-14	-
<i>Polytrichum juniperinum</i>	Juniper haircap	Farmland at Foel Fawr south of Tregele	SH356920	17-Sep-14	On rock outcrops
<i>Pseudotaxiphyllum elegans</i>	Elegant silk-moss	Farmland at Foel Fawr south of Tregele	SH356920	17-Sep-14	On bare ground by a small ditch
<i>Rhynchostegium confertum</i>	Clustered feather-moss	Farmland at Foel Fawr south of Tregele	SH356920	17-Sep-14	On dry stone wall and on fence posts
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	Farmland at Foel Fawr south of Tregele	SH356920	17-Sep-14	On rock outcrops
<i>Tortula muralis</i>	Wall screw-moss	Farmland at Foel Fawr south of Tregele	SH356920	17-Sep-14	On dry stone wall and on fence posts

**Table 12: Site 9 – List of Bryophytes recorded**

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Amblystegium serpens</i>	Creeping feather-moss	Field at Tregele	SH357926	17-Sep-14	On shaded stones on the ground
<i>Barbula convoluta</i>	Lesser bird's-claw beard-moss	Field at Tregele	SH357926	17-Sep-14	On bank by ditch
<i>Barbula unguiculata</i>	Bird's-claw Beard-moss	Field at Tregele	SH357926	17-Sep-14	On bank by ditch
<i>Brachythecium rutabulum</i>	Rough-stalked feather-moss	Field at Tregele	SH357926	17-Sep-14	On shaded stones on the ground
<i>Lophocolea bidentata</i>	Bifid crestwort	Field at Tregele	SH357926	17-Sep-14	On bank by ditch
<i>Oxyrrhynchium hians</i>	Swartz's feather-moss	Field at Tregele	SH357926	17-Sep-14	On shaded stones on the ground
<i>Rhynchostegium confertum</i>	Clustered feather-moss	Field at Tregele	SH357926	17-Sep-14	On bank by ditch

Species	Common Name	Site	Grid Ref	Date	Comment
<i>Tortula muralis</i>	Wall screw-moss	Field at Tregele	SH357926	17-Sep-14	On shaded stones on the ground

**Table 13: Site 10 – List of Bryophytes recorded**

Species	Common Name	Site	Grid Ref	Date	Comment
<i>Barbula convoluta</i>	Lesser bird's-claw beard-moss	Field south of Wylfa Information Centre	SH356929	10-Sep-14	On bare ground disturbed by cattle
<i>Homalothecium sericeum</i>	Silky wall feather-moss	Field south of Wylfa Information Centre	SH356929	10-Sep-14	On dry stone wall
<i>Hypnum cupressiforme</i>	Cypress-leaved plait-moss	Field south of Wylfa Information Centre	SH356929	10-Sep-14	On dry stone wall
<i>Kindbergia praelonga</i>	Common feather-moss	Field south of Wylfa Information Centre	SH356929	10-Sep-14	On soil of shady bank
<i>Mnium hornum</i>	Swan's-neck thyme-moss	Field south of Wylfa Information Centre	SH356929	10-Sep-14	On soil of shady bank
<i>Phaeoceros laevis</i>	Smooth hornwort	Field south of Wylfa Information Centre	SH356929	10-Sep-14	Five plants on bare ground disturbed by cattle
<i>Pleuridium acuminatum</i>	Taper-leaved earth-moss	Field south of Wylfa Information Centre	SH356929	10-Sep-14	On bare ground disturbed by cattle
<i>Pohlia lutescens</i>	Yellow thread-moss	Field south of Wylfa Information Centre	SH356929	10-Sep-14	On soil near pond
<i>Tortula truncata</i>	Common pottia	Field south of Wylfa Information Centre	SH356929	10-Sep-14	On bare ground disturbed by cattle

**Table 14: Site 11 – List of Bryophytes recorded**

Species	Common Name	Site	Grid Ref	Date	Comment
<i>Barbula convoluta</i>	Lesser bird's-claw beard-moss	North of Caerdegog Isaf	SH346926	11-Sep-14	On wall
<i>Brachythecium rutabulum</i>	Rough-stalked feather-moss	North of Caerdegog Isaf	SH346926	11-Sep-14	-
<i>Bryum capillare</i>	Capillary thread-moss	North of Caerdegog Isaf	SH346926	11-Sep-14	-
<i>Campylopus introflexus</i>	Heath star moss	North of Caerdegog Isaf	SH346926	11-Sep-14	On heathy ground close to the house at Caerdegog Isaf
<i>Ceratodon purpureus</i>	Redshank	North of Caerdegog Isaf	SH346926	11-Sep-14	On heathy ground close to the house at Caerdegog Isaf
<i>Frullania dilatata</i>	Dilated scalewort	North of Caerdegog Isaf	SH346926	11-Sep-14	On blackthorn
<i>Homalothecium sericeum</i>	Silky wall feather-moss	North of Caerdegog Isaf	SH346926	11-Sep-14	On elder bark
<i>Hypnum resupinatum</i>	Supine plait-moss	North of Caerdegog Isaf	SH346926	11-Sep-14	On elder bark
<i>Kindbergia praelonga</i>	Common feather-moss	North of Caerdegog Isaf	SH346926	11-Sep-14	-
<i>Lophocolea bidentata</i>	Bifid crestwort	North of Caerdegog Isaf	SH346926	11-Sep-14	On damp ground by ditch
<i>Metzgeria furcata</i>	Forked veilwort	North of Caerdegog Isaf	SH346926	11-Sep-14	On elder bark
<i>Orthotrichum diaphanum</i>	White-tipped bristle-moss	North of Caerdegog Isaf	SH346926	11-Sep-14	On elder bark
<i>Orthotrichum</i> sp. (probably <i>O. affine</i> )	Wood bristle-moss	North of Caerdegog Isaf	SH346926	11-Sep-14	On elder bark - ID not 100% certain without capsules

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Pellia epiphylla</i>	Overleaf pellia	North of Caerdegog Isaf	SH346926	11-Sep-14	On damp ground by ditch
<i>Polytrichum juniperinum</i>	Juniper haircap	North of Caerdegog Isaf	SH346926	11-Sep-14	On heathy ground close to the house at Caerdegog Isaf
<i>Rhynchostegium confertum</i>	Clustered feather-moss	North of Caerdegog Isaf	SH346926	11-Sep-14	On wall
<i>Rhynchostegium murale</i>	Wall feather-moss	North of Caerdegog Isaf	SH346926	11-Sep-14	On elder bark but unusual on trees
<i>Tortula muralis</i>	Wall screw-moss	North of Caerdegog Isaf	SH346926	11-Sep-14	On wall
<i>Zygodon stirtonii</i>	Stirton's yoke-moss	North of Caerdegog Isaf	SH346926	11-Sep-14	On elder bark but unusual on trees

**Table 15: Site 12 – List of Bryophytes recorded**

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Aphanorrhegma patens</i>	Spreading earth-moss	South of Cafnan Farm	SH346928	11-Sep-14	Abundant in a completely dried up pond
<i>Brachythecium rutabulum</i>	Rough-stalked feather-moss	South of Cafnan Farm	SH346928	11-Sep-14	-
<i>Homalothecium sericeum</i>	Silky wall feather-moss	South of Cafnan Farm	SH346928	11-Sep-14	On dry stone walls
<i>Kindbergia praelonga</i>	Common feather-moss	South of Cafnan Farm	SH346928	11-Sep-14	-
<i>Tortula modica</i>	Blunt-fruited pottia	South of Cafnan Farm	SH346928	11-Sep-14	On damp bare soil among rush pasture
<i>Tortula truncata</i>	Common pottia	South of Cafnan Farm	SH346928	11-Sep-14	On damp bare soil among rush pasture

**Table 16: Site 13 – List of Bryophytes recorded**

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Archidium alternifolium</i>	Clay earth-moss	South of Tre'r Gof SSSI	SH356935	11-Sep-14	On broken concrete at site of former house called Tai Hirion
<i>Barbula convoluta</i>	Lesser bird's-claw beard-moss	South of Tre'r Gof SSSI	SH356935	11-Sep-14	On broken concrete at site of former house called Tai Hirion
<i>Brachythecium albicans</i>	Whitish feather-moss	South of Tre'r Gof SSSI	SH356935	11-Sep-14	-
<i>Brachythecium rutabulum</i>	Rough-stalked feather-moss	South of Tre'r Gof SSSI	SH356935	11-Sep-14	-
<i>Bryum capillare</i>	Capillary thread-moss	South of Tre'r Gof SSSI	SH356935	11-Sep-14	On broken concrete at site of former house called Tai Hirion
<i>Bryum pallens</i>	Pale thread-moss	South of Tre'r Gof SSSI	SH356935	11-Sep-14	On broken concrete at site of former house called Tai Hirion
<i>Calliergonella cuspidata</i>	Pointed spear-moss	South of Tre'r Gof SSSI	SH356935	11-Sep-14	On damp track
<i>Ceratodon purpureus</i>	Redshank	South of Tre'r Gof SSSI	SH356935	11-Sep-14	On rocks
<i>Funaria hygrometrica</i>	Common cord-moss	South of Tre'r Gof SSSI	SH356935	11-Sep-14	On broken concrete at site of former house
<i>Grimmia trichophylla</i>	Hair-pointed grimmia	South of Tre'r Gof SSSI	SH356935	11-Sep-14	On rocks
<i>Hedwigia stellata</i>	Starry hoar-moss	South of Tre'r Gof SSSI	SH356935	11-Sep-14	On rocks and growing with <i>Homalothecium sericeum</i>
<i>Homalothecium sericeum</i>	Silky wall feather-moss	South of Tre'r Gof SSSI	SH356935	11-Sep-14	On rocks
<i>Hypnum cupressiforme</i>	Cypress-leaved plait-moss	South of Tre'r Gof SSSI	SH356935	11-Sep-14	On rocks

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Hypnum jutlandicum</i>	Heath plait-moss	South of Tre'r Gof SSSI	SH356935	11-Sep-14	On a wall
<i>Hypnum lacunosum</i> var. <i>lacunosum</i>	Great plait-moss	South of Tre'r Gof SSSI	SH356935	11-Sep-14	On rocks
<i>Polytrichum juniperinum</i>	Juniper haircap	South of Tre'r Gof SSSI	SH356935	11-Sep-14	On rocks
<i>Pseudoscleropodium purum</i>	Neat feather-moss	South of Tre'r Gof SSSI	SH356935	11-Sep-14	-
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	South of Tre'r Gof SSSI	SH356935	11-Sep-14	-
<i>Tortula modica</i>	Blunt-fruited pottia	South of Tre'r Gof SSSI	SH356935	11-Sep-14	On broken concrete at site of former house called Tai Hirion
<i>Tortula truncata</i>	Common pottia	South of Tre'r Gof SSSI	SH356935	11-Sep-14	On broken concrete at site of former house called Tai Hirion

**Table 17: Site 14 – List of Bryophytes recorded**

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Brachythecium albicans</i>	Whitish feather-moss	South of Trwyn Pencarreg	SH341932	18-Sep-14	At base of wall
<i>Calliergon cordifolium</i>	Heart-leaved spear-moss	South of Trwyn Pencarreg	SH341932	18-Sep-14	On ground in wet mire area
<i>Campylopus introflexus</i>	Heath star moss	South of Trwyn Pencarreg	SH341932	18-Sep-14	On rock outcrops
<i>Ceratodon purpureus</i>	Redshank	South of Trwyn Pencarreg	SH341932	18-Sep-14	On rock outcrops
<i>Dicranella heteromalla</i>	Silky forklet-moss	South of Trwyn Pencarreg	SH341932	18-Sep-14	On rock outcrops
<i>Dicranoweisia cirrata</i>	Common pincushion	South of Trwyn Pencarreg	SH341932	18-Sep-14	On rock outcrops
<i>Dicranum scoparium</i>	Broom fork-moss	South of Trwyn Pencarreg	SH341932	18-Sep-14	On rock outcrops
<i>Frullania dilatata</i>	Dilated scalewort	South of Trwyn Pencarreg	SH341932	18-Sep-14	On sallow bark and also on rock outcrops
<i>Frullania tamarisci</i>	Tamarisk scalewort	South of Trwyn Pencarreg	SH341932	18-Sep-14	On rock outcrops
<i>Grimmia trichophylla</i>	Hair-pointed grimmia	South of Trwyn Pencarreg	SH341932	18-Sep-14	On rock outcrops
<i>Homalothecium sericeum</i>	Silky wall feather-moss	South of Trwyn Pencarreg	SH341932	18-Sep-14	On sallow bark and on rocks
<i>Hypnum andoi</i>	Mamillate plait-moss	South of Trwyn Pencarreg	SH341932	18-Sep-14	On sallow bark
<i>Hypnum cypresiforme</i>	Cypress-leaved plait-moss	South of Trwyn Pencarreg	SH341932	18-Sep-14	-
<i>Hypnum resupinatum</i>	Supine plait-moss	South of Trwyn Pencarreg	SH341932	18-Sep-14	On rock outcrops
<i>Isothecium myosuroides</i>	Slender mouse-tail moss	South of Trwyn Pencarreg	SH341932	18-Sep-14	On rock outcrops
<i>Kindbergia praelonga</i>	Common feather-moss	South of Trwyn Pencarreg	SH341932	18-Sep-14	-
<i>Lophocolea bidentata</i>	Bifid crestwort	South of Trwyn Pencarreg	SH341932	18-Sep-14	On rock outcrops
<i>Metzgeria fruticulosa</i>	Blueish veilwort	South of Trwyn Pencarreg	SH341932	18-Sep-14	On sallow bark
<i>Metzgeria furcata</i>	Forked veilwort	South of Trwyn Pencarreg	SH341932	18-Sep-14	On sallow bark
<i>Microlejeunea ulicina</i>	Fairy beads	South of Trwyn Pencarreg	SH341932	18-Sep-14	On sallow bark
<i>Mnium hornum</i>	Swan's-neck thyme-moss	South of Trwyn Pencarreg	SH341932	18-Sep-14	On sallow bark
<i>Orthotrichum</i> sp. (probably <i>O.affine</i> )	Wood bristle-moss	South of Trwyn Pencarreg	SH341932	18-Sep-14	On sallow bark - ID not 100% certain without capsules
<i>Polytrichum juniperinum</i>	Juniper haircap	South of Trwyn Pencarreg	SH341932	18-Sep-14	On rock outcrops
<i>Polytrichum piliferum</i>	Bristly haircap	South of Trwyn Pencarreg	SH341932	18-Sep-14	On rock outcrops
<i>Rhynchostegium megapolitanum</i>	Megopolitan feather-moss	South of Trwyn Pencarreg	SH341932	18-Sep-14	On damp ground under sallows
<i>Ulota phyllantha</i>	Frizzled pincushion	South of Trwyn Pencarreg	SH341932	18-Sep-14	On sallow bark

**Table 18: Site 15 – List of Bryophytes recorded**

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Barbula convoluta</i>	Lesser bird's-claw beard-moss	Southwest of power station	SH348937	17-Sep-14	On the ground
<i>Barbula sardoa</i>	Lesser bird's-claw beard-moss	Southwest of power station	SH348937	17-Sep-14	Very common on the ground at the site of a former house called Tai Hirion
<i>Barbula unguiculata</i>	Bird's-claw beard-moss	Southwest of power station	SH348937	17-Sep-14	On the ground
<i>Brachythecium albicans</i>	Whitish feather-moss	Southwest of power station	SH348937	17-Sep-14	On the ground
<i>Bryum argenteum</i>	Silver-moss	Southwest of power station	SH348937	17-Sep-14	On the ground
<i>Bryum capillare</i>	Capillary thread-moss	Southwest of power station	SH348937	17-Sep-14	On the ground in areas of acid grassland and lichen heath
<i>Bryum pallens</i>	Pale thread-moss	Southwest of power station	SH348937	17-Sep-14	On the ground
<i>Calliergonella cuspidata</i>	Pointed spear-moss	Southwest of power station	SH348937	17-Sep-14	On the ground
<i>Campylopus introflexus</i>	Heath star moss	Southwest of power station	SH348937	17-Sep-14	On the ground in areas of acid grassland and lichen heath
<i>Cephalozia bicuspidata</i>	Two-horned pincerwort	Southwest of power station	SH348937	17-Sep-14	On or very close to the coastal rocks
<i>Ceratodon purpureus</i>	Redshank	Southwest of power station	SH348937	17-Sep-14	On the ground
<i>Dicranoweisia cirrata</i>	Common pincushion	Southwest of power station	SH348937	17-Sep-14	On broken concrete
<i>Didymodon fallax</i>	Fallacious beard-moss	Southwest of power station	SH348937	17-Sep-14	On the ground
<i>Frullania teneriffae</i>	Sea scalewort	Southwest of power station	SH348937	17-Sep-14	On or very close to the coastal rocks
<i>Grimmia trichophylla</i>	Hair-pointed grimmia	Southwest of power station	SH348937	17-Sep-14	On or very close to the coastal rocks
<i>Homalothecium sericeum</i>	Silky wall feather-moss	Southwest of power station	SH348937	17-Sep-14	On or very close to the coastal rocks
<i>Hypnum cupressiforme</i>	Cypress-leaved plait-moss	Southwest of power station	SH348937	17-Sep-14	On the ground in areas of acid grassland and lichen heath
<i>Hypnum jutlandicum</i>	Heath plait-moss	Southwest of power station	SH348937	17-Sep-14	On or very close to the coastal rocks
<i>Hypnum lacunosum</i> var. <i>lacunosum</i>	Great plait-moss	Southwest of power station	SH348937	17-Sep-14	On the ground in areas of acid grassland and lichen heath
<i>Kindbergia praelonga</i>	Common feather-moss	Southwest of power station	SH348937	17-Sep-14	On the ground in areas of acid grassland and lichen heath
<i>Lophocolea bidentata</i>	Bifid crestwort	Southwest of power station	SH348937	17-Sep-14	On a rock outcrop inland
<i>Mnium hornum</i>	Swan's-neck thyme-moss	Southwest of power station	SH348937	17-Sep-14	On or very close to the coastal rocks
<i>Orthotrichum cupulatum</i>	Hooded bristle-moss	Southwest of power station	SH348937	17-Sep-14	On broken concrete and ID proved by the presence of old capsules
<i>Polytrichum juniperinum</i>	Juniper haircap	Southwest of power station	SH348937	17-Sep-14	On the ground in areas of acid grassland and lichen heath
<i>Polytrichum piliferum</i>	Bristly haircap	Southwest of power station	SH348937	17-Sep-14	On the ground in areas of acid grassland and lichen heath
<i>Pseudocrossidium hornschuchianum</i>	HornsChuck's beard-moss	Southwest of power station	SH348937	17-Sep-14	On the ground
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	Southwest of power station	SH348937	17-Sep-14	On or very close to the coastal rocks
<i>Riccardia chamedryfolia</i>	Jagged germanderwort	Southwest of power station	SH348937	17-Sep-14	On or very close to the coastal rocks
<i>Schistidium maritimum</i>	Seaside grimmia	Southwest of power station	SH348937	17-Sep-14	On or very close to the coastal rocks

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Tortella flavovirens</i>	Yellow crisp-moss	Southwest of power station	SH348937	17-Sep-14	On or very close to the coastal rocks
<i>Tortula truncata</i>	Common pottia	Southwest of power station	SH348937	17-Sep-14	On the ground
<i>Trichostomum brachydontium</i>	Variable crisp-moss	Southwest of power station	SH348937	17-Sep-14	On or very close to the coastal rocks

**Table 19: Site 16 – List of Bryophytes recorded**

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Bryum capillare</i>	Capillary thread-moss	Southwest of Swn-y-mor	SH335927	16-Sep-14	On rocky outcrops
<i>Didymodon vinealis</i>	Soft-tufted beard-moss	Southwest of Swn-y-mor	SH335927	16-Sep-14	On rocky outcrops
<i>Frullania tamarisci</i>	Tamarisk scalewort	Southwest of Swn-y-mor	SH335927	16-Sep-14	On rocky outcrops
<i>Homalothecium sericeum</i>	Silky wall feather-moss	Southwest of Swn-y-mor	SH335927	16-Sep-14	On rocky outcrops
<i>Hypnum cupressiforme</i>	Cypress-leaved plait-moss	Southwest of Swn-y-mor	SH335927	16-Sep-14	On rocky outcrops
<i>Hypnum jutlandicum</i>	Heath plait-moss	Southwest of Swn-y-mor	SH335927	16-Sep-14	On rocky outcrops
<i>Isothecium myosuroides</i>	Slender mouse-tail moss	Southwest of Swn-y-mor	SH335927	16-Sep-14	On rocky outcrops
<i>Kindbergia praelonga</i>	Common feather-moss	Southwest of Swn-y-mor	SH335927	16-Sep-14	-
<i>Polytrichum juniperinum</i>	Juniper haircap	Southwest of Swn-y-mor	SH335927	16-Sep-14	On rocky outcrops
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	Southwest of Swn-y-mor	SH335927	16-Sep-14	-
<i>Anthoceros punctatus</i>	Dotted hornwort	Southeast of Swn-y-mor	SH341928	16-Sep-14	1 plant on soil banks by stream
<i>Archidium alternifolium</i>	Clay earth-moss	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil banks by stream
<i>Aulacomnium palustre</i>	Bog groove-moss	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil banks by stream
<i>Brachythecium rutabulum</i>	Rough-stalked feather-moss	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil banks by stream
<i>Bryum pallens</i>	Pale thread-moss	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil banks by stream
<i>Campylopus introflexus</i>	Heath star moss	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil near stream
<i>Ceratodon purpureus</i>	Redshank	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil near stream
<i>Chiloscyphus polyanthos</i>	St. Winifrid's moss	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil banks by stream
<i>Didymodon fallax</i>	Fallacious beard-moss	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil banks by stream
<i>Epipterygium tozeri</i>	Tozer's thread-moss	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil banks by stream
<i>Fossombronia sp. (probably F.pusilla)</i>	Common frillwort	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil banks by stream
<i>Lunularia cruciata</i>	Crescent-cup liverwort	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil banks by stream
<i>Phaeoceros laevis</i>	Smooth hornwort	Southeast of Swn-y-mor	SH341928	16-Sep-14	20+ plants between SH34179285 and SH34169279
<i>Pohlia annotina</i>	Pale-fruited thread-moss	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil banks by stream
<i>Pohlia lutescens</i>	Yellow thread-moss	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil banks by stream
<i>Pohlia melanodon</i>	Pink-fruited thread-moss	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil banks by stream
<i>Rhynchostegiella pumila</i>	Dwarf feather-moss	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil banks by stream
<i>Riccardia chamedryfolia</i>	Jagged germanderwort	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil banks by stream
<i>Tortula truncata</i>	Common pottia	Southeast of Swn-y-mor	SH341928	16-Sep-14	On soil banks by stream

**Table 20: Site 17 – List of Bryophytes recorded**

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Archidium alternifolium</i>	Clay earth-moss	Arable field south of Nanner	SH335918	16-Sep-14	On bare soil in arable field

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Brachythecium rutabulum</i>	Rough-stalked feather-moss	West of Nanner	SH334920	16-Sep-14	By stream
<i>Bryum argenteum</i>	Silver-moss	SW of Nanner	SH329920	16-Sep-14	On soil on rocks
<i>Bryum capillare</i>	Capillary thread-moss	SW of Nanner	SH329920	16-Sep-14	On rock outcrops
<i>Ceratodon purpureus</i>	Redshank	West of Nanner	SH334920	16-Sep-14	On stones by stream
<i>Dicranoweisia cirrata</i>	Common pincushion	SW of Nanner	SH329920	16-Sep-14	On rock outcrops
<i>Frullania tamarisci</i>	Tamarisk scalewort	SW of Nanner	SH329920	16-Sep-14	On rock outcrops
<i>Grimmia trichophylla</i>	Hair-pointed grimmia	SW of Nanner	SH329920	16-Sep-14	On rock outcrops
<i>Homalothecium sericeum</i>	Silky wall feather-moss	SW of Nanner	SH329920	16-Sep-14	On rock outcrops
<i>Hypnum cupressiforme</i>	Cypress-leaved plait-moss	SW of Nanner	SH329920	16-Sep-14	On rock outcrops
<i>Hypnum jutlandicum</i>	Heath plait-moss	SW of Nanner	SH329920	16-Sep-14	On dry wall
<i>Kindbergia praelonga</i>	Common feather-moss	West of Nanner	SH334920	16-Sep-14	By stream
<i>Lophocolea bidentata</i>	Bifid crestwort	SW of Nanner	SH329920	16-Sep-14	On rock outcrops
<i>Metzgeria furcata</i>	Forked veilwort	West of Nanner	SH334920	16-Sep-14	On stones by stream
<i>Orthotrichum anomalum/cupulatum</i>	Anomalous/Hooded bristle-moss	SW of Nanner	SH329920	16-Sep-14	On rock outcrops - ID not 100% certain without capsules
<i>Oxyrrhynchium hians</i>	Swartz's feather-moss	Arable field south of Nanner	SH335918	16-Sep-14	In ditch by lane
<i>Phaeoceros laevis</i>	Smooth hornwort	Arable field south of Nanner	SH335918	16-Sep-14	On bare soil in arable field in small quantity
<i>Pohlia annotina</i>	Pale-fruited thread-moss	Arable field south of Nanner	SH335918	16-Sep-14	On bare soil in arable field
<i>Pohlia melanodon</i>	Pink-fruited thread-moss	West of Nanner	SH334920	16-Sep-14	By stream
<i>Polytrichum juniperinum</i>	Juniper haircap	SW of Nanner	SH329920	16-Sep-14	On rock outcrops
<i>Polytrichum piliferum</i>	Bristly haircap	SW of Nanner	SH329920	16-Sep-14	On rock outcrops
<i>Rhytidiodelphus squarrosus</i>	Springy turf-moss	SW of Nanner	SH329920	16-Sep-14	On rock outcrops
<i>Tortula truncata</i>	Common pottia	SW of Nanner	SH329920	16-Sep-14	On soil on rocks
<i>Tortula truncata</i>	Common pottia	Arable field south of Nanner	SH335918	16-Sep-14	On bare soil in arable field
<i>Ulota phyllantha</i>	Frizzled pincushion	SW of Nanner	SH329920	16-Sep-14	On rock outcrops

**Table 21: Site 18 – List of Bryophytes recorded**

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Archidium alternifolium</i>	Clay earth-moss	West of A5025 at Tregele	SH351920	11-Sep-14	In damp area poached by cattle west of the pine plantation
<i>Barbula convoluta</i>	Lesser bird's-claw beard-moss	West of A5025 at Tregele	SH351920	11-Sep-14	In damp area poached by cattle west of the pine plantation
<i>Brachythecium albicans</i>	Whitish feather-moss	West of A5025 at Tregele	SH351920	11-Sep-14	In damp area poached by cattle west of the pine plantation
<i>Bryum argenteum</i>	Silver-moss	West of A5025 at Tregele	SH351920	11-Sep-14	In damp area poached by cattle west of the pine plantation

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Bryum capillare</i>	Capillary thread-moss	West of A5025 at Tregele	SH351920	11-Sep-14	On rocks
<i>Campylopus introflexus</i>	Heath star moss	West of A5025 at Tregele	SH351920	11-Sep-14	On pine bark and on acid rocks
<i>Ceratodon purpureus</i>	Redshank	West of A5025 at Tregele	SH351920	11-Sep-14	On rocks
<i>Dicranella heteromalla</i>	Silky forklet-moss	West of A5025 at Tregele	SH351920	11-Sep-14	On pine bark
<i>Didymodon fallax</i>	Fallacious beard-moss	West of A5025 at Tregele	SH351920	11-Sep-14	In damp area poached by cattle west of the pine plantation
<i>Didymodon insulanus</i>	Cylindric beard-moss	North of Cae Gwyn	SH349918	11-Sep-14	-
<i>Homalothecium sericeum</i>	Silky wall feather-moss	West of A5025 at Tregele	SH351920	11-Sep-14	On dry stone walls and rocks
<i>Hypnum cupressiforme</i>	Cypress-leaved plait-moss	West of A5025 at Tregele	SH351920	11-Sep-14	On rocks, walls and on pine bark
<i>Hypnum jutlandicum</i>	Heath plait-moss	West of A5025 at Tregele	SH351920	11-Sep-14	On pine bark and on acid rocks
<i>Kindbergia praelonga</i>	Common feather-moss	West of A5025 at Tregele	SH351920	11-Sep-14	-
<i>Pellia epiphylla</i>	Overleaf pellia	West of A5025 at Tregele	SH351920	11-Sep-14	In damp area poached by cattle west of the pine plantation
<i>Pleuridium acuminatum</i>	Taper-leaved earth-moss	West of A5025 at Tregele	SH351920	11-Sep-14	On bare ground in arable field
<i>Pohlia melanodon</i>	Pink-fruited thread-moss	West of A5025 at Tregele	SH351920	11-Sep-14	In damp area poached by cattle west of the pine plantation
<i>Polytrichum juniperinum</i>	Juniper haircap	North of Cae Gwyn	SH349918	11-Sep-14	-
<i>Polytrichum piliferum</i>	Bristly haircap	North of Cae Gwyn	SH349918	11-Sep-14	-
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	West of A5025 at Tregele	SH351920	11-Sep-14	On rocks
<i>Riccardia chamedryfolia</i>	Jagged germanderwort	West of A5025 at Tregele	SH351920	11-Sep-14	In damp area poached by cattle west of the pine plantation
<i>Tortula truncata</i>	Common pottia	West of A5025 at Tregele	SH351920	11-Sep-14	In damp area poached by cattle west of the pine plantation

**Table 22: Site 19 – List of Bryophytes recorded**

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Archidium alternifolium</i>	Clay earth-moss	Wylfa Head - east	SH356944	09-Sep-14	-
<i>Brachythecium albicans</i>	Whitish feather-moss	Wylfa Head - east	SH356944	09-Sep-14	-
<i>Brachythecium populeum</i>	Matted feather-moss	Wylfa Head - east	SH356944	09-Sep-14	On damp and shady rocks
<i>Bryum pallens</i>	Pale thread-moss	Wylfa Head - east	SH356944	09-Sep-14	-
<i>Bryum pseudotriquetrum</i>	Marsh bryum	Wylfa Head - west	SH352943	09-Sep-14	Wet flushes
<i>Calliergonella cuspidata</i>	Pointed spear-moss	Wylfa Head - west	SH352943	09-Sep-14	Wet flushes
<i>Campylium stellatum</i>	Yellow starry feather-moss	Wylfa Head - west	SH352943	09-Sep-14	Wet flushes
<i>Campylopus introflexus</i>	Heath star moss	Wylfa Head - east	SH356944	09-Sep-14	Only seen by old coastguard station
<i>Ceratodon purpureus</i>	Redshank	Wylfa Head - east	SH356944	09-Sep-14	-
<i>Ceratodon purpureus</i>	Redshank	Wylfa Head - west	SH352943	09-Sep-14	Wet flushes
<i>Chiloscyphus polyanthos</i>	St. Winifrid's moss	Wylfa Head - east	SH356944	09-Sep-14	On damp and shady rocks
<i>Dicranella heteromalla</i>	Silky forklet-moss	Wylfa Head - east	SH356944	09-Sep-14	-
<i>Dicranoweisia cirrata</i>	Common pincushion	Wylfa Head - east	SH356944	09-Sep-14	On rocks
<i>Entosthodon attenuatus</i>	Thin cord-moss	Wylfa Head - west	SH352943	09-Sep-14	Wet flushes
<i>Frullania teneriffae</i>	Sea scalewort	Wylfa Head - east	SH356944	09-Sep-14	On rocks

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Homalothecium sericeum</i>	Silky wall feather-moss	Wylfa Head - east	SH356944	09-Sep-14	On rocks
<i>Hypnum cupressiforme</i>	Cypress-leaved plait-moss	Wylfa Head - east	SH356944	09-Sep-14	-
<i>Jungermannia pumila</i>	Dwarf flapwort	Wylfa Head - east	SH356944	09-Sep-14	On damp and shady rocks
<i>Kindbergia praelonga</i>	Common feather-moss	Wylfa Head - east	SH356944	09-Sep-14	-
<i>Mnium hornum</i>	Swan's-neck thyme-moss	Wylfa Head - east	SH356944	09-Sep-14	-
<i>Pellia endiviifolia</i>	Endive pellia	Wylfa Head - west	SH352943	09-Sep-14	Wet flushes
<i>Pellia epiphylla</i>	Overleaf pellia	Wylfa Head - west	SH352943	09-Sep-14	Wet flushes
<i>Polytrichum juniperinum</i>	Juniper haircap	Wylfa Head - east	SH356944	09-Sep-14	-
<i>Riccardia chamedryfolia</i>	Jagged germanderwort	Wylfa Head - west	SH352943	09-Sep-14	Wet flushes
<i>Schistidium maritimum</i>	Seaside grimmia	Wylfa Head - east	SH356944	09-Sep-14	On rocks
<i>Trichostomum brachydontium</i>	Variable crisp-moss	Wylfa Head - east	SH356944	09-Sep-14	On rocks

**Table 23: Site 20 – List of Bryophytes recorded**

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Bryum capillare</i>	Capillary thread-moss	Wylfa Information Centre - bank by road	SH354932	10-Sep-14	-
<i>Calliergonella cuspidata</i>	Pointed spear-moss	Wylfa Information Centre - bank by road	SH354932	10-Sep-14	-
<i>Polytrichum juniperinum</i>	Juniper haircap	Wylfa Information Centre - bank by road	SH354932	10-Sep-14	-
<i>Pseudoscleropodium purum</i>	Neat feather-moss	Wylfa Information Centre - bank by road	SH354932	10-Sep-14	-
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	Wylfa Information Centre - bank by road	SH354932	10-Sep-14	-

**Table 24: Site 21 – List of Bryophytes recorded**

<b>Species</b>	<b>Common Name</b>	<b>Site</b>	<b>Grid Ref</b>	<b>Date</b>	<b>Comment</b>
<i>Amblystegium serpens</i>	Creeping feather-moss	Wylfa Social Club	SH353932	10-Sep-14	On the ground in woodland area
<i>Barbula unguiculata</i>	Bird's-claw beard-moss	Wylfa Social Club	SH353932	10-Sep-14	On wall along access road
<i>Brachythecium rutabulum</i>	Rough-stalked feather-moss	Wylfa Social Club	SH353932	10-Sep-14	On the ground in woodland area
<i>Didymodon vinealis</i>	Soft-tufted beard-moss	Wylfa Social Club	SH353932	10-Sep-14	On wall along access road
<i>Fissidens bryoides</i>	Lesser pocket-moss	Wylfa Social Club	SH353932	10-Sep-14	On the ground in woodland area
<i>Frullania dilatata</i>	Dilated scalewort	Wylfa Social Club	SH353932	10-Sep-14	On sycamore bark
<i>Homalothecium sericeum</i>	Silky wall feather-moss	Wylfa Social Club	SH353932	10-Sep-14	On wall along access road
<i>Hypnum cupressiforme</i>	Cypress-leaved plait-moss	Wylfa Social Club	SH353932	10-Sep-14	On sycamore bark
<i>Kindbergia praelonga</i>	Common feather-moss	Wylfa Social Club	SH353932	10-Sep-14	On the ground in woodland area
<i>Metzgeria furcata</i>	Forked veilwort	Wylfa Social Club	SH353932	10-Sep-14	On sycamore bark
<i>Mnium hornum</i>	Swan's-neck thyme-moss	Wylfa Social Club	SH353932	10-Sep-14	On the ground in woodland area
<i>Orthotrichum anomalum/cupulatum</i>	Anomalous/Hooded bristle-moss	Wylfa Social Club	SH353932	10-Sep-14	On wall along access road - ID not 100% certain without capsules
<i>Oxyrrhynchium hians</i>	Swartz's feather-moss	Wylfa Social Club	SH353932	10-Sep-14	On the ground in woodland area

Species	Common Name	Site	Grid Ref	Date	Comment
<i>Plagiommium undulatum</i>	Hart's-tongue thyme-moss	Wylfa Social Club	SH353932	10-Sep-14	On the ground in woodland area
<i>Pseudocrossidium hornschuchianum</i>	HornsChuck's beard-moss	Wylfa Social Club	SH353932	10-Sep-14	On wall along access road
<i>Rhynchostegiella tenella</i>	Tender feather-moss	Wylfa Social Club	SH353932	10-Sep-14	On wall along access road
<i>Rhynchostegium confertum</i>	Clustered feather-moss	Wylfa Social Club	SH353932	10-Sep-14	On the ground in woodland area
<i>Rhytidadelphus squarrosus</i>	Springy turf-moss	Wylfa Social Club	SH353932	10-Sep-14	On the ground in woodland area
<i>Tortula muralis</i>	Wall screw-moss	Wylfa Social Club	SH353932	10-Sep-14	On wall along access road

## Appendix C Species List Recorded by Taxon<sup>3</sup>

Table 25: List of acrocarpous moss recorded in study area

Acrocarpous Mosses				
Scientific Name	Synonym as recorded by Mapmate if different	Common Name	Abundance on site	Status on Anglesey (from Hill <i>et al.</i> , 1994)
<i>Aphanorrhegma patens</i>	-	Spreading earth-moss	Rare (one dried up pond but abundant there)	Rare (as <i>Physcomitrella patens</i> )
<i>Archidium alternifolium</i>	-	Clay earth-moss	Common	Common
<i>Aulacomnium palustre</i>	-	Bog groove-moss	Occasional (very wet areas)	Common
<i>Barbula convoluta</i>	<i>Barbula convoluta</i> var. <i>convoluta</i>	Lesser bird's-claw beard-moss	Common	Common
<i>Barbula sardoa</i>	<i>Barbula convoluta</i> var. <i>sardoa</i>	Lesser bird's-claw beard-moss	Rare (sites of former buildings)	Not mapped in (Hill <i>et al.</i> , 1994)
<i>Barbula unguiculata</i>	-	Bird's-claw Beard-moss	Common	Common
<i>Bryum alpinum</i>	-	Alpine thread-moss	Rare (on coast near Cestyll Gardens)	Local
<i>Bryum argenteum</i>	-	Silver-moss	Common	Common
<i>Bryum</i> sp. (probably <i>B.caespiticium</i> )	-	Tufted thread-moss	Frequent	Rare
<i>Bryum capillare</i>	-	Capillary thread-moss	Very common	Common
<i>Bryum pallens</i>	-	Pale thread-moss	Frequent	Common
<i>Bryum pseudotriquetrum</i>	-	Marsh bryum	Frequent (in wet flushes)	Common
<i>Campylopus flexuosus</i>	-	Rusty swan-neck moss	Occasional (in acidic areas)	Common (as <i>C.flexuosus</i> )
<i>Campylopus introflexus</i>	-	Heath star moss	Very common (in acidic areas)	Common
<i>Ceratodon purpureus</i>	-	Redshank	Very common	Common
<i>Dichodontium palustre</i>	-	Marsh forklet-moss	Rare (in coastal wet flushes)	Rare (as <i>Dicranella palustris</i> )
<i>Dicranella heteromalla</i>	-	Silky forklet-moss	Frequent	Common
<i>Dicranoweisia cirrata</i>	-	Common pincushion	Common	Common
<i>Dicranum scoparium</i>	-	Broom fork-moss	Common	Common

<sup>3</sup> Scientific names highlighted in bold indicate a species has a rare or local status on Anglesey (after Hill *et al.*, 1994).

Acrocarpous Mosses				
Scientific Name	Synonym as recorded by Mapmate if different	Common Name	Abundance on site	Status on Anglesey (from Hill <i>et al.</i> , 1994)
<i>Didymodon fallax</i>	-	Fallacious beard-moss	Common	Common
<i>Didymodon insulanus</i>	-	Cylindric beard-moss	Frequent	Common (as <i>Barbula fallax</i> )
<i>Didymodon luridus</i>	-	Dusky beard-moss	Rare	Local (in SE) (as <i>Barbula trifaria</i> )
<i>Didymodon vinealis</i>	-	Soft-tufted beard-moss	Frequent	Common (as <i>Barbula vinealis</i> )
<i>Ditrichum heteromallum</i>	-	Curve-leaved ditrichum	Rare	Rare
<i>Entosthodon attenuates</i>	-	Thin cord-moss	Rare (in coastal wet flushes)	Local (coastal) (as <i>Funaria attenuata</i> )
<i>Entosthodon obtusus</i>	-	Blunt cord-moss	Rare (in coastal wet flushes)	Local (as <i>Funaria obtusa</i> )
<i>Epipterygium tozeri</i>	-	Tozer's thread-moss	Rare (on cattle poached stream sides)	Local (mainly northern half)
<i>Fissidens bryoides</i>	<i>Fissidens bryoides sens. Lat.</i>	Lesser pocket-moss	Occasional	Common
<i>Fissidens limbatus</i>	<i>Fissidens crispus</i>	Herzog's pocket-moss	Rare (by one inland ditch)	Not recorded in (Hill <i>et al.</i> , 1994)
<i>Fissidens taxifolius</i>	-	Common pocket-moss	Occasional	Common
<i>Fissidens viridulus</i>	-	Green pocket-moss	Occasional	Local
<i>Funaria hygrometrica</i>	-	Common cord-moss	Rare (sites of former buildings)	Common
<i>Grimmia hartmanii</i>	-	Hartman's grimmia	Rare (Cestyll Gardens on wet rocks)	Rare (one site in south)
<i>Grimmia pulvinata</i>	-	Grey-cushioned grimmia	Frequent (on walls)	Common
<i>Grimmia trichophylla</i>	-	Hair-pointed grimmia	Very common (on rock outcrops)	Common
<i>Hedwigia stellate</i>	-	Starry hoar-moss	Occasional (on rocks)	Common (mapped as <i>H. ciliata</i> )
<i>Mnium hornum</i>	-	Swan's-neck thyme-moss	Very common	Common
<i>Orthotrichum</i> sp. (probably <i>O. affine</i> )	-	Wood bristle-moss	Common	Common
<i>Orthotrichum anomalum/cupulatum/rupestre</i>	-	Anomalous/Hooded bristle-moss	Common	Local to common
<i>Orthotrichum cupulatum</i>	-	Hooded bristle-moss	Frequent or common	Local
<i>Orthotrichum diaphanum</i>	-	White-tipped bristle-moss	Frequent (on trees)	Common
<i>Plagiognium undulatum</i>	-	Hart's-tongue thyme-moss	Occasional	Common
<i>Pleuridium acuminatum</i>	-	Taper-leaved earth-moss	Frequent	Common

Acrocarpous Mosses				
Scientific Name	Synonym as recorded by Mapmate if different	Common Name	Abundance on site	Status on Anglesey (from Hill <i>et al.</i> , 1994)
			(on bare ground)	
<i>Pohlia annotina</i>	-	Pale-fruited thread-moss	Occasional (damp, bare ground)	Common
<i>Pohlia lutescens</i>	-	Yellow thread-moss	Frequent (on damp, bare ground)	Local
<i>Pohlia melanodon</i>	-	Pink-fruited thread-moss	Common	Common
<i>Polytrichum juniperinum</i>	-	Juniper haircap	Very common (in acidic areas)	Common
<i>Polytrichum piliferum</i>	-	Bristly haircap	Common (in acid areas)	Common
<i>Pseudocrossidium hornschuchianum</i>	-	Hornschuch's beard-moss	Frequent	Common (as <i>Barbula hornschuchiana</i> )
<i>Pseudocrossidium revolutum</i>	-	Revolute beard-moss	Rare	Common (as <i>Barbula revoluta</i> )
<i>Rhizomnium punctatum</i>	-	Dotted thyme-moss	Rare (Cestyll Gardens)	Local
<i>Schistidium maritimum</i>	-	Seaside grimmia	Very common (on coastal rocks)	Common (coastal)
<i>Tortella flavovirens</i>	-	Yellow crisp-moss	Occasional (on the coast)	Common (coastal)
<i>Tortula modica</i>	-	Blunt-fruited pottia	Frequent (bare ground)	Rare (as <i>Tortula intermedia</i> )
<i>Tortula muralis</i>	-	Wall screw-moss	Very common	Common
<i>Tortula truncata</i>	-	Common pottia	Common (on bare ground)	Common
<i>Trichostomum brachydontium</i>	-	Variable crisp-moss	Very common (on the coast)	Common
<i>Trichostomum crispulum</i>	-	Curly crisp-moss	Rare or occasional	Common
<i>Ulota bruchii</i>	-	Bruch's pincushion	Occasional (on trees)	Common (mapped as <i>U.crispa</i> )
<i>Ulota phyllantha</i>	-	Frizzled pincushion	Very common (on trees especially sallow)	Common
<i>Zygodon stirtonii</i>	<i>Zygodon viridissimus</i> var. <i>stirtonii</i>	Stirton's yoke-moss	Rare (unusually on elder tree bark at one site)	Local

Table 26: List of pleurocarpous moss recorded in study area.

Pleurocarpous Mosses				
Scientific Name	Synonym as recorded by Mapmate if different	Common Name	Abundance on site	Status on Anglesey (from Hill <i>et al.</i> , 1994)
<i>Amblystegium serpens</i>	-	Creeping feather-moss	Frequent	Common
<b>Anomodon viticulosus</b>	-	Rambling tail-moss	Rare (but common in Cestyll Gardens)	Local (mainly in the east)
<i>Brachythecium albicans</i>	-	Whitish feather-moss	Very common	Common
<b>Brachythecium populeum</b>	<i>Sciuro-hypnum populeum</i>	Matted feather-moss	Rare (on the coast)	Local (mainly in the south)
<i>Brachythecium rutabulum</i>	-	Rough-stalked feather-moss	Common	Common
<b>Calliergon cordifolium</b>	-	Heart-leaved spear-moss	Frequent (in very wet habitats)	Local
<i>Calliergonella cuspidate</i>	-	Pointed spear-moss	Common	Common
<i>Campylium stellatum</i>	-	Yellow starry feather-moss	Frequent (in very wet habitats)	Common (mainly coastal)
<b>Cirriphyllum piliferum</b>	-	Hair-pointed feather-moss	Rare (on the coast)	Local
<i>Cratoneuron filicinum</i>	-	Fern-leaved hook-moss	Frequent (in very wet habitats)	Common
<i>Fontinalis antipyretica</i>	-	Greater water-moss	Rare (in and near Cestyll Gardens only)	Common
<i>Homalothecium sericeum</i>	-	Silky wall feather-moss	Very common	Common
<b>Hypnum andoi</b>	-	Mammillate plait-moss	Common	Local (as <i>H.mammillatum</i> )
<i>Hypnum cupressiforme</i>	-	Cypress-leaved plait-moss	Very common	Common
<i>Hypnum lacunosum</i> var. <i>lacunosum</i>	<i>Hypnum cupressiforme</i> var. <i>lacunosum</i>	Great plait-moss	Common	Mapped under <i>H.cupressiforme</i>
<i>Hypnum resupinatum</i>	<i>Hypnum cupressiforme</i> var. <i>resupinatum</i>	Supine plait-moss	Common	Mapped under <i>H.cupressiforme</i>
<i>Hypnum jutlandicum</i>	-	Heath plait-moss	Very common (in acidic areas)	Common (mainly coastal)
<i>Isothecium myosuroides</i>	-	Slender mouse-tail moss	Occasional	Common
<i>Kindbergia praelonga</i>	-	Common feather-moss	Very common	Common (as <i>Eurhynchium praelongum</i> )
<i>Oxyrrhynchium hians</i>	-	Swartz's feather-moss	Frequent	Common (as <i>Eurhynchium swartzii</i> )
<b>Platyhypnidium ripariooides</b>	-	Long-beaked water feather-moss	Rare (but common in Cestyll Gardens)	Local (as <i>Rhyncostegium ripariooides</i> )
<i>Pseudoscleropodium purum</i>	-	Neat feather-moss	Frequent	Common
<i>Pseudotaxiphyllum elegans</i>	-	Elegant silk-moss	Occasional	Common (as <i>Isopterygium elegans</i> )
<b>Rhynchostegiella pumila</b>	<i>Oxyrrhynchium pumilum</i>	Dwarf feather-moss	Rare	Local (as <i>Eurhynchium pumilum</i> )

Pleurocarpous Mosses				
Scientific Name	Synonym as recorded by Mapmate if different	Common Name	Abundance on site	Status on Anglesey (from Hill <i>et al.</i> , 1994)
<i>Rhynchostegiella tenella</i>	-	Tender feather-moss	Rare	Common
<i>Rhynchostegium confertum</i>	-	Clustered feather-moss	Common	Common
<i>Rhynchostegium megapolitanum</i>	-	Megapolitan feather-moss	Rare (two sites, one untypical habitat)	Rare
<i>Rhynchostegium murale</i>	-	Wall feather-moss	Rare (unusually on elder tree bark at one site)	Local
<i>Rhytidadelphus squarrosus</i>	-	Springy turf-moss	Very common	Common
<i>Thamnobryum alopecurum</i>	-	Fox-tail feather-moss	Occasional	Local (mainly in the east)

Table 27: List of sphagnale mosses recorded in study area

Sphagnales – Sphagnum mosses				
Scientific Name	Synonym as recorded by Mapmate if different	Common Name	Abundance on site	Status on Anglesey (from Hill <i>et al.</i> , 1994)
<i>Sphagnum denticulatum</i>	-	Cow-horn bog-moss	Occasional (very wet areas)	Common (as <i>S.auriculatum</i> )
<i>Sphagnum inundatum</i>	-	Lesser cow-horn bog-moss	Occasional (very wet areas)	Common (as <i>S.auriculatum</i> )
<i>Sphagnum subnitens</i> var. <i>subnitens</i>	-	Lustrous bog-moss	Occasional (very wet areas)	Common

Table 28: List of anthocerotale hornworts recorded in study area

Anthocerotales – Hornworts				
Scientific Name	Synonym as recorded by Mapmate if different	Common Name	Abundance on site	Status on Anglesey (from Hill <i>et al.</i> , 1994)
<i>Anthoceros punctatus</i>	-	Dotted hornwort	Rare (on cattle poached stream sides)	Rare
<i>Phaeoceros laevis</i>	-	Smooth hornwort	Frequent (on bare ground)	Common

Table 29: List of metzgeriale hornworts recorded in study area

Metzgeriales/Marchantiales (Thallous Liverworts)				
Scientific Name	Synonym as recorded by Mapmate if different	Common Name	Abundance on site	Status on Anglesey (from Hill <i>et al.</i> , 1994)
<i>Fossumbronia</i> sp. ( <i>probably F. incurva</i> )	-	Weedy frillwort	Common (in suitable habitats)	Common
<i>Fossumbronia</i> sp. ( <i>probably F. pusilla</i> )	-	Common frillwort	Occasional	Not recorded in (Hill <i>et al.</i> , 1994)

Metzgeriales/Marchantiales (Thallous Liverworts)				
Scientific Name	Synonym as recorded by Mapmate if different	Common Name	Abundance on site	Status on Anglesey (from Hill <i>et al.</i> , 1994)
<i>Lunularia cruciata</i>	-	Crescent-cup liverwort	Frequent	Common
<i>Metzgeria fruticulosa</i>	<i>Metzgeria violacea</i>	Blueish veilwort	Rare or occasional	Rare
<i>Metzgeria furcate</i>	-	Forked veilwort	Frequent (both on trees and rocks)	Common
<i>Pellia endiviifolia</i>	-	Endive pellia	Rare or occasional	Common
<i>Pellia epiphylla</i>	-	Overleaf pellia	Common (in suitable habitats)	Common
<i>Riccardia chamedryfolia</i>	-	Jagged germanderwort	Common (in suitable habitats)	Common

Table 30: List of jungermanniale hornworts recorded in study area

Jungermanniales – Leafy Liverworts				
Scientific Name	Synonym as recorded by Mapmate if different	Common Name	Abundance on site	Status on Anglesey (from Hill <i>et al.</i> , 1994)
<i>Calypogeia argute</i>	-	Notched pouchwort	Occasional (on coast)	Local (coastal)
<i>Calypogeia fissa</i>	-	Common pouchwort	Frequent (mainly on the coast)	Common
<i>Calypogeia muelleriana</i>	-	Mueller's pouchwort	Frequent (mainly on the coast)	Local
<i>Cephalozia bicuspidate</i>	-	Two-horned pincerwort	Common	Common
<i>Cephaloziella hampeana</i>	-	Hampe's threadwort	Occasional	Local
<i>Chiloscyphus polyanthus</i>	-	St. Winifrid's moss	Occasional	Local
<i>Cololejeunea minutissima</i>	-	Minute pouncewort	Common (on trees)	Local
<i>Frullania dilatata</i>	-	Dilated scalewort	Common	Common
<i>Frullania tamarisci</i>	-	Tamarisk scalewort	Common	Common
<i>Frullania teneriffae</i>	-	Sea scalewort	Common (near coast)	Local (coastal)
<i>Jungermannia gracillima</i>	<i>Solenostoma gracillimum</i>	Crenulated flapwort	Occasional (on coast)	Local (mainly coastal)
<i>Jungermannia pumila</i>	-	Dwarf flapwort	Frequent (near coast)	Rare (coastal)
<i>Lejeunea lamacerina</i>	-	Western pouncewort	Rare (Cestyll Gardens)	Local (mainly eastern side)
<i>Lophocolea bidentata</i>	-	Bifid crestwort	Common	Common
<i>Lophocolea fragrans</i>	-	Fragrant crestwort	Rare (but common at Cestyll Gardens)	Rare (only SE corner)
<i>Microlejeunea ulicina</i>	-	Fairy beads	Common (on trees)	Local
<i>Nardia scalaris</i>	-	Ladder flapwort	Frequent (near coast)	Local
<i>Plagiochila killarniensis</i>	<i>Plagiochila bifaria</i>	Killarney featherwort	Rare (on coast)	Local
<i>Ptilidium ciliare</i>	-	Ciliated fringewort	Rare	Common

## Jungermanniales – Leafy Liverworts

Scientific Name	Synonym as recorded by Mapmate if different	Common Name	Abundance on site	Status on Anglesey (from Hill <i>et al.</i> , 1994)
			(on rocks near coast)	
<i>Radula complanata</i>	-	Even scalewort	Occasional (on trees)	Local
<i>Scapania irrigua</i>	-	Heath earwort	Rare (Cestyll Gardens)	Local
<i>Scapania undulata</i>	-	Water earwort	Rare (Cestyll Gardens)	Local

---

**Site Preparation and Clearance  
Environmental Statement  
Volume 3 – Appendix 14-07  
Consultancy Report: Terrestrial  
Invertebrates Technical Summary Report**

---

[This page is intentionally blank]



## Wylfa Newydd Project

Horizon Nuclear Power (Wylfa) Ltd

### Terrestrial Invertebrate Technical Summary Report

60PO8032/TER/REP/007 | 1

WN034-JAC-PAC-REP-00009

#### Document history and status

Revision	Date	Description	By	Review	Approved
		Terrestrial Invertebrate Technical Summary	Jonathan Jackson	Dave Jones	
1	16/12/15	Minor edits following proof read	Suzanne Jenkins	Jonathan Jackson	Rob Bromley
2	05/06/17	Minor edits following HNP review	Jonathan Jackson	Nick Clark	

#### Distribution of copies

Revision	Issue approved	Date issued	Issued to	Comments

## **Wylfa Newydd**

Project no: 60PO8032  
Document title: Terrestrial Invertebrate Technical Summary Report  
Document No.: 60PO8032/TER/REP/007  
Revision: 1  
Date: 16 December 2015  
Client name: Horizon Nuclear Power (Wylfa) Ltd  
Client no: WN034-JAC-PAC-REP-00009  
Project manager: Robert Bromley  
Author: Jonathan Jackson  
File name: P:\\$PROJECTS\\$B1496000 Wylfa Marine Services\6. Reports\Jacobs 2015 Technical Summary Reports\60PO8032 Wylfa Terrestrial Invertebrate Technical Summary Report 2015 issued to RB\_after proof read.docx

Jacobs U.K. Limited

Kenneth Dibben House  
Enterprise Road, Southampton Science Park  
Chilworth, Southampton SO16 7NS  
United Kingdom  
T +44 (0)23 8011 1250  
F +44 (0)23 8011 1251  
[www.jacobs.com](http://www.jacobs.com)

© Copyright 2015 Jacobs U.K. Limited. The concepts and information contained in this document are the property of Jacobs. Use or copying of this document in whole or in part without the written permission of Jacobs constitutes an infringement of copyright.

Limitation: This report has been prepared on behalf of, and for the exclusive use of Jacobs' Client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

## Contents

<b>Executive Summary.....</b>	<b>4</b>
<b>1. Introduction.....</b>	<b>5</b>
1.1 Overview.....	5
1.2 Wylfa Newydd Project .....	5
1.3 Site Description .....	5
1.4 Report Aims and Objectives .....	6
1.5 Previous Work .....	6
1.6 Legal Status.....	6
1.6.1 Natural Environment and Rural Communities (NERC) Act 2006 .....	6
1.6.2 UK Post 2010 Biodiversity Framework.....	6
1.6.3 Conservation Classification of Nationally Rare/Scarce/Notable species .....	7
1.6.4 Local Species .....	7
1.6.5 Red Data Book Species .....	7
<b>2. Field Study Methodology.....</b>	<b>8</b>
2.1 Survey Locations .....	8
2.2 Desktop Study .....	8
2.3 Sampling Methods.....	8
2.4 Survey Seasons .....	9
2.5 Quality Control.....	9
2.6 Limitations .....	9
<b>3. Results.....</b>	<b>10</b>
3.1 Desktop Study .....	10
3.1.1 Red Data Book Species .....	11
3.1.2 Section 42 NERC Act Species .....	11
3.1.3 Local Biodiversity Action Plan Species .....	11
3.1.4 Study Area Descriptions and Total Numbers of Species Recorded .....	11
<b>4. Discussion .....</b>	<b>18</b>
4.1 Notable Species .....	18
4.1.1 Grayling – <i>Hipparchia semele</i> .....	18
4.1.2 Small heath - <i>Coenonympha pamphilus</i> .....	18
4.1.3 Wall brown – <i>Lasiommata merera</i> .....	19
4.1.4 Cinnabar moth – <i>Tyria jacobaeae</i> .....	19
4.1.5 Non-Anglesey LBAP Species .....	19
4.2 Assessing the value of the survey areas for invertebrates.....	20
4.3 Habitats .....	22
4.4 Site Comparisons .....	22
4.5 Habitat and Invertebrate Family Comparisons .....	24
<b>5. Conclusions and Recommendations .....</b>	<b>25</b>
<b>6. References .....</b>	<b>26</b>
<b>Appendix A: Figures.....</b>	<b>27</b>

<b>Appendix B: Notable Species Returned from Background Data.....</b>	<b>29</b>
<b>Appendix C: Notable Species Recorded in the Study Area – All years .....</b>	<b>31</b>

## Executive Summary

Horizon Nuclear Power Wylfa Ltd. (Horizon) is currently planning to develop a new nuclear power station on Anglesey (the Wylfa Newydd Generating Station) as identified in the National Policy Statement for Nuclear Power Generation (EN-6). The Wylfa Newydd Project (the Project) will require a number of applications to be made under different legislation to different regulators. Jacobs UK Ltd (Jacobs) was commissioned to collect baseline data to inform the various applications, assessments and permits that will be submitted for approval to construct and operate the Wylfa Newydd Generating Station.

Terrestrial invertebrates were identified as a potentially significant ecological receptor that could be affected by the Wylfa Newydd Project. Baseline data was therefore required from surveys and a review of background information sources.

The study area has been surveyed for invertebrates over a period of four years (2011 to 2014) using a wide variety of different survey methods, including a background data search of records within a 2.5km radius. The amount of data available is therefore considered to be sufficient to inform an accurate impact assessment for the Project.

Survey data from 17 different sites within the study area recorded a total of 717 species, 88 of which are notable (i.e. species listed on Section 42 of the Natural Environment and Rural Communities Act (NERC) or species that are classified as nationally 'rare' or 'scarce'). This ratio gives a site quality index (SQI) score of 5.3, making it unlikely that it is a site of high conservation value to invertebrates. However, the score does indicate a good diversity overall.

The background data search returned fewer species than were recorded during the field surveys (536 species) and fewer notable species (75). This has been attributed to the detailed level of field survey effort and is highlighted by the low number (10) of notable species that occur in both the data search and survey data. This also suggests that there is very limited value in comparing the data from background information with survey data in great detail.

Four species were found during field surveys that are listed on Section 42 of the NERC Act. Records of these species were also returned in the background data search. The four species are: grayling butterfly *Hipparchia semele*, small heath butterfly *Coenonympha pamphilus*, wall butterfly *Lasiommata megera* and cinnabar moth *Tyria jacobaeae*. The habitats most valuable to these species are flowering shrubs and species-rich grassland. Improved areas of grassland containing ragwort *Senecio jacobaea* are also important for the cinnabar moth. In addition to these habitats the results strongly suggest that wetter habitats support the greatest diversity and the highest number of invertebrate species.

The data suggests that it is not appropriate for any species-specific assessment to be carried out to determine the potential effects of the Project. It is recommended that a habitat scale approach is adopted for the impact assessment that would calculate potential impacts on habitats and the likely associated invertebrate assemblages that they might support. This approach will facilitate the development of simple metrics that can be used to quantify impacts more effectively than focussing down to specific family, genus or species level. It is considered likely that using metrics for mitigation design would prove beneficial in determining the residual impacts to invertebrates of any habitat creation or restoration proposals. This would be achieved by using the habitat loss/gain calculations developed for proposed biodiversity offsetting. These metrics establish the quantities and values of habitats lost and compare them to what would be reinstated. This data can then be used to influence the design process and target beneficial residual impacts on invertebrate habitats as a whole.

## 1. Introduction

This report provides a technical summary of the data collected on terrestrial invertebrates within the Wylfa Newydd Development Area and from sites within a 500m buffer zone around the boundary of the Wylfa Newydd Development Area.

### 1.1 Overview

Horizon Nuclear Power Ltd. (Horizon) is currently planning to develop a new nuclear power station on Anglesey as identified in the National Policy Statement for Nuclear Power Generation (EN-6). The Wylfa Newydd Project (the Project) will require a number of applications to be made under various pieces of legislation to a variety of regulators. As a nationally significant infrastructure project under the Planning Act 2008, the construction and operation must be authorised by a Development Consent Order.

Jacobs UK Ltd (Jacobs) was commissioned by Horizon to undertake ecological surveys to inform the various applications, assessments and permits that will be submitted for approval to construct and operate the Power Station and associated developments.

### 1.2 Wylfa Newydd Project

The Project includes the Wylfa Newydd Generating Station and Associated Development<sup>1</sup>. The Wylfa Newydd Generating Station includes two UK Advanced Boiling Water Reactors to be supplied by Hitachi-GE Nuclear Energy Ltd, associated plant and ancillary structures and features. In addition to the reactors, development on the Power Station Site (the indicative area of land and sea within which the majority of the permanent Wylfa Newydd Generating Station buildings, plant and structures would be situated) will include steam turbines, control and service buildings, operational plant, radioactive waste storage buildings, ancillary structures, offices and coastal developments. The coastal developments will include a Cooling Water System (CWS) and breakwater, and a Marine Off-Loading Facility (MOLF).

### 1.3 Site Description

The Wylfa Newydd Development Area (the indicative areas of land and sea, including the Power Station Site, the Wylfa NPS<sup>2</sup> Site and the surrounding areas that would be used for the construction and operation of the Wylfa Newydd Generating Station) covers an area of approximately 380ha. It is bounded to the north by the coast and the existing Magnox power station (the Existing Power Station). To the east, it is separated from Cemaes by a narrow corridor of agricultural land. The A5025 and residential properties define part of the south-east boundary, with a small parcel of land spanning the road to the north-east of Tregele. To the south and west, the Wylfa Newydd Development Area abuts agricultural land, and to the west it adjoins the coastal hinterland.

The Wylfa Newydd Development Area includes the headland south of Wylfa Head candidate Wildlife Site. There is one designated site for nature conservation within the Wylfa Newydd Development Area; Tre'r Gof Site of Special Scientific Interest (SSSI). It is also within 1km of the Cae Gwyn SSSI, Cemlyn Bay Special Area of Conservation (SAC) and SSSI, and the Ynys Feurig, the Skerries and Cemlyn Bay Special Protection Area (SPA).

Tre'r Gof is a small basin mire adjacent to the Existing Power Station, west of Cemaes. The area receives mineral-enriched waters from the surrounding boulder clay leading to the development of notable flora. It is the botanical interest that provides the reason for the designation of the site as a SSSI.

<sup>1</sup> Development needed to support delivery of the Wylfa Newydd Generating Station is referred to as Associated Development. This includes highway improvements along the A5025, park and ride facilities for construction workers, Logistics Centre, Temporary Workers' Accommodation, specialist training facilities, Horizon's Visitor Centre and media briefing facilities.

<sup>2</sup> The site identified on Anglesey by the National Policy Statement for Energy EN-6/NPS EN-6 as potentially suitable for the deployment of a new nuclear power station.

Cae Gwyn SSSI is located immediately to the south of the site to the west of Llanfachell. The site comprises two wetland areas separated by an outcrop of rock with heathland vegetation. The southern wetland is confined by a rock basin and is dominated by bogmoss (*Sphagnum* spp.) and a wide variety of common wetland herbs. The northern wetland has a different flora containing denser areas of willow (*Salix* spp.) and common reed (*Phragmites communis*).

## 1.4 Report Aims and Objectives

This report is intended to provide a technical summary of the data collected on terrestrial invertebrates within the Wylfa Newydd Development Area and from sites within a 500m buffer zone. The Wylfa Newydd Development Area and 500m buffer zone combined are referred to as the “study area” in this report, and are shown in figure 0.1.

The report collates all data from previous surveys and background data available and uses them to assess the comparative importance of different habitats present to invertebrates. This is achieved by looking at the relative species diversity of the site and considering the ecology and conservation status of individual notable species, where appropriate.

## 1.5 Previous Work

Surveys of the study area have taken place in consecutive years between 2011 and 2014 by Rachel Hacking Ecology Ltd. under the contract from Ove Arup and Partners in 2011 and 2012 and under Jacobs in 2013 and 2014.

A background data search exercise was completed by Jacobs in 2013 in order to inform the scope of surveys required as part of a future Environmental Impact Assessment (EIA) and Habitats Regulations Assessments (HRA). This included a request to Cofnod (North Wales Environmental Information Service) who provided a spreadsheet containing all plant and animal species records from within 2.5km of the study area. Jacobs has also been maintaining records of incidental invertebrate observations during other field surveys. Both datasets were used in this report to increase understanding of the study area.

## 1.6 Legal Status

Numerous species of terrestrial invertebrate receive protection under wildlife legislation in the UK. There are also species that are of increased nature conservation status due to their relative rarity or importance at a local, regional, national or international scale. The legislation and nature conservation designations relevant to the species recorded during the surveys are given in the following sections.

### 1.6.1 Natural Environment and Rural Communities (NERC) Act 2006

The NERC Act 2006 places a statutory duty on public bodies to have regard to the conservation of biodiversity whilst exercising its functions. In Wales, this is sanctioned by Section 42 which lists habitats and species of ‘principal importance’ whose conservation the Welsh Assembly must take reasonable steps to further or promote. These species and habitats are material considerations in the planning process. There are currently 187 invertebrate species listed under Section 42 (including aquatic species).

### 1.6.2 UK Post 2010 Biodiversity Framework

The UK Biodiversity Action Plan (UK BAP), published in 1994, was the UK’s response to the commitments of the Rio Convention on Biological Diversity (1992). This has since been replaced by the UK Post-2010 Biodiversity Framework. This framework covers the period 2011 – 2020 and forms the UK government’s response to the new strategic plan of the United Nations Convention on Biodiversity (CBD) published in 2010. The UK BAP partnership therefore no longer operates, with a framework replacing it which promotes a focus on individual countries delivering targets for protection of biodiversity through their own strategies.

In Wales the strategy that has been adopted transferred of the species and habitats listed under the defunct UK BAP to Section 42 of the NERC Act (described above). However, many of the tools and resources originally

developed under the UK BAP still remain of use, including background information on UK BAP priority habitats and species which form the basis of county level biodiversity protection initiatives e.g. Local Biodiversity Action Plans (LBAP).

### **1.6.3 Conservation Classification of Nationally Rare/Scarce/Notable species**

The following terms are used for species with elevated conservation designations (summarised from definitions in Jacobs 2014b):

- *Nationally Rare* species are those that have been recorded in less than 15 10km squares in the UK; and
- *Nationally Scarce* species are those that have been recorded in 16-100 10km squares.

*Nationally Scarce* species can be further divided into the following groups:

- *Nationally Scarce: Notable A species* – recorded in 16-30 10km squares; and
- *Nationally Scarce: Notable B species* – recorded in 31-100 10km squares.

The term “Nationally Notable” is also used in this report where a species conservation status is either ‘Nationally Scarce: Notable A’ or ‘Nationally Scarce: Notable B’, but has not been divided up further in previous reports.

### **1.6.4 Local Species**

A species described as being “Local” in this report does not receive any particular protection or conservation status but has a restricted range, being generally found in 101–300 10km squares.

### **1.6.5 Red Data Book Species**

In addition to the classifications above, the background data search refers to those species that are listed in Red Data Books. The Red Data Book system was initiated by the International Union for Conservation of Nature (IUCN) in 1996. The books deal with many plants, fungi and animals at a global, country and regional scale. The aim has been to identify those species at greatest risk of extinction and to identify the factors responsible in order to inform conservation approaches. Species are classified according to their breeding status within each site and by their conservation status.

## 2. Field Study Methodology

### 2.1 10

#### 2.2 Survey Locations

The extent of the study area has evolved since the start of terrestrial invertebrate surveys in 2011. At the start of the survey programme the surveys generally only included the Wylfa Newydd Development Area, whereas the 2014 surveys included sample sites within the 500m buffer zone. The extension to the study area was provided to contextualise the results gathered within the Wylfa Newydd Development Area.

The study area is 380ha in extent and so due to its size it has not been practical to survey the entire area exhaustively. The approach used was to take samples of invertebrates using the methods given below in specific locations only. These locations were chosen based on their ecological characteristics e.g. botanical composition and/or abiotic features. Particular attention was paid to areas with a potential increased likelihood of supporting diverse terrestrial invertebrate assemblages and included the two SSSIs, wetland, heathland, and semi-improved grassland areas. The majority of the remaining study area comprised improved grassland of limited value for invertebrates and so fewer survey sites were sampled.

The locations of the 17 individual survey sites (2001 – 2014) are given in Figure 0.1. These locations have been identified differently within each annual baseline report (Arup 2011 and 2012, Jacobs 2013 and 2014), therefore in order to enable clear interpretation of the results, the sites have been re-numbered so they can be shown on a single figure and can be clearly described.

Descriptions of the survey sites are taken from the most recent survey of that site with references provided where necessary.

#### 2.3 Desktop Study

A spreadsheet of notable invertebrate records obtained from Cofnod was analysed to compare the results of the field surveys to historical invertebrate data from within a 2.5km search radius of the boundary of the study area. A review of the incidental records spreadsheet maintained by ecologists from Jacobs since 2013 was also carried out.

#### 2.4 Sampling Methods

There have been a variety of different methods used to sample populations of terrestrial invertebrates within the study area between 2011 and 2014, these are summarised in Table 1.

**Table 1: Summary of Survey Methodologies**

Survey Methodology	2011	2012	2013	2014
Hand-searching	Y	Y	Y	Y
Pitfall trapping	Y	Y	Y	N
Pootering	Y	Y	N	Y
Suction sampling	N	Y	N	Y
Sweep-netting	Y	Y	Y	Y

Survey Methodology	2011	2012	2013	2014
Yellow-bowl trapping	Y	Y	N	N

## 2.5 Survey Seasons

Each site was visited several times within each survey year in order to provide a range of samples. This enabled surveyors to target a wider range of invertebrates owing to the different flying seasons and lifecycles of different species. Generally survey sites were visited a minimum of twice between June and September, which is the peak period during the invertebrate active season.

## 2.6 Quality Control

The independent verification of species identification was conducted for several groups of invertebrates due to the difficulty in identifying them to species level. These are referenced in the annual baseline reports produced for each season of survey and are not repeated here.

## 2.7 Limitations

Where limitations were present they are discussed within each individual annual baseline report (see Arup 2011 and 2012, Jacobs 2013 and 2014).

During each year of field survey the sampling method used and survey sites selected were not standardised. This was caused by a number of factors including:

- limited access being available;
- changes in scope;
- poor weather; and
- presence of livestock.

This means that the survey data cannot be directly compared between years, although this is not considered to be a significant constraint as the surveys were designed to record the presence of notable assemblages or species within the study area and not to monitor their relative abundance or distribution over time.

The study area is extremely large and so it is not practical, or necessary, to exhaustively search every habitat and record every species present. As with all surveys, there is the potential for individual species or small assemblages of invertebrates to be overlooked, especially as each survey can only provide a 'snap-shot in time'. However, the amount of data collated following four years of surveys is considerable and as the surveys have been designed to focus on the habitats with the greatest potential for supporting diverse invertebrate assemblages, the likelihood of finding additional protected/notable terrestrial invertebrate species in the study area that have not been previously recorded is considered to be low. As such, this baseline is considered to be robust.

The surveys did not include several methods of surveying for invertebrates that could have been used. This includes transects for butterflies and moth trapping. These species belong to a group (Lepidoptera) that is popular with the public because they are colourful and easy to identify. This often makes them a group that is well represented in background data searches. The results from the background data search in this report support this theory with many more species records of Lepidoptera provided in the data from Cofnod than were recorded during the field surveys. This is not considered to significantly affect the interpretation of the results.

## 3. Results

### 3.1 Desktop Study

The background data search from Cofnod returned 536 species of terrestrial invertebrate within 2.5km of the Wylfa Newydd Development Area. Of these species, 75 are listed in the Red Data Book, Section 42 of the NERC Act, and/or a local BAP. The data search does not provide the conservation status of species with respect to notability (i.e. Notable A/Notable B/Nationally Scarce/Local). A full list is provided in Appendix B.

The incidental records spreadsheet returned 38 species of which one is a notable butterfly and had not been previously recorded within the study area (grayling). The remaining 37 species do not have any elevated conservation status, and include ten species that have not previously been recorded during dedicated surveys.

Table 2 provides a summary of the numbers of notable species from Cofnod data and data from the incidental records database.

**Table 2: Summary of number of notable species recorded by Cofnod within 2.5km of Wylfa Newydd Development Area boundary**

Order <sup>3</sup>	Red Data Book 1 and LBAP	Red Data Book 1	Red Data Book 2	S42 (UKBAP)	S42 (UKBAP) and LBAP	LBAP	Total
Coleoptera (Beetles)	-	2	1	-	-	-	3
Hymenoptera (Bumblebees)	-	-	-	-	-	5 (3)	5
Lepidoptera (Butterflies)	-	-		1 (1)	4 (2)	1	6
Lepidoptera (Moths)	-	4	1	6	38 (1)	5	54
Odonata (Damselflies)	1	-	-	-	-	4	5
Odonata (Dragonflies)	-	-	-	-	-	3 (3)	3
Totals recorded in study area <sup>4</sup>	1 (0)	6 (0)	2 (0)	7 (1)	42 (3)	18 (6)	76 (10)

<sup>3</sup> Broad divisions are also shown. With respect to hymenoptera, bumblebees are the only family represented in the data search.

<sup>4</sup> Species recorded in the study area in any of the years of survey are shown in brackets.

### 3.1.1 Red Data Book Species

There are nine species within the background data search that are listed in Red Data Books. None of these species have been recorded within the study area.

### 3.1.2 Section 42 NERC Act Species

Forty-nine species were returned in the background data search that are listed on Section 42 of the NERC Act. Of these species, four have been previously recorded in the study area. These are:

- Butterfly – grayling *Hipparchia semele*;
- Butterfly – small heath *Coenonympha pamphilus*;
- Butterfly – wall *Lasiommata mergera*; and
- Moth – cinnabar moth *Tyria jacobaeae*.

### 3.1.3 Local Biodiversity Action Plan Species

The background data shows that there are 60 species that have LBAP status in north Wales. However, none of these species are included on the Anglesey LBAP (UK BARS, 2015). The species that have been recorded in the study area are:

- Bumblebee – Flintshire LBAP buff-tailed bumblebee *Bombus terrestris*;
- Bumblebee – Flintshire LBAP common carder bee *Bombus pascuorum*;
- Bumblebee – Flintshire LBAP red-tailed bumblebee *Bombus lapidarius*;
- Damselfly – Snowdonia LBAP blue-tailed damselfly *Ischnura elegans*;
- Damselfly – Snowdonia LBAP large red damselfly *Pyrrhosoma nymphula*; and
- Dragonfly – Snowdonia LBAP common darter *Sympetrum striolatum*.

These species are all relatively common and widespread, but can have low local abundances, or have suffered local declines. None of these six species are of conservation concern in Anglesey, but are still classed as notable due to the proximity of the study area to Flintshire and Snowdonia.

### 3.1.4 Study Area Descriptions and Total Numbers of Species Recorded

A total of 17 sites have been sampled within the study area between 2011 and 2014. These are shown in Figure 0.1 and brief descriptions of each site are provided in Table 3 (taken from the most recent survey visits to those sites). Table 3 also shows the total number of species recorded each year at each site. The total number of notable species recorded shown is collated from all years of survey. This value is derived from comparing data between all the years to prevent species that are recorded in multiple years being double-counted. The raw data containing the notable species records is provided in Appendix C.

In summary:

- In 2011 there were 403 species recorded from 14 survey sites;
- In 2012 there were 484 species recorded from 12 survey sites;
- In 2013 there were 582 species recorded from 14 survey sites; and

- In 2014 there were 198 species recorded from four survey sites.

Table 3: Site Habitat Descriptions

Survey Site	Site Description and Year of Most Recent Survey	Total species recorded 2014				Total notable species recorded
		2011	2012	2013	2014	
1	<p>Site 1 is located to the north of the existing Magnox Power Station and south of Wylfa Head. It is an area of species-rich grassland and scattered scrub. Site 1 is a good site for invertebrates as there are a large number of flowering plant species present and the structural diversity of the habitat is excellent. Plant species include black knapweed <i>Centaurea nigra</i>, pale flax <i>Linum bienne</i>, red bartsia <i>Odontites vernus</i>, Smith's pepperwort <i>Lepidium heterophyllum</i> and yarrow <i>Achillea millefolium</i>.</p> <p>Last surveyed 2013.</p>	123	142	127	-	15
2	<p>Site 2 comprises Wylfa Head. The habitats are predominantly unimproved coastal grassland with scrub, heath and marshy grassland. An ephemeral pool exists within the centre of the site. The headland is exposed and the vegetation is low-growing. Species typical of coastal grassland occur here and include buck's-horn plantain <i>Plantago coronopus</i>, devil's-bit scabious <i>Succisa pratensis</i>, sea-milkwort <i>Glaux maritima</i>, and yellow bartsia <i>Parentucellia viscosa</i>. During 2012, a small patch of petty whin <i>Genista anglica</i> was located on the western side of the headland. This was re-found during 2013 and was in flower.</p> <p>Last surveyed 2013.</p>	38	119	29	-	13
3	<p>Site 3 is the grassland slope north of Tre'r Gof SSSI. Plant species at this site include common hogweed <i>Heracleum sphondylium</i>, meadow buttercup <i>Ranunculus acris</i>, yarrow and yellow rattle <i>Rhinanthus minor</i>.</p> <p>Last surveyed 2012.</p>	30	26	-	-	1

4	<p>Site 4 comprises Tre'r Gof SSSI and is an extensive area of fen, ditches, open water, marshy grassland and woodland. A large part of Tre'r Gof is dominated by common reed <i>Phragmites australis</i>. Within the centre of the site is a dense patch of willow <i>Salix</i> carr. The marsh vegetation is species-rich and includes bog pimpernel <i>Anagallis tenella</i>, great fen sedge <i>Cladium mariscus</i>, marsh bedstraw <i>Galium palustre</i>, marsh lousewort <i>Pedicularis palustris</i>, water mint <i>Mentha aquatica</i> and yellow flag iris <i>Iris pseudacorus</i>. A stream runs through the middle of the SSSI and a few ditches are present. The stream is base-rich and flows into an acidic habitat, making this site valuable and rare in the UK.</p> <p>Last surveyed 2013.</p>	152	162	51	-	15
5	<p>Site 5 comprises a woodland glade and forms part of the Nature Walk within the plantation woodland to the east of Magnox Power Station. The path goes through the woodland and dense scrub habitats. Flowering plants are plentiful and the path provides edge habitat which is sheltered and full of nectar and pollen sources. The plant species include colt's-foot <i>Tussilago farfara</i>, foxglove <i>Digitalis purpurea</i>, gorse <i>Ulex europaeus</i>, and red campion <i>Silene dioica</i>.</p> <p>Last surveyed 2013.</p>	72	120	148	-	17
6	<p>Site 6 comprises a pond, stream and associated marshy grassland south of the visitor centre behind the Lodge. The stream and the small pond to the south hold water in the early part of the year only. The pond is covered in common duckweed <i>Lemna minor</i>. The marginal marshy vegetation comprises greater bird's-foot trefoil <i>Lotus pedunculatus</i>, soft rush <i>Juncus effusus</i>, and water mint. Water-cress <i>Nasturtium officinale</i> grows in the stream as well as greater willowherb <i>Epilobium hirsutum</i>.</p> <p>Last surveyed 2013.</p>	34	33	102	-	3
7	<p>Site 7 is an area of marshy grassland associated with a pond and a well with some low-lying boggy areas, situated within the landholding of Caerdegog Isaf. The grassland supports an abundance of species such as cuckooflower <i>Cardamine pratensis</i>, marsh cinquefoil <i>Potentilla palustris</i>, meadowsweet <i>Filipendula ulmaria</i>, soft rush and spotted orchid <i>Dactylorhiza</i> sp. In wetter areas, there were stands of yellow flag iris.</p> <p>Last surveyed 2013.</p>	57	46	96	-	8

8	<p>Site 8 is an extension of Site 7 and is similar in character.</p> <p>Last surveyed 2013.</p>	-	-	67	-	9
9	<p>Site 9 is the Cae Gwyn SSSI and has only been accessed and surveyed in 2013. The SSSI mainly comprises two areas of fen (the northern basin and the southern basin) and a large outcrop of rock with dry heath. Dense scrub and bracken occurs in other parts. The northern basin comprises species such as broad-leaved pondweed <i>Potamogeton natans</i>, common cottongrass <i>Eriophorum angustifolium</i>, common spike-rush <i>Eleocharis palustris</i>, creeping willow <i>Salix repens</i>, cross-leaved heath <i>Erica tetralix</i>, marsh St. John's-wort <i>Hypericum elodes</i>, meadowsweet, and water mint. The southern basin comprises all of the above species plus others including cranberry <i>Vaccinium oxycoccus</i> and marsh fern <i>Thelypteris palustris</i>. The heathland (gorse and heather) occurs predominantly over the rock outcrop, although towards the base of the outcrop, the heath is wet and dominated by cross-leaved heath. The site is species-diverse and structurally diverse and offers an excellent habitat for invertebrates.</p> <p>Last surveyed 2013.</p>	-	-	157	-	14
10	<p>Site 10 is a stream corridor which runs along the western boundary of the entire study area. The stream corridor is well-vegetated with species such as fool's-watercress <i>Apium nodiflorum</i>, greater willowherb and peppermint <i>Mentha spicata</i> along its length.</p> <p>Last surveyed 2013.</p>	59	113	113	-	18
11	<p>Site 11 is the fen and associated marshy grassland to the west of Pont Cafnan. The fen is fed by a stream which was wet during the 2013 survey season. The fen is similar to parts of Tre'r Gof SSSI, with stands of common reed and a similar flora in the low-lying marshy areas. Here, gipsywort <i>Lycopus europaeus</i>, marsh bedstraw and marsh cinquefoil all provide abundant pollen and nectar sources for invertebrates.</p> <p>Last surveyed 2013.</p>	16	144	128	-	22

12	<p>Site 12 comprises a large expanse of relatively species-rich grassland, bordered to the south by a stream. To the west the habitat becomes more similar to coastal grassland. The grassland species-mix is similar to Site 1, with many flowering plants. Towards the coast, plants occur including kidney vetch <i>Anthyllis vulneraria</i>, sheep's-bit <i>Jasione montana</i>, and thrift <i>Armeria maritima</i>. The stream corridor supported lesser water-parsnip <i>Berula erecta</i>.</p> <p>Last surveyed 2013.</p>	166	80	88	-	12
13	<p>Site 13 comprises part of the National Trust-owned coastline, also known as Trwyn Pencarreg. The coastline here is dominated by heather <i>Calluna vulgaris</i> with bell heather <i>Erica cinerea</i>, cross-leaved heath and purple moor-grass <i>Molinia caerulea</i>. A number of flushes occur which were dry during the 2013 summer visits. The flushes support plants indicative of wet habitats such as bog pimpernel, marsh pennywort <i>Hydrocotyle vulgaris</i> and water mint.</p> <p>Last surveyed 2013.</p>	27	133	77	-	17
14	<p>Site 14 comprises a large stretch of coastal heathland, with wet flushes. The site is open to walkers and is periodically cattle-grazed. Management in the form of bracken rolling and heather cutting was noted on past visits. The heathland comprises a mixture of dry dwarf shrub heath and wet dwarf shrub heath. Heather and purple moor-grass dominates the heathland. Other plants present include tormentil <i>Potentilla erecta</i>, heath milkwort <i>Polygala serpyllifolia</i> and heath spotted-orchid <i>Dactylorhiza maculata</i>. The wet flushes are species-rich and included marsh pennywort, lesser spearwort <i>Ranunculus flammula</i>, marsh lousewort and bog pimpernel.</p> <p>Last survey in 2014.</p>	-	-	-	56	7
15	<p>Site 15 comprises well vegetated shingle with bare shingle still evident in places. The shingle spit is used by walkers. The botanical species present reflect the maritime influence of the habitat. Grasses such as cock's-foot <i>Dactylis glomerata</i>, false oat-grass <i>Arrhenatherum elatius</i>, and red fescue <i>Festuca rubra</i> are interspersed with sea campion <i>Silene uniflora</i>, sea-kale <i>Crambe maritima</i>, sea-milkwort and thrift. Large patches of wild carrot <i>Daucus carota</i> ssp. <i>carota</i> also occur within the habitat, attracting a large number of flying insects</p> <p>Last survey in 2014.</p>	-	-	-	72	2

16	<p>Site 16 is a depression where two fields meet. The ground is boggy and comprises fen and marshy grassland habitats. The field to the east supports a pond. The grassland and fen habitat include species such as greater bird's-foot trefoil, lesser spearwort, marsh cinquefoil, marsh bedstraw, meadowsweet and ragged-robin <i>Lychnis flos-cuculi</i>. The pond supports soft rush and water horsetail <i>Equisetum fluviatile</i>.</p> <p>Last survey in 2014.</p>	-	-	-	68	2
17	<p>Cemaes Bay woodland follows the Afon Wygyr as it approaches the harbour from where it flows beneath the A5025. The plantation woodland is a mixture of native and non-native deciduous and coniferous tree and scrub species, including blackthorn <i>Prunus spinosa</i>, cotoneaster <i>Cotoneaster</i> var., butterfly-bush <i>Buddleja davidii</i>, field maple <i>Acer campestre</i>, Himalayan honeysuckle <i>Leycesteria formosa</i>, purple beech <i>Fagus sylvatica</i> f. <i>purpurea</i>, purple hazel <i>Corylus maxima purpurea</i>, sycamore <i>Acer pseudoplatanus</i> and wych elm <i>Ulmus glabra</i>. Large open areas are also present which support grassland. These areas appear to have been periodically mown. The grassland areas comprise species such as creeping buttercup <i>Ranunculus repens</i>, cut-leaved crane's-bill <i>Geranium dissectum</i>, hemlock water-dropwort <i>Oenanthe crocata</i>, ox-eye daisy <i>Leucanthemum vulgare</i>, and Yorkshire fog <i>Holcus lanatus</i>.</p> <p>Last survey in 2014.</p>	-	-	-	78	2

## 4. Discussion

This section brings together the results from both the analysis of the background data search and the four years of field survey data.

The background data search shows that 77% of the notable species recorded were butterflies or moths. This is likely to be due to the popularity of the group and ease with which they can be surveyed and identified without any specialist equipment. As a result more people are likely to attempt to record these species in their area. This is also why other species that are more diverse are likely to be under represented in the data search results with beetles (Coleoptera) being the most obvious example as they are one of the most diverse groups in the world and are represented by over 4000 species in the UK (Duff, 2012) and account for around 14% of the total number of animals species found in this country (Natural England, 2014). In the background data search there are 93 records of beetles compared to 4013 records of butterflies and moths. There is therefore clearly a disparity between the likely number of species present, and the number actually recorded within many species groups.

However, in the context of the field survey results it is considered that the reverse is true and Coleoptera are perhaps over represented. This is most striking when looking at the notable species actually recorded during the surveys of which 79% were Coleoptera. This is due to the sampling methods used and that moth trapping and butterfly transects were not included within the scope of surveys completed within the study area. There is therefore the potential for the study area to support more notable butterflies and moths than the empirical data would suggest. This should be included within caveats to inform mitigation and for the long-term management of the study area.

### 4.1 Notable Species

The notable species that were recorded in both the background data search and the survey data are described in greater detail below.

#### 4.1.1 Grayling – *Hipparchia semele*

The grayling is the largest of the “browns” and although conspicuous in flight, it is very cryptic when at rest and difficult to see. The species is found on sheltered, sunny and dry sites where vegetation is sparse. This includes heathland, sand dunes, coastal grassland and quarries. The food plants of the larvae include fescue grasses, bristle bent *Agrostis curtisii* and tufted hair-grass *Deschampsia cespitosa*. The adults feed on brambles, thistles, clovers and teasels (UK Butterflies, 2015a).

The species was recorded in the summer of 2013 during NVC surveys of heathland habitats in the study area. The species was seen five times in 2013 and up to five individuals were recorded at any one time. Populations of the species are therefore likely to be well established in the study area. The distribution of the species suggests that it is not unusual for the species to be found in any coastal areas, especially on the western side of the country (UK Butterflies, 2015a). The distribution map also shows that the species is rarely found in the centre of the country and is virtually absent from landlocked counties. The distribution of the species across Anglesey is unknown.

The coastal grassland habitat and heathland mosaics around Wylfa Head and Trwyn Pencarreg are areas that are likely to support grayling, and this is where the species was recorded by surveyors. The heathland habitats within Cae Gwyn SSSI also support the species and it was also recorded here.

#### 4.1.2 Small heath - *Coenonympha pamphilus*

The small heath is a species of butterfly from the Satyrinae family and is the smallest of the “browns” (UK Butterflies, 2015b). The species is often associated with heaths but is not confined to them as it is often found in grassland habitats. In the study area the species was recorded in Site 9 (Figure 0.1); the grassland north-east of the Cae Gwyn SSSI (Site 10). This area is adjacent to heathland habitat within the SSSI and so its presence is not unexpected. Larvae feed on a variety of grass species e.g. bents *Agrostis spp.* and fescue

grasses while adults feed on bramble, buttercups *Ranunculus* spp. devil's-bit scabious, fleabane *Pulicaria dysenterica*, greater stitchwort *Stellaria holostea*, kidney vetch *Anthyllis vulneraria*, ragwort, tormentil and yarrow.

Small heath is a species that has a distribution covering almost all of the UK, although it does become rarer in the far north of Scotland (UK Butterflies, 2015b). The presence of the species within the study area is therefore not unexpected geographically. However, the species has only been recorded from one survey site and so may be uncommon in the local area. The distribution of the species across Anglesey is unknown.

The habitats that are likely to support the species are widespread and common within the study area and so it is surprising that the species was only recorded from one area.

#### **4.1.3 Wall brown – *Lasiommata megera***

The wall butterfly gets its name from its characteristic behaviour of resting with wings two-thirds open on bare surfaces such as walls, bare ground and pathways (UK Butterflies, 2015b). The larval food plants of the species are similar to those of the small heath (above). Adult nectar sources are also similar to the small heath with the addition of hawkweeds *Hieracium/Hypochoeris* spp., knapweeds *Centaurea* spp. and thistles.

The species has suffered severe decline and is now confined to coastal regions in many areas (UK Butterflies, 2015b) and has disappeared from many sites in central, eastern and south-east England. The distribution of the species across Anglesey is unknown. The distribution map also shows that wall brown is likely to be at its northern-most range as it is absent from all but the south-western regions of Scotland. The north Anglesey coast is therefore within the normal range of the species. This butterfly has only been recorded once in the study area which suggests that it is not particularly abundant in the area, and typical of its habit of living in small self-contained colonies. However, the species is known to rapidly colonise new areas, if there is suitable habitat present.

The species was recorded in five locations in the study area (Sites 6, 9, 10, 12 and 14), which support wetter habitats, grassland, and heath. Interestingly, Areas 6, 9 and 10 are not adjacent to the coast and so indicate that the species has a distribution that is not limited to coastal areas in the north of Anglesey.

#### **4.1.4 Cinnabar moth – *Tyria jacobaeae***

The cinnabar moth is a medium-sized red and black species found most often on common ragwort, other ragwort species and groundsel *Senecio vulgaris* (Butterfly Conservation, 2015). The species is frequent in open grassy habitats including waste ground, railway banks, gardens and woodland rides. However, the species is often most abundant on well drained rabbit-grazed grassland, mature sand-dunes and heathland.

The species abundance is reported to have fallen by more than 80% in the past 35 years, a reduction that has been attributed to the removal of ragwort from fields used for livestock grazing (The Wildlife Trusts, 2015). The species has been most regularly recorded in fields where grazing animals are present, and is generally less well represented in fields where grassland habitats have been allowed to grow long. This is typical of the pattern seen across the UK caused by ragwort being swamped by more dominant grass (Buglife, 2015). The distribution of the species on Anglesey in general is not known, but is likely to be heavily influenced by the abundance of ragwort.

The species was recorded at three locations in the study area: Sites 1, 5 and 12. Sites 1 and 12 are both representative of typical habitat of the species as they mostly comprise rabbit and sheep grazed coastal grassland abundant with larval and adult food plants. The record from Site 5 is surprising as the habitat here is primarily woodland.

#### **4.1.5 Non-Anglesey LBAP Species**

Three bumblebee species were recorded in the study area during surveys, which are LBAP species (buff-tailed bumblebee, common carder bee, and red-tailed bumblebee). These species are all common and widespread but have suffered declines due to agricultural intensification and urbanisation. All three species are considered

to be generalists in their habits, and will occupy grassland, woodland and hedgerows for nesting and finding sources of nectar for food.

The three Odonata species (blue-tailed damselfly, large red damselfly and common darter) are also common and widespread but have also local significance in the nearby districts of Flintshire and Snowdonia, leading to them having LBAPs. These species are all aquatic and are not discussed in the context of the effect on terrestrial habitats (see Jacobs 2015 for more information).

These six species are not considered separately within the interpretation of the results as they are not of relevance to the study area, and are also not listed within any of the other “notable” classifications.

#### **4.2 Assessing the value of the survey areas for invertebrates**

An assessment of the value of habitat types present within the study area has been undertaken to establish their relative importance for invertebrates.

One method that has been applied to classifying relative importance of habitats was proposed by Ball (1986) using Species Quality Index (SQI). This method assigns scores to all species according to their nature conservation status as shown in Table 4.

**Table 4: Species Quality Index scoring system (taken from Ball, 1986)**

Conservation Status	Score
Red data book species	100 points
Notable A species	50 points
Notable B species	40 points
Notable (scarce) species	40 points
Local species <sup>5</sup>	20 points
Common species	No score
Status not formally known	No score

The score for each site is calculated as the total score of all notable species recorded at that location divided by the maximum number of species recorded, as shown in Table 5.

**Table 5: Study area Species Quality Analysis site scores**

Site No.	Total SQA score	Maximum number of species recorded <sup>6</sup>	SQI
1	300	142	2.1

<sup>5</sup> This includes Section 42 NERC Act listed species in this assessment.

<sup>6</sup> The maximum number of species recorded is used instead of total number of species recorded across all years due to the data not being collated in such a way to compare which species were recorded in multiple years across all species. There is therefore a potential source of error in the final SQI scores. However, these adjusted scores are likely to bias sites towards being of higher importance and so are considered suitable.

Site No.	Total SQA score	Maximum number of species recorded <sup>6</sup>	SQI
2	300	127	2.4
3	20	30	0.7
4	360	181	2.0
5	320	148	2.2
6	60	102	0.6
7	180	96	1.9
8	200	67	3.0
9	280	170	1.6
10	390	113	3.5
11	460	144	3.2
12	240	166	1.4
13	410	144	2.8
14	140	58	2.4
15	40	72	0.6
16	40	68	0.6
17	40	78	0.5
Average site Score	222.4	112	1.85

Table 5 shows that the sites that support the highest average Species Quality Analysis score are Sites 8, 10 and 11. These are all considered to be wet habitats (see Table 3). This form of analysis further suggests that sites that support wet habitats are the most valuable within the study area. The SQI scores also show that Sites 3, 6 and 15-17 are the least valuable as they generally support fewer species, and have proportionally lower SQI scores. This is mirrored by the results in Table 5 which place all four sites in the bottom half when ranked according to the combined total diversity and notable species that each area supports.

The SQI scores for the combined survey areas range between 0.5 (Site 15) and 3.5 (Site 10). These scores must be compared to data collected for other sites in order to provide meaningful conclusions. It has not been

possible to find examples of this approach being used in north Wales but in Essex sites with “good” invertebrate diversity would have values above 5.0, “excellent” sites might have a value above 7.5 and sites with scores approaching 10.0 are likely to be of “national significance”. While it is likely that the thresholds for these classifications will be lower due to diversity being affected by latitude (i.e. climate and shorter seasons) and island biogeography (i.e. isolation effects of not being connected to the mainland), it is considered that the index would suggest that the areas sampled within the study area are not of particularly high invertebrate diversity.

This is a very simplistic test and would ideally be compared with the data from the background search having been scrutinised in the same way. However, within the background data the conservation status of all 536 species has not been provided and the survey efforts are in no way comparable. It is therefore considered that there would be no value in producing an SQL value for the 2.5km background search area.

### **4.3 Habitats**

The information from the desk study field survey is considered suitable and sufficient to inform any impact assessment produced for the development area and so no further surveys are proposed. This is based on the number of notable species being recorded being sufficient to inform which habitats are of lesser or greater value in relative terms within the development area.

### **4.4 Site Comparisons**

Appendix C provides the list of notable species that have been recorded in the study area and what their habitat requirements are (if known). Appendix C is summarised below in Table 6. Table 6 ranks the sites according to the maximum number of species that were found at each site in any one year (Row 2), and provides a second rank showing the sites in order of the total number of notable species found in each site across all years (Row 3). The third rank combines the two values by assigning them values between one and 17 according to increasing position within each rank. This is based on the assumption that all notable species are of equal value. It is accepted that this is not the case within any conservation valuation system but it is considered that for the purposes of aiding the understanding of this site, the calculation is useful.

A worked example is provided below:

- Site 17 is sixth lowest in the ranking of number of species and therefore scores 6 points;
- Site 17 is fourth lowest in the ranking of number of notable species and therefore scores 4 points; therefore
- Site 17 has a combined score of 10 points.

The value of ten is then ranked according to the scores of other survey sites to determine those of comparably higher or lower value to invertebrates.

This analysis shows that in combination, Site 3 is probably the least valuable to invertebrates and Site 11 is probably the most valuable to invertebrates.

**Table 6: Summary of Notable Species Data Recorded in the Study Area**

	Site Rank – Lowest Rank Scores 1, Highest Rank Scores 17																
	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup>	9 <sup>th</sup>	10 <sup>th</sup>	11 <sup>th</sup>	12 <sup>th</sup>	13 <sup>th</sup>	14 <sup>th</sup>	15 <sup>th</sup>	16 <sup>th</sup>	17 <sup>th</sup>
<b>Site number in rank order according to maximum number of species per site in one year (number of species is shown in brackets)</b>	Site 3 (30 sp.)	Site 14 (58 sp.)	Site 8 (67 sp.)	Site 16 (68 sp.)	Site 15 (72 sp.)	Site 17 (78 sp.)	Site 7 (96 sp.)	Site 6 (102 sp.)	Site 10 (113 sp.)	Site 2 (119 sp.)	Site 13 (133 sp.)	Site 1 (142 sp.)	Site 11 (144 sp.)	Site 5 (148 sp.)	Site 9 (157 sp.)	Site 4 (162 sp.)	Site 12 (166 sp.)
<b>Site number in rank order according to maximum number of notable species per site in one year (number of species is shown in brackets)</b>	Site 3 (1 sp.)	Site 15 (2 sp.)	Site 16 (2 sp.)	Site 17 (2 sp.)	Site 6 (3 sp.)	Site 14 (7 sp.)	Site 7 (8 sp.)	Site 8 (9 sp.)	Site 12 (12 sp.)	Site 2 (13 sp.)	Site 9 (14 sp.)	Site 1 (15 sp.)	Site 4 (15 sp.)	Site 5 (17 sp.)	Site 13 (17 sp.)	Site 10 (18 sp.)	Site 11 (22 sp.)
<b>Site number in combined rank score order (combined total rank score shown in brackets<sup>7</sup>)</b>	Site 3 (2)	Site 15 (7)	Site 16 (7)	Site 14 (8)	Site 17 (10)	Site 8 (11)	Site 6 (13)	Site 7 (14)	Site 2 (20)	Site 1 (24)	Site 10 (25)	Site 9 (26)	Site 12 (26)	Site 13 (26)	Site 5 (28)	Site 4 (29)	Site 11 (30)
<b>Predominant habitat<sup>8</sup></b>	Grass	Grass	Wet	Heath	Wood	Wet	Wet	Wet	Grass	Grass	Wet	Heath	Grass	Heath	Wood	Wet	Wet

<sup>7</sup> Where scores are tied the maximum total number of species that the site has been shown to support is used as the tie-breaker.<sup>8</sup> Grassland is not divided into coastal, improved or unimproved habitat types, and wet habitats include bog, fen, marshy grassland and riparian habitats in general.

## 4.5 Habitat and Invertebrate Family Comparisons

Table 7 shows that there are eight broad habitat types used by the notable species found within the study area. The classification *Unknown* is assigned to notable species where it has not been possible to determine the habitats they use. A summary of the species these habitats support is provided in Table 7.

**Table 7: Habitat and invertebrate family comparisons**

Habitat type	Orders	Families	Species
Unknown	2	12	30
Hygrophilous <sup>9</sup>	3	12	25
Grassland – generalist	2	7	13
Grassland – unimproved	5	4	6
Heath	3	5	5
Grassland – improved	1	3	4
Woodland	1	1	2
Aquatic	1	1	1
Scrub	1	1	1

The table shows that there were more hygrophilous notable species recorded during the field surveys than species occupying any other habitat. This is substantiated to some degree by the data in Table 5 which shows that Sites 4 and 11 were the most species diverse and predominantly wet habitat areas. The data in Table 4 and Table 7 also show that improved grassland supports relatively few notable species which is potentially significant given the relative amounts of improved grassland compared to other habitats e.g. heath, which is only represented in very small amounts in the study area.

The species for which habitats could not be assigned are ignored in the analysis of Table 7 and for the purposes of Section 4 are assumed to be represented in similar proportions within each habitat classification as the other species.

<sup>9</sup> Hygrophilous – species preferring wet habitats.

## 5. Conclusions and Recommendations

The study area has been surveyed for terrestrial invertebrates over a period of four years (2011 – 2014) using a wide variety of different survey methods. The field survey data has been supplemented by a background data search covering a 2.5 km radius from the boundary of the development area.

The background data search returned 536 species of terrestrial invertebrate, of which 75 are either Red Data Book listed Species, listed on Section 42 of the NERC Act or are LBAP species. Nine of these species have been recorded within the study area.

The field survey data from 17 different sites within the study area recorded maximums of between 198 and 582 species per year with a total number of species of 717, 87 of which are notable (i.e. Section 42 NERC Act listed or have elevated conservation status). This ratio gives a SQI score of 5.3 which would make it unlikely to be a site of high conservation value to invertebrates, although it does support a good level of diversity.

The highest level of protection status of any species in the study area is afforded to the four species listed on Section 42 of the NERC Act (cinnabar moth, grayling, small heath and cinnabar moth). These four species are generally considered to be fairly common and widespread but have significantly reduced in number in recent years. An important habitat feature required for all these species is food availability in the form of sources of nectar. These would include habitats containing an abundance of flowering shrubs and species rich grassland, including some agriculturally improved areas containing ragwort for the cinnabar moth.

In addition to the important habitats described above, the results strongly suggest that the habitats that support the greatest diversity and the highest number of species are the wetter habitats.

The data suggests that it would not be appropriate for any species specific assessment to be carried out to determine the potential effects of the Project. Rather, it is suggested that a habitat scale approach is adopted that calculates effects on habitats and likely associated invertebrate assemblages that they support.

In terms of application when determining mitigation approaches, the highest value habitats could then be prioritised for avoidance and minimisation of habitat loss ahead of lower value habitats in the first instance. Furthermore, areas of lower diversity could be targeted for enhancement. Using this approach would also facilitate the development of simple metrics that can be used to quantify residual impacts much more effectively than focussing down to family, genus or species level.

This system is already being used for producing loss/gain calculations with a view to promoting the use of biodiversity offsetting as a means of mitigation for large infrastructure projects (National Assembly for Wales, 2014). This conservation tool was developed by Defra and assigns values to habitat types based on distinctiveness. These scores are then multiplied by the areas of habitat that will be lost in order to convert them into “biodiversity credits”. The total number of lost biodiversity credits is then calculated. To provide mitigation for this loss the developer then establishes what habitats would be recreated or enhanced elsewhere, and assigns scores for those areas based on the same criteria. The developer is then able to balance the equation to provide a neutral impact development, or more usually, attempt to create habitats with higher scores thereby providing a net gain in biodiversity value.

It is considered that this habitat level approach can be applied to mitigation for invertebrates because areas with higher distinctiveness values are invariably those habitats known to support higher numbers and diversities of invertebrates. By using biodiversity-offsetting to favour the creation and enhancement of species-rich grassland and wetland habitats in particular, terrestrial invertebrate diversity in the study area can be safeguarded and potentially improved.

The development of biodiversity offsetting is therefore fundamental in determining effective mitigation for the Project. In addition to favouring higher value habitats, overall structural heterogeneity is also considered to be important. The provision of different kinds of field boundary, plantation woodland and agricultural uses should therefore be considered in the long term for the management of the study area for promotion of an area with the potential to support an improving invertebrate diversity.

## 6. References

- Arup, (2011), *Terrestrial Invertebrate Interim Report*, unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd.
- Arup, (2012), *Terrestrial Invertebrate Interim Report*, unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd.
- Ball, S.G., (1986), *Terrestrial and freshwater invertebrates with Red Data Book, Notable or habitat indicator status*, Invertebrate Site Register internal report number 66, NCC.
- Buglife, (2015), [online], <https://www.buglife.org.uk/bugs-and-habitats/cinnabar-moth>, Accessed 30 July 2015.
- Butterfly Conservation, (2015), [online], <http://butterfly-conservation.org/51-1319/cinnabar.html>. Accessed 26 May 2015.
- Duff, A.G., (2012), *Checklist of Beetles of the British Isles*. Pemberley Books: Iver.
- Jacobs, (2014a), *Consultancy Report: Terrestrial Invertebrates Baseline Survey in 2013*, unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd. Ref. W202.01-S5-PAC-REP-00023.
- Jacobs, (2014b), *Consultancy Report: Addendum to Terrestrial Invertebrate Baseline Survey 2013 – Terrestrial Invertebrates Baseline Results for Additional Locations Surveys in 2014*, unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd. Ref. WN03.01.01-S5-PAC-REP-00015.
- Jacobs, (2015), *Consultancy Report: Wylfa Freshwater Baseline Surveys 2011-2014*, unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd. Ref. WN03.01.01-S5-PAC-REP-00020.
- National Assembly for Wales, (2014), *Research Paper: Biodiversity Offsetting*, Paper number 14/016.
- Natural England, (2014), *A review of the beetles of Great Britain: The Darkling Beetles and their allies*. Species Status No. 18., Natural England.
- Shirt, D.B., (1987), *British Red Data Books: 2 Insects*. Nature Conservancy Council: Peterborough.
- The Wildlife Trusts, (2015), [online], <http://www.wildlifetrusts.org/species/cinnabar>, Accessed 30 July 2015.
- UK BARS, (2015), [online], *Anglesey Local Biodiversity Action Plan*. [online], [https://ukbars.defra.gov.uk/archive/plans/lbap\\_plans.asp?LBAP=%7b42A89BF7-2E26-4C14-8253-40937ACA129D%7d](https://ukbars.defra.gov.uk/archive/plans/lbap_plans.asp?LBAP=%7b42A89BF7-2E26-4C14-8253-40937ACA129D%7d). Accessed 17 July 2015.
- UK Butterflies, (2015a), [online], <http://www.ukbutterflies.co.uk/species.php?species=semele>. Accessed 26 May 2015.
- UK Butterflies, (2015b), [online], <http://www.ukbutterflies.co.uk/species.php?species=pamphilus>. Accessed 26 May 2015.
- UK Butterflies, (2015c), [online], <http://www.ukbutterflies.co.uk/species.php?species=megera>. Accessed 26 May 2015.

## **Appendix A: Figures**

This page has been left blank.

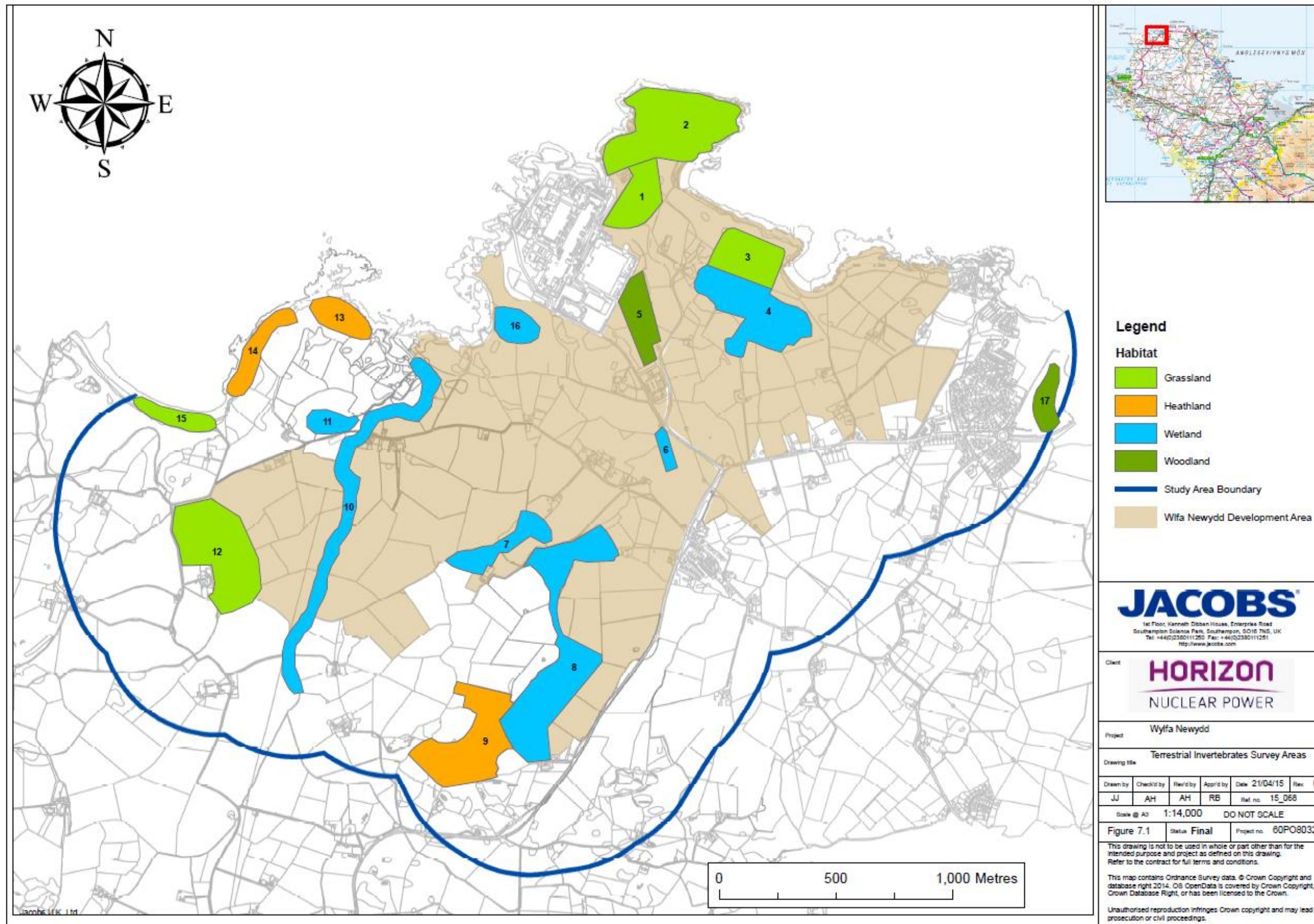


Figure 0.1: Study area and terrestrial invertebrate survey sites

## Appendix B: Notable Species Returned from Background Data

Order	Habit	Species	Red Data Book	Section 42 (UKBAP)	Non-Anglesey LBAP	Recorded during surveys
Lepidoptera	Butterfly	<i>Coenonympha pamphilus</i>	-	Yes	Yes	Yes
Lepidoptera	Butterfly	<i>Lasiommata megera</i>	-	Yes	Yes	Yes
Lepidoptera	Moth	<i>Tyria jacobaeae</i>	-	Yes	Yes	Yes
Lepidoptera	Butterfly	<i>Hipparchia semele</i>	-	Yes	-	Yes
Hymenopteran	Bumblebee	<i>Bombus (Bombus) terrestris</i>	-	-	Yes	Yes
Hymenopteran	Bumblebee	<i>Bombus (Melanobombus) lapidarius</i>	-	-	Yes	Yes
Hymenopteran	Bumblebee	<i>Bombus (Thoracobombus) pascuorum</i>	-	-	Yes	Yes
Odonata	Damselfly	<i>Ischnura elegans</i>	-	-	Yes	Yes
Odonata	Damselfly	<i>Pyrrhosoma nymphula</i>	-	-	Yes	Yes
Odonata	Dragonfly	<i>Sympetrum striolatum</i>	-	-	Yes	Yes
Lepidoptera	Butterfly	<i>Boloria selene</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Acronicta psi</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Acronicta rumicis</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Agrochola lychnidis</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Amphipoea oculea</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Amphipyra tragopoginis</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Apamea remissa</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Aporophyla lutulenta</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Arctia caja</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Blepharita adusta</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Brachylomia viminalis</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Caradrina morpheus</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Celaena haworthii</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Diarsia rubi</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Epirrhoë galiata</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Eugnorisma glareosa</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Eulithis mellinata</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Euxoa nigricans</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Euxoa tritici</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Hemistola chrysoprasaria</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Hepialus humuli</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Hoplodrina blanda</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Hydraecia micacea</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Malacosoma neustria</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Melananchra pisi</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Mesoligia literosa</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Mythimna comma</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Noctua orbona</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Rhizedra lutosa</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Scopula marginepunctata</i>	-	Yes	Yes	No

Order	Habit	Species	Red Data Book	Section 42 (UKBAP)	Non-Anglesey LBAP	Recorded during surveys
Lepidoptera	Moth	<i>Spilosoma lubricipeda</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Spilosoma luteum</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Stilbia anomala</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Tholera cespitis</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Trichiura crataegi</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Watsonalla binaria</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Xanthia icteritia</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Xylena exsoleta</i>	-	Yes	Yes	No
Lepidoptera	Moth	<i>Celaena leucostigma</i>	-	Yes	-	No
Lepidoptera	Moth	<i>Cosmia diffinis</i>	-	Yes	-	No
Lepidoptera	Moth	<i>Orthonama vittata</i>	-	Yes	-	No
Lepidoptera	Moth	<i>Tholera decimalis</i>	-	Yes	-	No
Lepidoptera	Moth	<i>Xanthorhoe decoloraria</i>	-	Yes	-	No
Lepidoptera	Moth	<i>Xanthorhoe ferrugata</i>	-	Yes	-	No
Hymenopteran	Bumblebee	<i>Bombus (Psithyrus) campestris</i>	-	-	Yes	No
Hymenopteran	Bumblebee	<i>Bombus (Pyrobombus) jonellus</i>	-	-	Yes	No
Lepidoptera	Butterfly	<i>Argynnis aglaja</i>	-	-	Yes	No
Odonata	Damselfly	<i>Ischnura pumilio</i>	Yes	-	Yes	No
Odonata	Damselfly	<i>Enallagma cyathigerum</i>	-	-	Yes	No
Odonata	Damselfly	<i>Lestes sponsa</i>	-	-	Yes	No
Odonata	Dragonfly	<i>Aeshna juncea</i>	-	-	Yes	No
Odonata	Dragonfly	<i>Sympetrum danae</i>	-	-	Yes	No
Lepidoptera	Moth	<i>Agrotis cinerea</i>	-	-	Yes	No
Lepidoptera	Moth	<i>Agrotis trux</i>	-	-	Yes	No
Lepidoptera	Moth	<i>Celastrina argiolus</i>	-	-	Yes	No
Lepidoptera	Moth	<i>Coenagrion puella</i>	-	-	Yes	No
Lepidoptera	Moth	<i>Synansphecia muscaeformis</i>	-	-	Yes	No
Coleoptera	Beetle	<i>Gyrinus natator</i>	Yes	-	-	No
Coleoptera	Beetle	<i>Hydrophilus piceus</i>	Yes	-	-	No
Coleoptera	Beetle	<i>Cryptorhynchus lapathi</i>	Yes	-	-	No
Lepidoptera	Moth	<i>Lymantria dispar</i>	Yes	-	-	No
Lepidoptera	Moth	<i>Malacosoma castrensis</i>	Yes	-	-	No
Lepidoptera	Moth	<i>Peribatodes secundaria</i>	Yes	-	-	No
Lepidoptera	Moth	<i>Xanthorhoe biriviata</i>	Yes	-	-	No
Lepidoptera	Moth	<i>Crambus pratella</i>	Yes	-	-	No

## Appendix C: Notable Species Recorded in the Study Area – All years

This page has been left blank.

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Designation	Order	Family	Habit	Habitat
<i>Acupalpus dubius</i>	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Carabidae	Ground beetle	Heath	
<i>Acupalpus parvulus</i>	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	Local	Coleoptera	Carabidae	Ground beetle	Hygrophilous	
<i>Admontia grandicornis</i>	-	-	-	P	P	-	-	P	-	-	-	-	-	-	-	-	Local	Diptera	Tachinidae	Fly	Unknown	
<i>Agathidium laevigatum</i>	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	Local	Coleoptera	Leiodidae	Beetle	Woodland	
<i>Agonum emarginatum</i>	-	-	-	-	P	-	-	-	-	P	-	-	-	-	-	-	Local	Coleoptera	Carabidae	Ground beetle	Hygrophilous	
<i>Amara lunicollis</i>	P	-	-	-	P	-	-	-	P	P	P	P	-	-	-	-	Local	Coleoptera	Carabidae	Ground beetle	Hygrophilous	
<i>Anasimyia interpuncta</i>	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	Nationally Scarce	Diptera	Syrphidae	Hover Fly	Hygrophilous	
<i>Anisosticta novemdecimpunctata</i>	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	Local	Coleoptera	Coccinellidae	Ladybird	Hygrophilous	
<i>Anthonomus brunnipennis</i>	-	-	-	-	-	-	-	-	P	-	-	-	P	-	-	-	Local	Coleoptera	Curculionidae	Weevil	Unknown	
<i>Aphthona nonstriata</i>	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Chrysomelidae	Leaf beetle	Hygrophilous	
<i>Atheta vaga</i>	-	-	-	-	P	P	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Staphylinidae	Rove beetle	Unknown	
<i>Badister dilatatus</i>	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	notable b	Coleoptera	Carabidae	Ground beetle	Hygrophilous	
<i>Bembidion mannerheimi</i>	-	-	-	P	-	-	-	-	P	-	-	-	-	-	-	-	Local	Coleoptera	Carabidae	Ground beetle	Unknown	
<i>Beris clavipes</i>	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	Nationally Notable	Diptera	Stratiomyidae	Soldier Fly	Unknown	
<i>Caenopsis waltoni</i>	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Curculionidae	Weevil	Heath	
<i>Cafius fucicola</i>	-	-	-	P	-	-	-	-	-	-	P	-	-	-	-	-	Local	Coleoptera	Staphylinidae	Rove beetle	Unknown	
<i>Cantharis thoracica</i>	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Cantharidae	Soldier beetle	Hygrophilous	
<i>Cassida hemisphaerica</i>	-	-	-	-	-	-	-	P	-	P	-	P	-	-	-	-	Notable A	Coleoptera	Chrysomelidae	Leaf beetle	Grassland - generalist	
<i>Catapion pubescens</i>	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Notable B	Coleoptera	Curculionidae	Weevil	Grassland - generalist	
<i>Chilocorus bipustulatus</i>	-	-	-	-	-	-	-	-	P	-	P	-	-	-	-	-	Local	Coleoptera	Coccinellidae	Ladybird	Heath	
<i>Chlaenius nigricornis</i>	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	Local	Coleoptera	Carabidae	Ground beetle	Hygrophilous	
<i>Chrysolina banksi</i>	-	-	-	-	-	-	P	P	-	P	-	-	-	-	-	-	Local	Coleoptera	Chrysomelidae	Leaf beetle	Grassland - generalist	
<i>Chrysolina brunsvicensis</i>	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	Local	Coleoptera	Chrysomelidae	Leaf beetle	Unknown	
<i>Chrysolina haemoptera</i>	-	P	-	-	-	-	-	-	P	-	P	P	-	-	-	-	Notable B	Coleoptera	Chrysomelidae	Leaf beetle	Scrub	
<i>Coelositona cambricus</i>	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Curculionidae	Weevil	Grassland - generalist	
<i>Coenonympha pamphilus</i>	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	S42	Lepidoptera	Nymphalidae	Butterfly	Heath	
<i>Coenosia lacteipennis</i>	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	Local	Diptera	Muscidae	Fly	Unknown	
<i>Cytinus sericeus</i>	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Byrrhidae	Pill beetle	Grassland - generalist	
<i>Dolichopus notatus</i>	-	-	-	P	-	-	P	-	-	-	-	-	-	-	-	-	Nationally Scarce	Diptera	Dolichopodidae	Fly	Unknown	
<i>Dolichopus signifer</i>	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	Local	Diptera	Dolichopodidae	Fly	Unknown	
<i>Donacia simplex</i>	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Chrysomelidae	Leaf beetle	Hygrophilous	
<i>Dryops ernesti</i>	-	-	-	P	P	-	-	-	P	-	-	-	-	-	-	-	Local	Coleoptera	Dryopidae	Marsh beetle	Hygrophilous	

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Designation	Order	Family	Habit	Habitat
<i>Dyschirius globosus</i>	-	P	-	-	-	-	-	-	-	-	-	P	-	-	-	-	Local	Coleoptera	Dyschirius	Ground beetle	Hygrophilous	
<i>Erioptera nielseni</i>	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	Nationally Notable	Diptera	Limoniidae	Cranefly	Hygrophilous	
<i>Galerucella sagittariae</i>	-	-	-	-	-	-	P	-	-	-	-	-	-	-	P	P	Local	Coleoptera	Chrysomelidae	Leaf beetle	Hygrophilous	
<i>Glochinus punctiger</i>	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	Notable B	Coleoptera	Curculionidae	Weevil	Grassland - generalist	
<i>Gnypeta carbonaria</i>	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Staphylinidae	Rove beetle	Unknown	
<i>Graptus triguttatus</i>	-	P	P	P	P	-	-	-	-	-	-	P	-	-	-	-	Local	Coleoptera	Curculionidae	Weevil	Hygrophilous	
<i>Gymnusa brevicollis</i>	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	Local	Coleoptera	Staphylinidae	Rove beetle	Unknown	
<i>Hypera pollux</i>	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Curculionidae	Weevil	Hygrophilous	
<i>Ischnopterapion modestum</i>	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Curculionidae	Weevil	Unknown	
<i>Lasiommata mergera</i>	-	-	-	-	P	-	-	P	P	-	P	-	P	-	-	-	S42	Lepidoptera	Nymphalidae	Butterfly	Grassland - generalist	
<i>Leistus fulvibarbis</i>	-	-	-	-	P	-	-	P	P	P	-	P	-	-	P	Local	Coleoptera	Carabidae	Ground beetle	Woodland		
<i>Lema cyanella</i>	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Chrysomelidae	Leaf beetle	Grassland - improved	
<i>Lonchaea corusca</i>	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	Nationally Notable	Diptera	Lonchaeidae	Lance fly	Unknown	
<i>Longitarsus exoletus</i>	-	P	-	-	-	-	-	-	-	P	-	-	-	-	-	-	Local	Coleoptera	Chrysomelidae	Leaf beetle	Unknown	
<i>Macquartia tenebricosa</i>	-	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	Local	Diptera	Tachinidae	Tachinid fly	Unknown	
<i>Mantura chrysanthemi</i>	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	Local	Coleoptera	Chrysomelidae	Leaf beetle	Grassland - unimproved	
<i>Margarinotus neglectus</i>	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Histeridae	Histerid beetle	Unknown	
<i>Microdota boreella</i>	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Staphylinidae	Rove beetle	Unknown	
<i>Molophilus pleuralis</i>	-	-	-	P	-	-	-	-	-	-	P	P	-	-	-	-	Local	Diptera	Limoniidae	Cranefly	Hygrophilous	
<i>Mydaea ancilla</i>	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	Local	Diptera	Muscidae	Fly	Unknown	
<i>Neliocarus nebulosus</i>	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Curculionidae	Weevil	Grassland - generalist	
<i>Notiophilus aquaticus</i>	P	P	-	-	-	-	-	-	-	-	P	-	-	-	-	-	Local	Coleoptera	Carabidae	Ground beetle	Grassland - unimproved	
<i>Notiophilus germinyi</i>	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	Local	Coleoptera	Carabidae	Ground beetle	Grassland - unimproved	
<i>Notiophilus substriatus</i>	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Carabidae	Ground beetle	Grassland - generalist	
<i>Ocyphus aeneocephalus</i>	-	P	-	-	-	-	-	-	P	P	P	P	-	-	-	-	Local	Coleoptera	Staphylinidae	Rove beetle	Grassland - generalist	
<i>Oedemera lurida</i>	P	-	-	-	P	-	P	-	P	-	P	-	-	P	P	-	Local	Coleoptera	Oedemeridae	Blister beetle	Grassland - generalist	
<i>Pachybrachius fracticollis</i>	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	Local	Hemiptera	Lygaeidae	True bug	Hygrophilous	
<i>Paederus riparius</i>	-	-	-	P	P	-	-	P	P	-	P	-	-	-	-	-	Local	Coleoptera	Staphylinidae	Rove beetle	Unknown	
<i>Perapion immune</i>	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Curculionidae	Weevil	Unknown	
<i>Perapion marchicum</i>	P	-	-	-	-	-	-	-	P	-	P	-	-	-	-	-	Local	Coleoptera	Curculionidae	Weevil	Grassland - improved	
<i>Phaedon tumidulus</i>	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Chrysomelidae	Leaf beetle	Grassland - generalist	
<i>Phalacrocerata replicata</i>	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	Nationally Notable	Diptera	Tipulidae	Cranefly	Hygrophilous	
<i>Philonthus nigrita</i>	-	-	-	-	-	-	P	-	P	-	P	-	P	-	-	-	Local	Coleoptera	Staphylinidae	Rove beetle	Unknown	
<i>Philarhizus notatus</i>	-	-	-	-	-	-	-	-	P	-	P	-	-	-	-	-	Local	Coleoptera	Carabidae	Ground beetle	Grassland - unimproved	

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Designation	Order	Family	Habit	Habitat
<i>Phylidorea abdominalis</i>	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	-	Nationally Notable	Diptera	Limoniidae	Cranefly	Hygrophilous	
<i>Phyllobius virideaeiris</i>	P	-	-	-	-	-	-	P	-	P	-	-	-	-	-	-	Local	Coleoptera	Curculionidae	Weevil	Grassland - generalist	
<i>Phyllotreta exclamationis</i>	-	-	-	-	-	-	-	-	P	P	-	-	-	-	-	-	Local	Coleoptera	Chrysomelidae	Leaf beetle	Hygrophilous	
<i>Pirapion immune</i>	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	Local	Coleoptera	Apionidae	Weevil	Unknown	
<i>Plateumaris discolor</i>	-	-	-	P	-	-	-	P	P	-	-	-	-	-	-	-	Local	Coleoptera	Chrysomelidae	Leaf beetle	Hygrophilous	
<i>Platydracus stercorarius</i>	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	Local	Coleoptera	Staphylinidae	Rove beetle	Hygrophilous	
<i>Prasocuris junci</i>	-	P	-	-	P	P	P	P	-	P	P	-	-	-	-	-	Local	Coleoptera	Chrysomelidae	Leaf beetle	Hygrophilous	
<i>Psylliodes picina</i>	-	-	-	-	-	-	-	-	P	P	-	-	-	-	-	-	Local	Coleoptera	Chrysomelidae	Leaf beetle	Unknown	
<i>Rhacognathus punctatus</i>	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	Local	Hemiptera	Pentatomidae	Shieldbug	Heath	
<i>Rhinoncus bruchoides</i>	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	Local	Coleoptera	Curculionidae	Weevil	Unknown	
<i>Silpha tristis</i>	P	P	-	-	P	P	-	-	P	P	P	P	P	-	-	-	Local	Coleoptera	Silphidae	Beetle	Unknown	
<i>Sitona lineellus</i>	-	-	-	-	-	-	-	-	-	-	-	P	-	-	-	-	Local	Coleoptera	Curculionidae	Weevil	Grassland - unimproved	
<i>Staphylinus erythropterus</i>	-	-	-	-	P	-	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Staphylinidae	Rove beetle	Unknown	
<i>Stenus cicindeloides</i>	-	-	-	-	-	P	-	-	P	-	-	-	-	-	-	-	Local	Coleoptera	Staphylinidae	Rove beetle	Hygrophilous	
<i>Stictotarsus duodecimpustulatus</i>	-	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	Local	Coleoptera	Dytiscidae	Water beetle	Aquatic	
<i>Synapion ebeninum</i>	-	-	-	-	P	-	-	-	P	-	-	-	-	-	-	-	Local	Coleoptera	Curculionidae	Weevil	Grassland - unimproved	
<i>Tachinus laticollis</i>	-	-	-	-	-	-	-	-	P	-	-	-	-	-	-	-	Local	Coleoptera	Staphylinidae	Rove beetle	Unknown	
<i>Tachyporus atriceps</i>	P	P	-	-	-	-	-	-	-	-	-	P	-	-	-	-	Local	Coleoptera	Staphylinidae	Rove beetle	Unknown	
<i>Tachyporus pallidus</i>	-	-	-	-	-	-	P	-	-	P	-	-	-	-	-	-	Local	Coleoptera	Staphylinidae	Rove beetle	Unknown	
<i>Trichosirocalus troglodytes</i>	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Local	Coleoptera	Curculionidae	Weevil	Grassland - improved	
<i>Tyria jacobaeae</i>	P	-	-	-	P	-	-	-	-	-	P	-	-	-	-	-	S42	Lepidoptera	Arctiidae	Moth	Grassland - improved	
Total	15	13	1	15	17	3	8	9	14	18	22	12	17	7	2	2	2					



---

**Site Preparation and Clearance  
Environmental Statement  
Volume 3 – Appendix 14-08  
Consultancy Report: NPS Site Great  
Crested Newt Baseline Surveys 2014**

---

[This page is intentionally blank]



## Wylfa Newydd

Horizon Nuclear Power (Wylfa) Ltd

### Technical Summary Report - Great Crested Newt

60PO8058/TER/REP/010 | Rev 1

September 2016

WN034-JAC-PAC-REP-00120

#### Document history and status

Revision	Date	Description	By	Review	Approved
Rev 1	28/09/16	First version	J. Jackson	N. Clark	R. Bromley
Rev 2	05/06/17	Amendments following HNP comment	N Clark	J Barnes	

#### Distribution of copies

Revision	Issue approved	Date issued	Issued to	Comments

## Wylfa Newydd

Project No: 60PO8058  
Document Title: Technical Summary Report - Great Crested Newt  
Document No.: 60PO8058/TER/REP/010  
Revision: Rev 1  
Date: September 2016  
Client Name: Horizon Nuclear Power (Wylfa) Ltd  
Client No: WN034-JAC-PAC-REP-00120  
Project Manager: Rob Bromley  
Author: Jonathan Jackson  
File Name: \\SOUFIL01\Projects\\$PROJECTS\\$B1496000 Wylfa Marine Services\6. Reports\14. Terrestrial reports\18. Great crested newt\GCN TSR 2016\WN034-JAC-PAC-REP-00120 GCN TSR 2016 issued to RB 20 10 16.docx

Jacobs U.K. Limited

Kenneth Dibben House  
Enterprise Road, Southampton Science Park  
Chilworth, Southampton SO16 7NS  
United Kingdom  
T +44 (0)23 8011 1250  
F +44 (0)23 8011 1251  
[www.jacobs.com](http://www.jacobs.com)

© Copyright 2016 Jacobs U.K. Limited. The concepts and information contained in this document are the property of Jacobs. Use or copying of this document in whole or in part without the written permission of Jacobs constitutes an infringement of copyright.

Limitation: This report has been prepared on behalf of, and for the exclusive use of Jacobs' Client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

## Contents

<b>Terms and Definitions .....</b>	i
<b>Executive Summary.....</b>	1
<b>1. Introduction.....</b>	2
1.1 Overview.....	2
1.2 Wylfa Newydd Project .....	2
1.3 Site Description .....	2
1.4 Report Aims and Objectives.....	3
1.5 Previous Work Summarised in this Report.....	3
<b>2. Methodology .....</b>	4
2.1 Pond Scoping Surveys .....	4
2.2 Presence or Likely Absence Surveys.....	5
2.3 Environmental DNA Testing .....	5
2.4 Habitat Site Audit.....	5
<b>3. Results.....</b>	6
3.1 Surveys of Ponds within the Wylfa Newydd Development Area 2010 to 2013.....	6
3.2 Surveys of Ponds within the Wylfa Newydd Development Area and 500m buffer zone in 2014.....	6
3.3 Surveys of Ponds to the South of the Wylfa Newydd Development Area in 2016.....	6
3.4 Surveys of Ponds within 250m of A5025 improvements in 2016.....	6
Pond 37 had previously been scoped out from surveys in 2010, 2011, 2012 and 2014 as it was not holding sufficient water to be considered suitable to support the species. During the 2016 surveys this pond was found to be holding sufficient water to enable survey effort. ....	7
<b>4. Conclusion .....</b>	7
<b>5. References .....</b>	8

## Appendix A. Figures

## Terms and Definitions

Term	Definition
A5025 improvements	These are proposals to improve a section of the A5025 to the west of Cemaes. The study area to establish the baseline environmental conditions includes a buffer zone of 250m on either side of the existing road and therefore includes a proportion of the Wylfa Newydd Development Area.
eDNA	Environmental DNA
EPSML	European Protected Species Mitigation Licence
GCN	Great crested newt <i>Triturus cristatus</i>
HSI	Habitat Suitability Index
SPC Application Site	The Site Preparation and Clearance (SPC) Application Site is the area of land within the Wylfa Newydd Development Area that will be cleared in preparation for the activities associated with construction of the Wylfa Newydd Generating Station.
The Project	The Project comprises the Wylfa Newydd Generating Station, including the reactors, associated plant, Ancillary Structures and features, together with all of the development needed to support its delivery, such as highway improvements, worker accommodation and specialist training facilities.
Wylfa Newydd Development Area	The Wylfa Newydd Development Area is the indicative area of land and sea, including the Power Station Site and the surrounding areas that would be used for the construction and operation of the Wylfa Newydd Generating Station.

## Executive Summary

Horizon Nuclear Power Wylfa Limited (Horizon) is planning to develop a new Nuclear Power Station on Anglesey (the Wylfa Newydd Generating Station) as identified in the National Policy Statement for Nuclear Power Generation (EN-6) (Department of Energy and Climate Change, 2011). The Wylfa Newydd Project will require a number of applications to be made under different legislation to different regulators. Jacobs U.K. Limited (Jacobs) was commissioned to collect baseline data to inform the various applications, assessments and permits that will be submitted for approval to construct and operate the Wylfa Newydd Generating Station.

This technical summary report provides a synopsis of the great crested newt (GCN) surveys completed to date within the Wylfa Newydd Development Area and a 500m buffer zone. Surveys between 2010 and 2014 did not record GCN within the Wylfa Newydd Development Area or the 500m buffer surrounding this. However, one adult GCN was found during National Vegetation Classification surveys within the Cae Gwyn Site of Special Scientific Interest (SSSI).

In 2016, eDNA surveys indicated that there is one pond within the Wylfa Newydd Development Area where GCN have been present. This pond (Pond 37) is located in a small area of marshy grassland within a large field to the west of the access road leading to the existing power station. A further three waterbodies were found to support GCN to the south of the Wylfa Newydd Development Area within the 500m buffer zone.

This report provides an assessment of likely risks of GCN being affected by the project, and suggests that, due to the low population sizes recorded and the low quality of the majority of habitats present, the risk of GCN being found within the Wylfa Newydd Development Area, in areas of terrestrial habitat beyond 250m from ponds is probably unlikely. It is therefore proposed that this forms the basis for assessment of effects and the mitigation strategy.

The mitigation strategy for effects on GCN would need to include measures to prevent killing and injuring individuals and provide suitable alternative habitat to compensate for that being lost. This would need to be carried out under a European Protected Species mitigation licence (EPSML) granted by Natural Resources Wales. In order to determine a licence application, population estimates would need to be provided for all ponds with GCN presence. Based on this requirement it is therefore recommended that all ponds within the Wylfa Newydd Development Area and 500m buffer are resurveyed in the 2017 breeding season to inform a comprehensive licence application.

## 1. Introduction

Great crested newts are a European protected species, with legislation to prevent actions that would kill or injure individuals, or affect their habitats. In the context of assessment of effects caused by the Wylfa Newydd Project they are therefore a receptor to be considered from an environmental impact assessment perspective and from the perspective of legislative compliance. This report provides a technical summary of the data collected on GCN during surveys completed between 2010 and 2016.

### 1.1 Overview

Horizon is currently planning to develop a new Nuclear Power Station on Anglesey, as identified in the National Policy Statement for Nuclear Power Generation (EN-6) (Department of Energy and Climate Change, 2011). The Wylfa Newydd Project comprises the Wylfa Newydd Generating Station, including the reactors, associated plant and Ancillary Structures and features, together with all of the development needed to support its delivery, such as highway improvements, worker accommodation and specialist training facilities. The Wylfa Newydd Project ('the Project') will require a number of applications to be made under different legislation to different regulators. As a Nationally Significant Infrastructure Project under the Planning Act 2008, the construction and operation must be authorised by a development consent order.

### 1.2 Wylfa Newydd Project

The Wylfa Newydd Project includes the Wylfa Newydd Generating Station and Associated Development<sup>1</sup>. The Wylfa Newydd Generating Station includes two UK Advanced Boiling Water Reactors to be supplied by Hitachi-GE Nuclear Energy Ltd, associated plant and Ancillary Structures and features. In addition to the reactors, development on the Power Station Site (the indicative area of land and sea within which the majority of the permanent Wylfa Newydd Generating Station buildings, plant and structures would be situated) would include steam turbines, control and service buildings, operational plant, radioactive waste storage buildings, Ancillary Structures, offices and coastal developments. The coastal developments would include a Cooling Water System and breakwater, and a Marine Off-Loading Facility.

### 1.3 Site Description

The Wylfa Newydd Development Area (the indicative areas of land and sea, including the Power Station Site, the Wylfa National Policy Statement<sup>2</sup> Site and the surrounding areas that would be used for the construction and operation of the Wylfa Newydd Generating Station) covers an area of approximately 380 ha. It is bounded to the north by the coast and the existing Magnox power station (the Existing Power Station). To the east, it is separated from Cemaes by a narrow corridor of agricultural land. The A5025 and residential properties define part of the south-east boundary, with a small parcel of land spanning the road to the north-east of Tregele. To the south and west, the Wylfa Newydd Development Area abuts agricultural land, and to the west it adjoins the coastal hinterland.

The Wylfa Newydd Development Area is dominated by low-quality agricultural land comprising improved grassland and poor semi-improved grassland. Other habitats present include isolated areas of gorse (*Ulex europaeus*) scrub, and pockets of marshy grassland associated with hollows and drainage features, including ponds. Additionally, the areas immediately surrounding the Existing Power Station to the south and east are predominantly conifer plantations.

The field boundaries within the Wylfa Newydd Development Area and surrounding area are generally traditional clawdd walls: earth banks faced with stone, often colonised with gorse and hawthorn (*Crataegus monogyna*) scrub. Where the banks have collapsed, the vegetation more closely resembles hedges.

<sup>1</sup> Development needed to support delivery of the Wylfa Newydd Generating Station is referred to as 'Associated Development'. This includes highway improvements along the A5025, Park and Ride Facilities for construction workers, Logistics Centre, Temporary Worker Accommodation, specialist training facilities, Horizon's Visitor Centre and media briefing facilities.

<sup>2</sup> The site identified on Anglesey by the National Policy Statement for Nuclear Power Generation (EN-6) (Department of Energy and Climate Change, 2011) as potentially suitable for the deployment of a new Nuclear Power Station.

## 1.4 Report Aims and Objectives

The purpose of this report is to provide a single resource covering all survey and background data available for GCN from within the Wylfa Newydd Development Area and surrounding 500m buffer zone, to inform and support ecological chapters of environmental impact assessments for each stage of the Project.

The aims of the report will be achieved by:

- reviewing the background data available on the species;
- presenting the results of surveys completed in 2016; and,
- interpreting the results of the surveys and provide mitigation recommendations.

## 1.5 Previous Work Summarised in this Report

Great crested newt surveys have taken place within the Wylfa Newydd Development Area each year between 2010 and 2013 (Arup, 2013) but did not include a 500m buffer zone. This was an important omission from previous survey work. Great crested newt are able to travel up to 500m from breeding ponds to forage and hibernate meaning that their presence in the 500m buffer zone could also mean presence within the Wylfa Newydd Development Area, depending on the suitability of habitats present.

A Phase 1 habitat survey was completed in 2013 (Jacobs, 2013a), and identified suitable habitat for breeding, foraging and hibernating GCN in the Wylfa Newydd Development Area and 500m buffer zone. A botanical survey was also completed within the Cae Gwyn SSSI (Jacobs, 2015), during which a single GCN was recorded in terrestrial habitats.

In 2014, GCN surveys of all accessible ponds within the Wylfa Newydd Development Area and 500m buffer zone were visited as part of a scoping exercise to determine suitability to support the species (Jacobs, 2014). This was completed using the Habitat Suitability Index (HSI) methodology developed by Oldham *et al.* (2000), making reference to the results from previous GCN survey results from Arup and data gathered during Phase 1 habitat surveys in 2013. The wetland habitats and ponds within the buffer zone near to Cae Gwyn SSSI were not accessible at this time.

Further to the scoping surveys, each suitable and accessible pond was visited a minimum of four times for the purposes of completing presence or likely absence surveys during the breeding season of 2014. These surveys excluded ponds to the south of the Wylfa Newydd Development Area where access permission was not granted. These surveys also excluded ponds to the south of the A5025 road as this is considered to act as a barrier to dispersal to GCN. Any population of GCN breeding in ponds to the south of the A5025 would therefore not be affected by the Project.

In 2016, access permission was granted to ponds to the south of the Wylfa Newydd Development Area. These were then scoped according to the same method applied in 2014, and those ponds considered to be suitable to support GCN were visited four times using the same presence or likely absence approach used in 2014. Those ponds where GCN were found were then surveyed on a further two occasions to provide a population estimate. In addition to this, water from each suitable pond was tested for the presence of environmental DNA (eDNA).

Further surveys of all suitable ponds within 250m of the northern section of the A5025 where improvement works are planned (referred to hereafter as “A5025 improvements”), were undertaken in June 2016. Given the time of year these ponds were surveyed, only eDNA sampling was undertaken. A number of these ponds were located within the Wylfa Newydd Development Area.

In August 2016, an audit of the habitats within the Site Preparation and Clearance (SPC) Application Site was undertaken. This recorded the potential suitability to support GCN of all habitats that are likely to be lost during the SPC works.

## 2. Methodology

The Wylfa Newydd Development Area and 500m buffer zone, SPC Application Site and area comprising the A5025 improvements are shown in figure 1.

### 2.1 Pond Scoping Surveys

Waterbody suitability for breeding GCN was established using a two-stage approach. Waterbodies were initially visited to determine their presence and general suitability. This included eliminating ponds that were unsuitable based on factors that are directly prohibitive to GCN breeding including:

- ditches that were flowing;
- waterbodies that were polluted; and
- waterbodies that were dry or virtually dry and deemed unlikely to hold water during the GCN breeding season most years.

Waterbodies that were eliminated were not surveyed further. If a waterbody was determined to be suitable for GCN then an HSI was completed to quantify the suitability.

The HSI assessment followed the method developed by Oldham *et al.* (2000). The assessment protocol uses ten suitability indices that are each given a score. All of the indices are factors thought to affect the suitability of a waterbody for breeding GCN. The ten indices are then converted and combined to give a suitability index of between 0.01 and 1. The ten factors are:

- geographical location;
- pond area;
- pond permanence;
- water quality;
- shade;
- waterfowl presence;
- fish presence;
- presence of other ponds within 1km of pond being surveyed;
- terrestrial habitat nearby; and
- macrophyte cover.

A low HSI score indicates that the waterbody is less suitable for breeding GCN, whereas a higher score indicates a greater suitability. There are five categories into which suitability is divided, as shown in Table 2.1.

**Table 2.1 HSI score application**

<b>HSI score</b>	<b>Pond suitability</b>
< 0.5	Poor
0.5 – 0.59	Below Average
0.6 – 0.69	Average
0.7 – 0.79	Good
> 0.8	Excellent

A low score does not necessarily mean that GCN will be absent from any given pond, neither does a high score indicate that GCN will be present. The score is a useful indication of possible presence as there is a strong correlation between high scores and higher numbers of newts. The information from HSI analysis is also a requirement of any European Protected Species Mitigation Licence applications. The use of HSI assessment is inappropriate for ditches, so the suitability of ditches was therefore determined by more qualitative means using the experience of the survey team.

## **2.2 Presence or Likely Absence Surveys**

The surveys were led by surveyors who hold licences granted by Natural Resources Wales (NRW) to survey for the species. Surveys were carried out in suitable weather conditions: when there was little wind, no rain and ambient temperatures were above 5°C.

Field surveys were undertaken according to standard methods (English Nature, 2001; Froglife, 2001; and Langton *et al.*, 2001). Methods included wherever possible, the deployment of bottle traps, egg searching, netting, and torching. A minimum of three survey methods were applied at each pond or ditch to fulfil the criteria of a robust survey.

The standard number of survey visits required to determine likely absence is four and, where possible, this is the number of survey visits at each pond that were completed. The surveys were completed at the correct time of year for GCN surveys i.e. between mid-March and mid-June, with at least two surveys of each pond being completed between mid-April and mid-May to coincide with the peak of newt breeding activity. Where GCN were detected during the first four surveys, an additional two visits were made, timed so at least three visits were undertaken during the period of peak breeding activity. Six visits is the minimum number required to establish a population estimate for a pond. Population estimates are based on the maximum count of adults on a single survey visit using a single survey method.

## **2.3 Environmental DNA Testing**

The eDNA surveys were undertaken according to standard methods approved by Natural England (Biggs *et al.*, 2014), comprising the collection of water samples water from ponds using sterile equipment which are then sent for laboratory analysis (Nature Metrics) to detect the presence or absence of GCN DNA within the sample.

## **2.4 Habitat Site Audit**

The SPC Application was surveyed on foot with all areas of habitat being assigned a suitability rating according to the criteria present in Table 2.2.

**Table 2.2 Habitat audit suitability criteria**

<b>Habitat suitability category</b>	<b>Habitat type examples</b>	<b>Potential to support amphibians and reptiles</b>
1	Short grassland, fields of arable crops, bare ground and hard standing, field boundaries with minimal associated habitat e.g. fence lines.	Negligible
2	Small areas (<20m <sup>2</sup> ) of rank grassland/scrub, gardens, linear features with some associated habitat e.g. small cloddiau, small hedges or fence lines with up to 1m of vegetation either side.	Low/medium
3	Larger areas of rank grassland/scrub (>20m <sup>2</sup> ), woodland and field boundaries e.g. large cloddiau, large hedges or fence lines with more than 1m of vegetation either side.	High

### 3. Results

#### 3.1 Surveys of Ponds within the Wylfa Newydd Development Area 2010 to 2013

Scoping and presence or likely absence surveys of all accessible ponds with the potential to support GCN was completed by Arup in 2010, 2011 and 2012 (Arup, 2013) within the Wylfa Newydd Development Area. These surveys did not record any GCN.

As discussed in Section 1.5, a single GCN was recorded in Cae Gwyn SSSI during a botanical survey (Jacobs, 2015). This was therefore not during GCN surveys but did influence the scope of future surveys.

#### 3.2 Surveys of Ponds within the Wylfa Newydd Development Area and 500m buffer zone in 2014

Jacobs completed scoping and presence or likely absence surveys in 2014 of waterbodies within the Wylfa Newydd Development Area and a 500m buffer zone (Jacobs, 2014). These surveys did not record any GCN.

Due to access constraints the 2014 surveys did not include ponds to the south of the Wylfa Newydd Development Area in the vicinity of Cae Gwyn SSSI where the incidental GCN was recorded.

#### 3.3 Surveys of Ponds to the South of the Wylfa Newydd Development Area in 2016

Initial assessment of ponds to the south of the Wylfa Newydd Development Area found that there were five waterbodies with the potential to support the species. These comprised four discrete ponds and much of the Cae Gwyn SSSI where there were small pockets of standing water in between tall tussocks of fen vegetation. The results from the presence or likely absence surveys and eDNA results are present in Table 3.1. The locations of the ponds where GCN or their eDNA was recorded is provided in **Error! Reference source not found..**

Table 3.1 Results following surveys of ponds to the south of the Wylfa Newydd Development Area

Pond	Presence confirmed		Population size
	Presence or likely absence surveys	eDNA surveys	
7	Absent	Absent	N/A
10	Absent	Absent	N/A
11a	Present	Present	Maximum count of seven = Low population
11b	Absent	Present	Unknown <sup>3</sup>
Cae Gwyn SSSI	Present	Absent	Maximum count of one = Low population

#### 3.4 Surveys of Ponds within 250m of A5025 improvements in 2016

Scoping of ponds for the A5025 improvements found that there were five waterbodies to the north of the A5025 within the Wylfa Newydd Development Area with the potential to support GCN. Samples of water were taken from all of these ponds and were tested for the presence of GCN DNA. The results from those tests found that there was one pond with GCN DNA present. This is identified as Pond 37 on figure 1 and is the only known record of GCN from within the Wylfa Newydd Development Area.

<sup>3</sup> The results from eDNA sampling cannot be used to establish whether GCN are using a pond for breeding or what the population size is.

Pond 37 had previously been scoped out from surveys in 2010, 2011, 2012 and 2014 as it was not holding sufficient water to be considered suitable to support the species. During the 2016 surveys this pond was found to be holding sufficient water to enable survey effort. Conclusion

Baseline surveys undertaken between 2010 and 2014 found no evidence of GCN within the survey area although there were limitations to these surveys due to land access restrictions. Separate to these surveys, a single GCN was recorded incidentally at Cae Gwyn SSSI. In 2016, follow-up surveys confirmed GCN presence in Pond 37 and a low population of GCN in ponds to the south of the Wylfa Newydd Development Area, close to Cae Gwyn SSSI. No population data was gathered for Pond 37 in 2016 but given its ephemeral nature, an absence of historic records, and the large distance between it and the next closest known GCN population (1.5km away), it is anticipated that Pond 37 will support a low population.

Most of the Wylfa Newydd Development Area, including the area within 500m of known GCN ponds, provides sub-optimal terrestrial habitat for GCN. Maximum routine GCN migration distances are estimated as being 250m from breeding ponds although GCN generally remain in 'core' habitat within approximately 100m of their breeding ponds (English Nature, 2004). Figure 1 shows the location of GCN ponds together with buffer zones of 500m around these ponds.

An EPSML would be required for any works affecting suitable terrestrial habitats within 250m of ponds that support GCN and that are not separated from the works area by significant barriers to dispersal e.g. roads. The EPSML would include a detailed mitigation strategy to demonstrate how the works would remain compliant with the *Conservation of Habitats and Species Regulations 2010* (as amended). To inform an EPSML application, full pre-construction surveys would need to be completed of all ponds within the Wylfa Newydd Development Area and surrounding buffer.

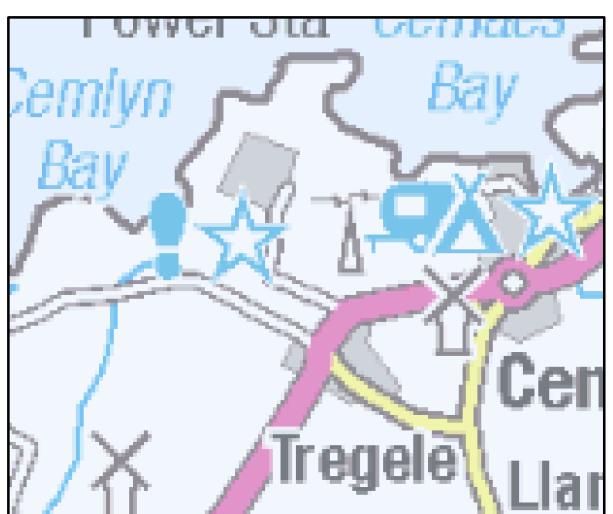
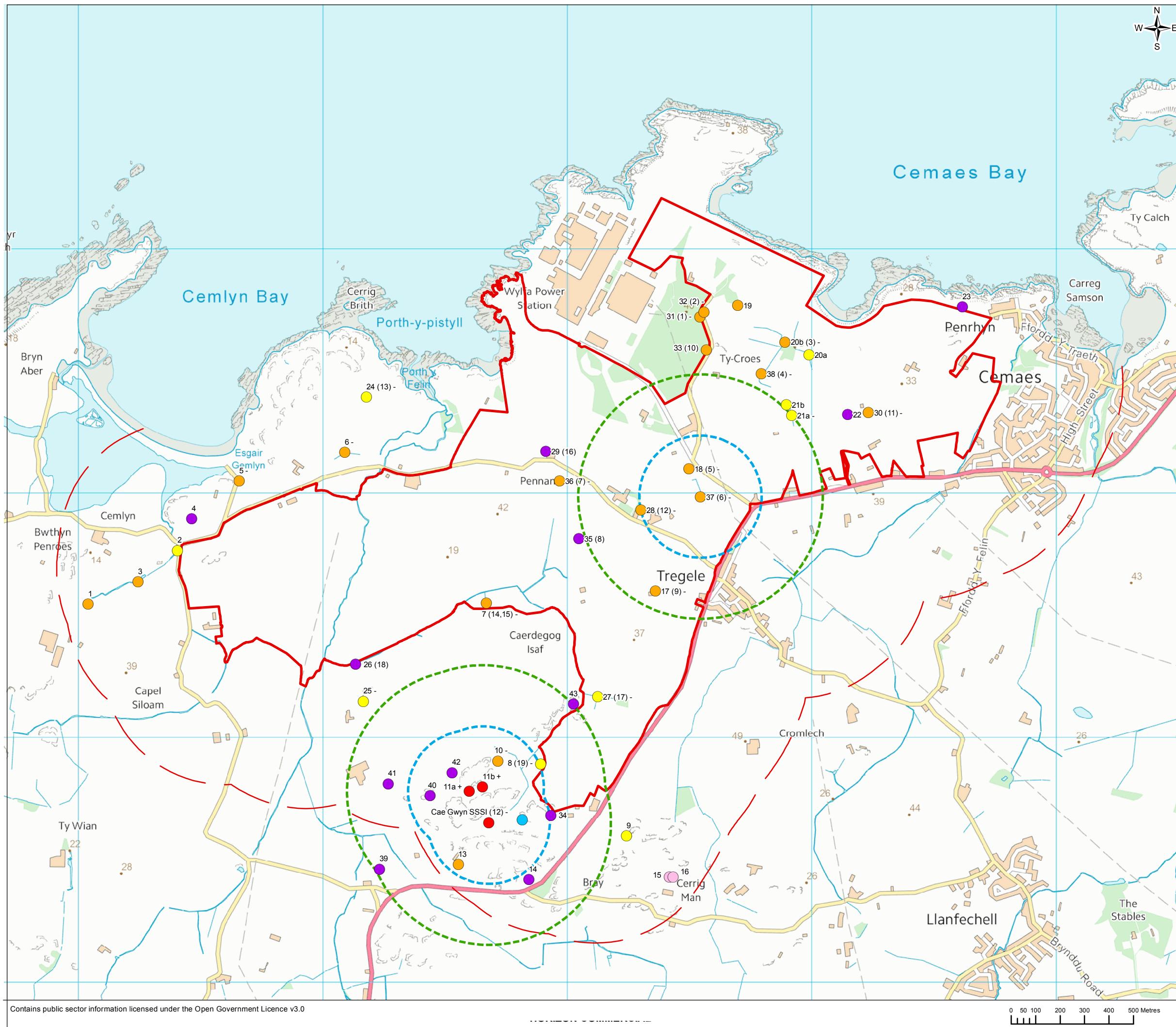
## 4. References

- Arup, (2013), *Amphibian Survey 2013*, unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd.
- Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F (2014) *Analytical and methodological development for improved surveillance of the Great Crested Newt*. Defra Project WC1067. Freshwater Habitats Trust: Oxford.
- Department of Energy and Climate Change. (2011). *National Policy Statement for Nuclear Power Generation (EN-6)*. The Stationery Office, London.
- English Nature, (2001), *Great crested newt mitigation guidelines*, English Nature.
- English Nature, (2004). An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt *Triturus cristatus*. Research Report No. 576.
- Froglife, (2001), *Surveying for (Great Crested) Newt Conservation*, Froglife Advice Sheet 11, Froglife, Halesworth.
- Jacobs, (2013a), *Consultancy Report: Baseline Phase 1 Habitat Survey Report 2013*, unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd. DCRM Ref. No. W202.01-S5-PAC-REP-00015.
- Jacobs, (2014), *Consultancy Report: Great Crested Newt Baseline Surveys 2014*, unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd. DCRM Ref. No. WN03.01.01-S5-PAC-REP-00007.
- Jacobs, (2015), *Technical Summary Report – National Vegetation Classification*, unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd. DCRM Ref No. WN034-JAC-PAC-REP-00003.
- Langton, T.E.S., Beckett, C.L., and Foster, J.P., (2001), *Great Crested Newt Conservation Handbook*, Froglife, Halesworth.
- Oldham R. S., Keeble J., Swan M.J.S. and Jeffcote M., (2000), Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*), *Herpetological Journal*, 10 (4), 135-155.

## Appendix A. Figures

Figure 1. Study area and survey result

FIGURE 1



0	MAY 17	Client review	FL	KL	NC	RB
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	App'r'd

JACOBS®

JACOBS  
Churchill House, Churchill Way, Cardiff, CF10 2HH  
T 02920 811111 F 02920 811111 E jacobscardiff@btconnect.com

**HORIZON**  
NUCLEAR POWER

LLEA NEWYDD PROPOSED NUCLEAR POWER STATION

---

#### GREAT CRESTED NEWT SURVEY - MOST RECENT RESULT FROM EACH POND

---

S  
1:15,000      (Inset 1:50,000)      DO NOT SCALE

60PO8058

---

2020 RELEASE UNDER E.O. 14176

is not to be used in whole or part other than for the intended purpose as defined on this drawing. Refer to the contract for full terms and conditions.

---

# **Site Preparation and Clearance**

## **Environmental Statement**

### **Volume 3 – Appendix 14-09**

### **Consultancy Report: Reptile Technical**

### **Summary Report**

---

[This page is intentionally blank]



## Wylfa Newydd

Horizon Nuclear Power (Wylfa) Ltd

### Reptile Technical Summary Report

60PO8032/TER/REP/005 | 1

WN034-JAC-PAC-REP-00007

#### Document history and status

Revision	Date	Description	By	Review	Approved
		Wylfa Technical Summary Report	Suzanne Jenkins	Dave Jones	
1	16/12/15	Minor changes following proof read	Suzanne Jenkins	Jonathan Jackson	Rob Bromley
2	05/06/17	Amendments following HNP review	Nick Clark	Jonathan Jackson	

#### Distribution of copies

Revision	Issue approved	Date issued	Issued to	Comments

## **Wylfa Newydd**

Project no: 60PO8032  
Document title: Reptile Technical Summary Report  
Document No.: 60PO8032/TER/REP/005  
Revision: 1  
Date: 16 December 2015  
Client name: Horizon Nuclear Power (Wylfa) Ltd  
Client no: WN034-JAC-PAC-REP-00007  
Project manager: Robert Bromley  
Author: Suzanne Jenkins  
File name: \\SOUFIL01\Projects\\$PROJECTS\\$B1496000 Wylfa Marine Services\6. Reports\Jacobs 2015 Technical Summary Reports\60PO8032 Wylfa Reptiles Technical Summary Report 2015 issued to RB 08 09 15.docx

Jacobs U.K. Limited

Kenneth Dibben House  
Enterprise Road, Southampton Science Park  
Chilworth, Southampton SO16 7NS  
United Kingdom  
T +44 (0)23 8011 1250  
F +44 (0)23 8011 1251  
[www.jacobs.com](http://www.jacobs.com)

© Copyright 2015 Jacobs U.K. Limited. The concepts and information contained in this document are the property of Jacobs. Use or copying of this document in whole or in part without the written permission of Jacobs constitutes an infringement of copyright.

Limitation: This report has been prepared on behalf of, and for the exclusive use of Jacobs' Client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

## Contents

<b>Executive Summary.....</b>	<b>1</b>
<b>1. Introduction.....</b>	<b>2</b>
1.1 Overview.....	2
1.2 Wylfa Newydd Project .....	2
1.3 Site Description .....	2
1.4 Report Aims and Objectives .....	3
1.5 Previous Work .....	3
1.6 Legal Status.....	3
<b>2. Methodology .....</b>	<b>4</b>
2.1 Survey Locations .....	4
2.2 Desktop Study .....	4
2.3 Survey Methodology.....	4
2.4 Limitations .....	4
<b>3. Results.....</b>	<b>5</b>
3.1 Background Data Search .....	5
3.2 Study Area Description and Field Survey Data.....	5
<b>4. Discussion .....</b>	<b>14</b>
<b>5. Conclusions .....</b>	<b>15</b>
<b>6. References .....</b>	<b>16</b>

### Appendix A. Figures

Appendix B. Background Data Search Results – Adder

Appendix C. Background Data Search Results – Common Lizards

Appendix D. Incidental Common Lizard Records

Appendix E. Incidental Adder Records

## Executive Summary

Horizon Nuclear Power Wylfa Ltd. (Horizon) is currently planning to develop a new nuclear power station on Anglesey (the Wylfa Newydd Generating Station) as identified in the National Policy Statement for Nuclear Power Generation (EN-6). The Wylfa Newydd Project (the Project) will require a number of applications to be made under different legislation to different regulators. Jacobs UK Ltd (Jacobs) was commissioned to collect baseline data to inform the various applications, assessments and permits that will be submitted for approval to construct and operate the Wylfa Newydd Generating Station.

This technical summary report provides a single resource for all of the survey and background data for reptiles within the Wylfa Newydd Development Area and from sites within a 500m buffer zone around the boundary; this is referred to as the 'study area' in this report. The data sources reviewed for this report include:

- previous reptile surveys carried out in 2010, 2011, 2013 and 2014;
- incidental reptile sightings; and
- records from a background data search.

The results of the reptile surveys showed that within 27 sites, there were three small populations of adders and nine small populations of common lizards. The results also suggest that grass snakes and slow worms are absent from the study area as no records of either species have been found as part of this study; it is therefore unlikely that either will be affected by the proposed development works.

Site 2 is east of the Existing Power Station and supported the highest number of adders with five recorded on one visit. Adders were also found at Site 4a and Site 7.

Common lizards were more widely distributed and were found at low population densities, with only one or two individuals generally being recorded on each visit. Sites with populations of common lizards were found from the southernmost Site 15 near Groes Fechan and Cae Gwyn Site of Special Scientific Interest (SSSI), and in most sites in the north-western corner of the study area.

The survey data was in agreement with the records of incidental sightings and those received from the local records centre in that low numbers of adders and common lizards were generally recorded, and there were no records of slow worms or grass snakes. The background data showed a focus in recording effort around Cemlyn Bay lagoon, which accounted for a higher number of records in this area.

The background data and incidental sighting records also showed that there is a high likelihood that there are low populations of adders and common lizards scattered throughout the study area and therefore a high probability of these species being found in unsurveyed areas of suitable habitat.

It is therefore recommended that adders and common lizards should be considered in any future environmental impact assessment for the site. Given the nature of their distribution it is also considered that by assessing the amount of suitable habitat present, an impact assessment can be made without the need for further surveys being undertaken. However, further survey would be required if there were significant changes in habitat management which could lead to any changes in the numbers or distribution of these species in the study area e.g. a cessation of grazing leading to significant increases in the amount of rank and tussocky grassland, a habitat that is favoured by reptiles.

## 1. Introduction

This report provides a technical summary of the data collected on reptiles within the Wylfa Newydd Development Area and from sites within a 500m buffer zone around the boundary of the Wylfa Newydd Development Area.

### 1.1 Overview

Horizon Nuclear Power Wylfa Ltd. (Horizon) is currently planning to develop a new nuclear power station on Anglesey as identified in the National Policy Statement for Nuclear Power Generation (EN-6). The Wylfa Newydd Project (the Project) comprises the proposed new nuclear power station (the Wylfa Newydd Generating Station), including the reactors, associated plant and ancillary structures and features, together with all of the development needed to support its delivery, such as highway improvements, worker accommodation and specialist training facilities. The Project will require a number of applications to be made under different legislation to different regulators. As a nationally significant infrastructure project under the Planning Act 2008, the construction and operation must be authorised by a development consent order.

Jacobs UK Ltd (Jacobs) was commissioned by Horizon to undertake a full ecological survey programme within the vicinity of the Power Station Site. This work has included the gathering of baseline data to inform the various applications, assessments and permits that will be submitted for approval to construct and operate the Power Station and Associated Development.

### 1.2 Wylfa Newydd Project

The Project includes the Wylfa Newydd Generating Station and Associated Development<sup>1</sup>. The Wylfa Newydd Generating Station includes two UK Advanced Boiling Water Reactors to be supplied by Hitachi-GE Nuclear Energy Ltd, associated plant and ancillary structures and features. In addition to the reactors, development on the Power Station Site (the indicative area of land and sea within which the majority of the permanent Wylfa Newydd Generating Station buildings, plant and structures would be situated) will include steam turbines, control and service buildings, operational plant, radioactive waste storage buildings, ancillary structures, offices and coastal developments. The coastal developments will include a Cooling Water System (CWS) and breakwater, and a Marine Off-Loading Facility (MOLF).

### 1.3 Site Description

The Wylfa Newydd Development Area (the indicative areas of land and sea, including the Power Station Site, the Wylfa NPS<sup>2</sup> Site and the surrounding areas that would be used for the construction and operation of the Wylfa Newydd Generating Station) covers an area of approximately 380ha. It is bounded to the north by the coast and the existing Magnox power station (the Existing Power Station). To the east, it is separated from Cemaes by a narrow corridor of agricultural land. The A5025 and residential properties define part of the south-east boundary, with a small parcel of land spanning the road to the north-east of Tregele. To the south and west, the Wylfa Newydd Development Area abuts agricultural land, and to the west it adjoins the coastal hinterland.

The Wylfa Newydd Development Area includes the headland south of Wylfa Head candidate Wildlife Site. There is one designated site for nature conservation within the Wylfa Newydd Development Area; Tre'r Gof Site of Special Scientific Interest (SSSI). It is also within 1km of the Cae Gwyn SSSI, Cemlyn Bay Special Area of Conservation (SAC) and SSSI, and the Ynys Feurig, the Skerries and Cemlyn Bay Special Protection Area (SPA).

<sup>1</sup> Development needed to support delivery of the Wylfa Newydd Generating Station is referred to as Associated Development. This includes highway improvements along the A5025, park and ride facilities for construction workers, Logistics Centre, Temporary Workers' Accommodation, specialist training facilities, Horizon's Visitor Centre and media briefing facilities.

<sup>2</sup> The site identified on Anglesey by the National Policy Statement for Energy EN-6/NPS EN-6 as potentially suitable for the deployment of a new nuclear power station.

Tre'r Gof is a small basin mire adjacent to the Existing Power Station, west of Cemaes. The area receives mineral-enriched waters from the surrounding boulder clay leading to the development of notable flora. It is the botanical interest that provides the reason for the designation of the site as a SSSI.

Cae Gwyn SSSI is located immediately to the south of the site to the west of Llanfechell. The site comprises two wetland areas separated by an outcrop of rock with heathland vegetation. The southern wetland is confined by a rock basin and is dominated by bogmoss *Sphagnum spp.* and a wide variety of common wetland herbs. The northern wetland has a different flora containing denser areas of willow *Salix spp.* and common reed *Phragmites communis*.

## 1.4 Report Aims and Objectives

This report is intended to provide a technical summary of the data collected on reptiles within the Wylfa Newydd Development Area plus a 500m buffer zone around its boundary. The Wylfa Newydd Development Area and 500m buffer zone combined are referred to as the 'study area' in this report (**Error! Reference source not found..**)

This report collates all data from previous surveys and background data searches and uses them to assess the distribution of reptiles throughout the study area.

## 1.5 Previous Work

The following reptile surveys have previously been carried out within the study area:

- reptile surveys were carried out by RSK as part of the decommissioning works at the Existing Power Station in 2008 (RSK, 2008);
- Arup conducted reptile surveys within the Wylfa Newydd Development Area in 2010 and 2011 (Arup, 2012a and Arup, 2012b);
- a baseline survey was carried out by Cambrian Ecological Partnership (CEP) in 2013 on behalf of Jacobs, this targeted all accessible land within the Wylfa Newydd Development Area (Jacobs, 2013a); and
- in 2014 Jacobs surveyed suitable areas of habitat within a 500m buffer of the Wylfa Newydd Development Area (Jacobs, 2014).

A background data search exercise was also completed by Jacobs in 2013. This included a request to Cofnod (North Wales Environmental Information Service) who provided a spreadsheet containing all plant and animal species records from within 2.5km of the study area (Cofnod, 2013). Additionally, Jacobs have been collecting records of non-target species recorded incidentally during other surveys. Both datasets were used in this report to inform an understanding of the study area.

## 1.6 Legal Status

All reptiles receive protection under the Wildlife and Countryside Act 1981 (as amended) making it illegal to intentionally injure or kill these animals.

In Wales, the adder (*Vipera berus*) is identified as a species of conservation concern in accordance with the provisions of 'Section 42' of the Natural Environment and Rural Communities Act 2006 (NERC). Under this legislation all 'Competent Authorities' have an obligation to give consideration to the species on this list in all of their activities, including planning issues.

## 2. Methodology

### 2.1 Survey Locations

The extent of the study area has evolved since the start of the reptile surveys in 2010. At the start of the survey programme the surveys generally only included the Wylfa Newydd Development Area, whereas the 2014 surveys included sites from within the 500m buffer zone. The reason for the extension to the study area was to provide more context to the results gathered within the Wylfa Newydd Development Area, and to provide information regarding the use of suitable habitat in the buffer zone as future potential mitigation for reptile populations potentially affected by the project.

Survey locations within the study area were selected based on their potential to support reptiles. This information was taken from previous surveys conducted in 2008 by RSK (RSK, 2008), and in subsequent years from Phase 1 Habitat Survey Reports (Walsh, 2009 and Jacobs, 2013b). Sites were then visited to confirm their suitability, and surveys were carried out using artificial refugia at selected sites.

The locations of survey sites are given in figure 6.1 and show that across four years of survey there have been 27 survey sites. These sites have been identified differently within each baseline report. Therefore in order to enable clear interpretation of the results, the sites have been re-numbered so they can be shown on a single figure and can be clearly described.

The survey site descriptions are given from the most up-to-date report which includes a survey from that area, with references given in each case.

### 2.2 Desktop Study

This report interrogated the spreadsheet from Cofnod (Cofnod, 2013) to determine how the field data compares to historical reptile data from the local area. Records were obtained from the Wylfa Newydd Development Area plus a 2.5km buffer surrounding this.

### 2.3 Survey Methodology

All reptile surveys involved a combination of visual checks of the survey site and the use of artificial refugia in areas of suitable habitat. While the precise methodology and field equipment used for artificial refugia surveys did vary between survey sites and survey years, a review of all previous data was made in 2013 to ensure that it was fit for purpose and had been collected in accordance with best practice guidelines (HGBI, 1998) and the Herpetofauna Workers' Handbook (Gent and Gibson, 2003).

In addition to reptile data collected during dedicated surveys, any incidental sightings made within the study area by field staff were also recorded.

### 2.4 Limitations

The limitations for each survey conducted were documented in each survey report, with the most common limitations being sub-optimal weather conditions, restricted land access and missing artificial refugia (moved/destroyed).

A full review of limitations has not been provided in this report. This is because it is considered that these limitations are unlikely to significantly alter the conclusions of this report. This is primarily due the quantity of data available from four years of survey data, coupled with background data from Cofnod and incidental sightings.

## 3. Results

### 3.1 Background Data Search

The background data search (Cofnod, 2013) returned records for both adders and common lizards (Appendix B and Appendix C). No records of any other reptile species were returned.

There were 50 adder records made between 1986 and 2012 inclusive (figure 6., Appendix A). The highest number of individuals recorded at any one sighting was seven, at Cemlyn lagoon in 1998. This number was particularly high, with one to three individuals being recorded at the majority of the other locations.

There were 63 common lizard records between 1983 and 2013 inclusive (figure 6., Appendix A). The majority of records were sightings of individual lizards. However, some of the records represent daily totals for an area and range from three to seven lizards. The highest count of lizards in any one day (seven) was recorded at Cemlyn lagoon in 2005.

A data search undertaken by Arup of information contained on the National Biodiversity Network Gateway database revealed the presence of common lizard, grass snake (*Natrix natrix*) and slow worm (*Anguis fragilis*) on Anglesey (Arup, 2012a). After consultation with the Countryside Council for Wales (CCW) Arup concluded that grass snakes appeared to be only present at very low density (Arup, 2012a).

### 3.2 Study Area Description and Field Survey Data

A total of 27 sites were surveyed for reptiles over four years (figure 6.). A summary of the results is presented in table 3.1 below. A description of each site and its potential to support reptiles is included in table 3.2; this information has been taken from the most recent visit to the site. Table 3.2 also shows the maximum species count for a site, which is the maximum number of individuals recorded during any of the site visits during the survey season. Where juveniles were found at a site this has been taken as an indication that reptiles are breeding there, and has been indicated in the 'Breeding Confirmed' column.

In addition to the survey data, any incidental sightings of reptiles made by field staff were recorded, the details of which can be seen in Appendix D and Appendix E. There were four incidental sightings of adders, with only one adult (male or female) recorded each time. There were also seven incidental records of common lizards with the number of individual lizards seen ranging from one to three. No incidental records of any other reptile species were made.

The following abbreviations are used in table 3.1 and table 3.2:

- Zv – Common lizard (*Zootoca vivipara*);
- Vb – Adder (*Vipera berus*);
- A – Adult (sex not determined);
- J – Juvenile (sex not determined);
- M – Male;
- F – Female; and
- “–” – Not surveyed.

Table 3.1 Summary of reptile survey results

<b>Species</b>	<b>Number of sites where species was recorded</b>	<b>Max. count on any one visit</b>		<b>Number of sites where breeding was confirmed</b>
		<b>Count</b>	<b>Site No.</b>	
Adder	3	3F; 2M	2	3
Common lizard	9	2A	16	1

Table 3.2 Habitat description and reptile records for each survey site

Site	Site/habitat description	Maximum species count				Breeding confirmed Yes (spp. code) / No
		2010	2011	2013	2014	
1	Site 1 was an area of grazed grassland dotted with stands of gorse <i>Ulex europaeus</i> and fringed on the southern and eastern boundaries with dense bramble <i>Rubus fruticosus</i> agg. Although adders were recorded on Site 1 during the decommissioning survey (RSK, 2008), the potential of this area to support a robust population of this species is limited by heavy grazing of the improved grassland which dominates the habitat. This grazing would be a limiting factor with regards to potential prey biomass. This area was however relatively open giving plenty of opportunities for basking and there was cover in the form of dense gorse in some areas combined with bramble on the eastern boundary. The stone wall on the northern boundary offered a safe location for hibernation and opportunities for basking.	No reptiles recorded	No reptiles recorded	-	-	No
1a	This area was relatively open giving plenty of opportunities for basking and there was cover in the form of dense gorse in some areas combined with bramble on the eastern boundary. The stone wall on the northern boundary offered a safe location for hibernation and opportunities for basking and it was in the vicinity of this wall that adders were recorded during previous surveys. Although adders were recorded on this site during the decommissioning survey (RSK, 2008), the potential of this area to support a robust population was thought to have been reduced by heavy grazing of the improved grassland, which limited the potential presence of prey species such as small mammals.	-	-	No reptiles recorded	-	No
2	This area was un-grazed, with good cover from bramble, gorse and sea buckthorn <i>Hippophae rhamnoides</i> and a south-facing aspect and rocky areas providing ideal basking opportunities, making this area optimal reptile habitat.	1 Vb A	1 Vb A	3 Vb F, 2 Vb M; 1 Zv F	-	Vb

Site	Site/habitat description	Maximum species count				Breeding confirmed Yes (spp. code) / No
		2010	2011	2013	2014	
3	Site 3 was the area surrounding the 'Manor Car Park' which was an open scrubby area dominated by bramble and cock's-foot <i>Dactylis glomerata</i> with numerous opportunities for basking and hunting. The car park was surrounded by stone walls which could potentially be used for hibernation. This habitat was suitable for adders, slow worms <sup>3</sup> and common lizards. Due to the close proximity of the wetland of the Tre'r Gof SSSI, there was also the potential for grass snakes <sup>4</sup> to be present.	No reptiles recorded	-	-	-	No
4	Site 4 was in the Wylfa Head candidate Wildlife Site, refugia were located in more open, sunny areas between the gorse and on the south-facing woodland edge. Site 4 was a combination of dense gorse with rocky outcrops and open areas for basking at the northern end of the site. This area was also ungrazed and represented optimal adder habitat. Towards the southern end, the site was dominated by broadleaved plantation with a coniferous stand to the west. These habitats could be described as sub-optimal although there was the potential for adders and slow worms <sup>3</sup> to be present on the woodland edges. The potential of this area to support reptiles will however progressively diminish as the trees increase in size, reducing ground temperatures and basking opportunities.	No reptiles recorded	No reptiles recorded	-	-	No
4a	Site 4a was in a nature reserve, the refugia were located in more open, sunny areas between the gorse and on the south-facing woodland edge.	-	-	1 Vb J	-	Vb
5	Site 5 included the surroundings of the sports field where the refugia were placed in sunny positions in rough grassland on the edge of the coniferous planting. Site 5 had a very open aspect giving ample opportunities for basking. The sports field in the centre of the site was closely mown and consequently limited in its potential to support reptiles which would also be susceptible to fatalities from machinery. The woodland edges and less intensively managed areas of grassland where the refugia were located did however have the potential to support a limited population of slow worms <sup>3</sup> .	No reptiles recorded	-	-	-	No

<sup>3</sup> This description is taken from 2010, before the evidence from background data searches and extensive surveys had proved likely absence of slow worm from the study area (see section 4).

<sup>4</sup> This description is also taken from 2010 before the likely absence of grass snakes from the study area had been established (see section 4).

Site	Site/habitat description	Maximum species count				Breeding confirmed Yes (spp. code) / No
		2010	2011	2013	2014	
6	Site 6 comprised two distinct habitats. The predominantly wetland area, dominated by soft rush <i>Juncus effusus</i> had the potential to support an amphibian population which would in turn provide prey for grass snakes <sup>4</sup> . The drier field to the west was dominated by cock's-foot and at the time of the planning of the 2010 survey was deemed to be potential slow worm habitat <sup>3</sup> . The removal of grazing and all active management from this area however resulted in a very dense growth of vegetation leaving very little opportunity for basking. This part of Site 6 was probably largely unsuitable for reptile occupation with the exception of areas immediately adjacent to the access track where vegetation was less dense.	No reptiles recorded	-	No reptiles recorded	-	No
7	Site 7 was an ungrazed, open location to the immediate south of the Visitor Centre in which adders were recorded during decommissioning surveys (RSK, 2008). This area was actively managed with periodic strimming of the grass which could have been an inhibiting factor with regards to constant adder occupation. Keeping the grass short would certainly reduce prey biomass and the use of machinery could also result in snake fatalities. This area was therefore considered sub-optimal reptile habitat.	No reptiles recorded	No reptiles recorded	2 Vb F	-	Vb
8	Site 8 was an area of increasing scrub and ruderal vegetation density opposite Tan yr Allt which had no active management. There were however open, sunny areas suitable for basking. During previous survey planning, Site 8 was deemed to be suitable reptile habitat, being a patchwork of scrub and rough grassland. The habitat however had no active management and had declined in suitability over time as habitat became overgrown. The area was therefore considered unsuitable to support reptiles and was not surveyed from 2013 onwards.	No reptiles recorded	-	-	-	No

Site	Site/habitat description	Maximum species count				Breeding confirmed Yes (spp. code) / No
		2010	2011	2013	2014	
9	Site 9 was in the field directly below Rhwng Dau Fynydd, and was originally considered potential slow worm <sup>3</sup> and grass snake <sup>4</sup> habitat being a combination of rough grass and wetland. However, the removal of all active management of the site throughout the summer months saw a rapid change in the habitat composition, with dense tussocks of cock's-foot developing in the drier areas of the field. The result of this growth was that basking opportunities were very limited making the habitat unsuitable to support reptiles. This area was therefore not surveyed from 2013 onwards.	No reptiles recorded	-	-	-	No
10	The habitat on Wylfa Head candidate Wildlife Site was a combination of grazed grassland and coastal heath with areas of dense bracken and gorse. The potential of the habitats on Wylfa Head to support a robust population of adders was limited by periodic heavy grazing. This grazing would be a limiting factor with regards to potential prey biomass. The area was however relatively open giving plenty of opportunities for basking and there was cover in the form of dense gorse and bracken. The stone wall on the southern boundary offered a location for hibernation.	-	No reptiles recorded	-	-	No
10a	A combination of grazed grassland and coastal heath with areas of dense bracken <i>Pteridium aquilinum</i> and gorse. This habitat extended in a narrow strip along the coast in an easterly direction. The potential to support a robust population of reptiles was limited by the introduction of a large number of cattle, which resulted in heavy grazing and disturbance rendering the habitat generally unsuitable for reptile occupation.	-	-	No reptiles recorded	-	No

Site	Site/habitat description	Maximum species count				Breeding confirmed Yes (spp. code) / No
		2010	2011	2013	2014	
11	This site was located near to Pen Carreg to the west of the study area. The habitats present included a wetland area to the north dominated by bogbean <i>Menyanthes trifoliata</i> and a field of cattle grazed pasture separated from the road to the south by a dry-stone wall. The eastern and western ends of the wetland were found to be higher and drier and dominated by willow <i>Salix</i> spp. woodland with occasional gorse patches. The refugia were placed in a single line strategically located in order to attract reptiles from all of the habitats present.	-	-	No reptiles recorded	1 Zv F	No
12	A mosaic of gorse scrub and heavily grazed coastal grassland. The potential to support a robust population of reptiles was limited by the introduction of a large number of cattle to Site 12 in August 2013, which resulted in heavy grazing and disturbance rendering the habitat generally unsuitable for reptile occupation. Refugia placed in this area were subject to trampling from cattle and were therefore removed after six visits.	-	-	No reptiles recorded	-	No
12a	A mosaic of gorse scrub and heavily grazed coastal grassland. The potential to support a robust population of reptiles was limited by the introduction of a large number of cattle, which resulted in heavy grazing and disturbance rendering the habitat generally unsuitable for reptile occupation.	-	-	1 Zv A	-	No
13	An area of gorse scrub and grazed pasture with a small wetland area behind Caerdegog Isaf. In this case the grazing was previously by horses but more recently a few sheep and alpaca had been present. Site 13 had limited potential to support reptiles, due to heavy grazing by a combination of sheep and alpacas.	-	-	No reptiles recorded	-	No
14	A patchwork of grazed agricultural land and gorse scrub at Mynydd Ithel. Site 14 had limited potential to support reptiles due to heavy grazing by horses.	-	-	No reptiles recorded	-	No

Site	Site/habitat description	Maximum species count				Breeding confirmed Yes (spp. code) / No
		2010	2011	2013	2014	
15	An additional area adjacent to the Cae Gwyn SSSI surveyed on a single occasion. The land included some unimproved and semi-improved areas, with occasional gorse scrub and rocky areas. This additional land adjacent to the Cae Gwyn SSSI was judged to offer excellent basking opportunities on rocky outcrops, along with good cover from gorse patches and scrub. The nearby SSSI also offered excellent amphibian, invertebrate and small mammal prey.	-	-	1 Zv A	-	No
16	This area was located to the south of Cemlyn Lagoon to the west of the study area. The habitats present comprised scrub on the edges of cattle grazed pasture dominated by bramble and gorse. The refugia were placed on the western edges of the field in the transitional pasture scrub habitats which are favoured by common lizards.	-	-	-	2 Zv A	No
17	This site was located to the south-east of the car park at Cemlyn Bay. The habitats present included a triangular shaped area of rough grassland dominated by cock's-foot and an area of gorse-dominated scrub located on higher ground further to the east.	-	-	-	1 Zv M	ZV
18	Site 18 comprised refugia placed either side of the track leading up to Felin Gafnan cottage. Common lizards had been seen incidentally during other surveys in this area throughout 2014. The lizards had been seen most frequently on the south-facing side of the wall that separates the track from the adjacent field. The habitats here comprised rough grassland dominated by false oat-grass <i>Arrhenatherum elatius</i> with frequent patches of bramble and rose scrub.	-	-	-	1 Zv A	No
19	This area was located to the south of Cestyll Mill and west of the small area of plantation woodland. Two lines of refugia were placed among the rocky outcrops in areas of thicker vegetation with the potential to support reptiles.	-	-	-	1 Zv F	No

Site	Site/habitat description	Maximum species count				Breeding confirmed Yes (spp. code) / No
		2010	2011	2013	2014	
20	This area was located to the south of Porth-y-felin and was surveyed using two lines of refuges placed in adjacent fields north of Felin Gafnan cottage. The refugia were placed around the edges of gorse and bracken-dominated patches of scrub. The refugia were placed in habitats that generally had south-facing aspects to increase their likelihood of use.	-	-	-	No reptiles recorded	No
21	This site was located to the east of the plantation that borders the road which leads to the car park at Wylfa Head candidate Wildlife Site. This is also near to the demolished property previously known as Ty Croes. The habitats present included rank grassland and gorse-dominated scrub along the boundaries of the cattle and sheep-grazed fields. The site was also connected to the Tre'r Gof SSSI by strips of habitat, including defunct hedges, wet ditches and dry stone walls.	-	-	-	No reptiles recorded	No
22	Site 22 included the western extremity of the Tre'r Gof SSSI. The habitats present in much of the SSSI had previously been described as being very wet and unlikely to support reptiles. This is due to the high water table preventing sheltering or hibernating by reptiles underground (Jacobs, 2013b). However, to the west of the SSSI the habitats were drier due to the elevated ground formed by defunct hedges and collapsed cloddiau (traditional stone-faced earth boundary banks). It is considered that these habitats could sustain reptile populations which would probably use the wetter areas for foraging alone. In addition other habitats present at this site included diverse rush and sedge-rich wet marsh and grassland-dominated areas transitional between pasture and willow wet woodland.	-	-	-	1 Zv F	No
23	A combination of grazed grassland and coastal heath with areas of dense bracken and gorse. This habitat extended in a narrow strip along the coast in an easterly direction. Although Site 23 had the potential to support reptiles, this was limited by the fragmented nature of the habitat. This site was bordered by sea and heavily grazed pasture.	-	-	No reptiles recorded	-	No

## 4. Discussion

The data from four years of reptile surveys and incidental sightings from within the study area show that adders and common lizards are sparsely distributed across the whole study area and that there is a moderate to high probability that they will be found in all areas of suitable habitat. The results also show that where they persist in this part of northern Anglesey, they do so in very small populations.

This broad summary of the data serves to substantiate the findings of the Jacobs 2014 reptile survey, which indicated that the reptile populations present across the study area were at risk of extinction due to their small size and scattered distribution. Small populations are much more vulnerable to stochastic extinction events making the reptile community within the survey area very fragile and potentially non-viable in the long term.

The background data search returned records of both adders and common lizards. The data was in agreement with the field survey data in that the number of individuals recorded at each sighting was generally low. The background data records were slightly skewed because the majority of the records were from around Cemlyn lagoon. This is part of a nature reserve with public access which probably accounts for the focus in recording effort here.

A full review of the literature pertaining to the population of reptiles on Anglesey has not been carried out as it does not form part of the scope of this report. It is also considered unlikely to provide further insight into the likely effects on the species group. This is because Anglesey is well within the normal geographical range of both adder and common lizard and so their presence is not unexpected in areas of suitable habitat. However, some context can be obtained from other survey data on Anglesey. Other surveys carried out by Jacobs on an Associated Development site near to Junction 4 of the A55 to the south, found that reptiles were completely absent (Jacobs, 2014b). This area is dominated by improved grassland fields, but does have rank grassland margins where populations of reptiles could be expected to persist. However, no reptiles were found, potentially indicating that areas more extensive than field margins alone are required to support viable populations of the species group. Tentatively this could suggest that the risk of reptiles being present in less suitable habitats in the study area could be somewhat reduced.

In summary, it is considered that the results from the four years of survey data and incidental sightings, when combined with the background data search, are sufficient to be able to inform an Environmental Impact Assessment for the Project. This would provide an analysis of all impacts and the mechanisms by which they can be avoided, reduced or compensated for. For the Project, the precise details of the likely mitigation measures have yet to be established. However, discussions with local landowners nearby have been started with a view to establishing receptor sites for displaced animals. The means of translocation are also in process of being determined as the details of the clearance and construction are released. This is likely to include a combination of ecological watching briefs in lower risk areas, and daily checks of refugia in higher risk locations. The goal of the mitigation strategy will ultimately aim to preserve viable populations of reptiles adjacent to the study area. Habitat connectivity will then be managed in such a way that as the new landscape develops and matures (as designed in the Project Landscape Environment Master Plan), reptiles will be able to quickly recolonise the green spaces within the Wylfa Newydd Development Area.

## 5. Conclusions

The primary conclusion of this work is that the combined evidence from all reptile surveys indicates that there is a high likelihood that adders and common lizards will be found wherever there is suitable habitat present across the study area. These species should therefore be considered as receptors likely to be affected by any development of the study area and appropriate mitigation should be implemented prior to any works taking place that might result in an offence under the legislation protecting reptiles.

Evidence of slow worms or grass snakes was not found as a part of this study, and they are therefore unlikely to be affected by the proposed development works. As such, mitigation or surveys specific to these species are not considered necessary.

The recommendations from this report are that further surveys of suitable habitat are unlikely to provide any further information likely to significantly alter the findings of an EIA for the Project and associated development. This is provided that there are no significant changes in land management within the study area. If changes in the management of significant areas of land likely to be affected by the proposed development results in the creation of additional habitats that are suitable for reptiles (e.g. increases in areas of tussocky rough grassland due to a cessation in grazing), then this assessment will need to be updated.

## **6. References**

Arup, (2012a), *Interim Report on Reptile Surveys 2010*, unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd.

Arup, (2012b), *Report on Reptile Surveys 2010 & 2011*, unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd.

Cofnod, (2013), Unpublished data search of all biological records within 2.5km of the centre of the NPS site provided to Jacobs, December 2013.

Gent, T. and Gibson, S., (2003), *Herpetofauna Workers manual*, JNCC: Peterborough.

HGBI, (1998), *Evaluating local mitigation/translocation/programmes: Maintaining best practise and lawful standards – HGBI Advisory notes for Amphibian and Reptile Groups (ARGSs)*, Herpetofauna Groups of Britain and Ireland.

Jacobs, (2013a), *Reptile Baseline Surveys Report 2013*, unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd., Ref. WN202.01-S5-PAC-REP-00022.

Jacobs, (2013b), *Consultancy Report: Baseline Phase 1 Habitat Survey Report 2013*, unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd., Ref. WN202.01-S5-PAC-REP-00015.

Jacobs, (2014a), *Reptile survey report 2014*, unpublished report on behalf of Horizon Nuclear Power (Wylfa Newydd) Ltd., Ref. WN03.01.01-S5-PAC-REP-00014.

Jacobs, (2014b), *Dalar Hir: Reptile Baseline Surveys report 2014*, unpublished report on behalf of Horizon Nuclear Power (Wylfa Newydd) Ltd. Ref. WN03.01.01-S5-PAC-REP-00005

RSK Carter Ecological Ltd., (2008), *Wylfa Power Station Part Two, Section 12: Ecology & Baseline Survey Results*, unpublished report on behalf of Magnox.

Walsh, J., (2009), *Phase 1 & Protected Species Survey*, Report on behalf of ARUP.

## **Appendix A. Figures**

This page has been left blank.

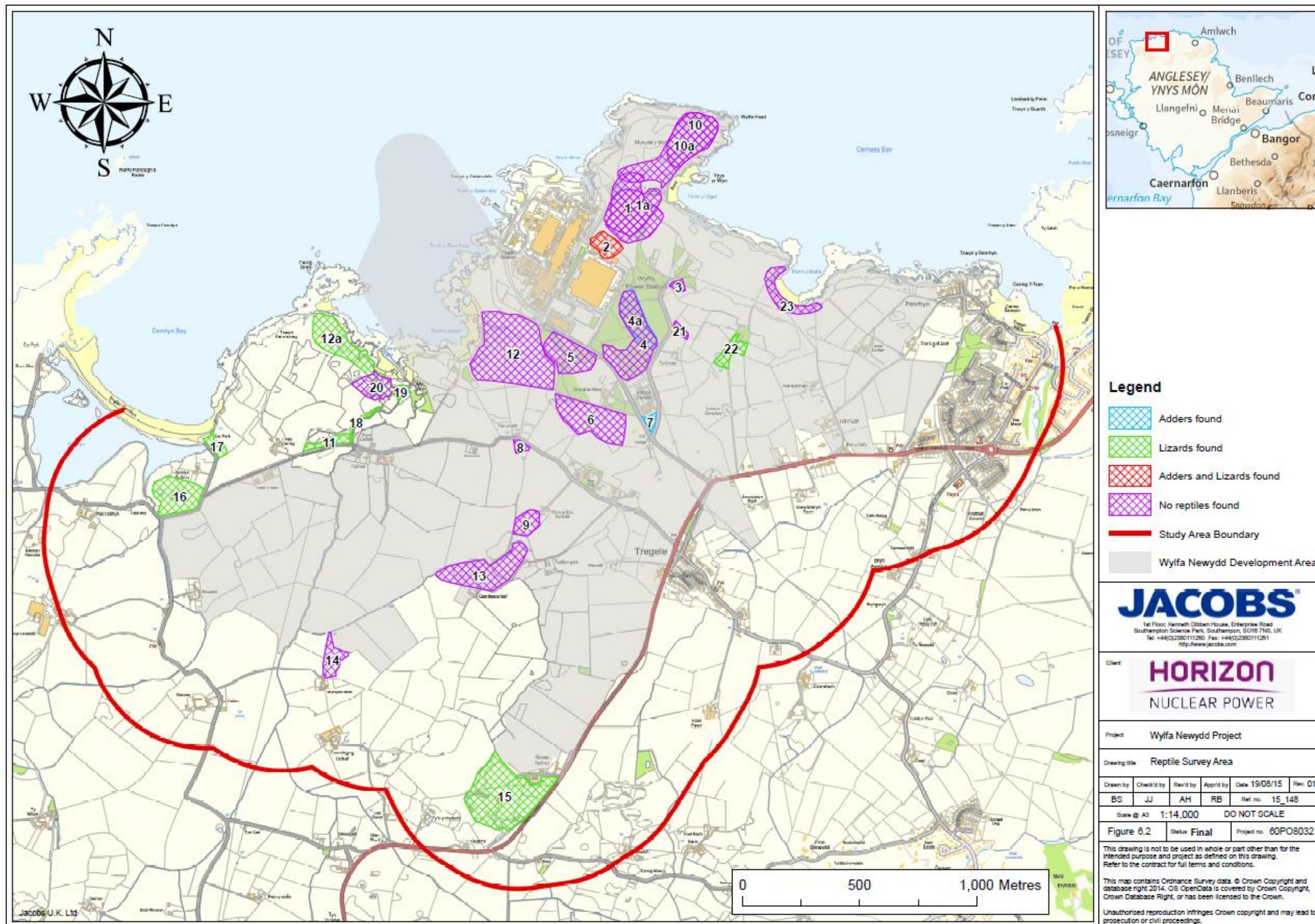


Figure 6.1 Map of the 27 survey locations showing where adders and common lizard were found



Figure 6.2 Map of the incidental and background data search records

## Appendix B. Background Data Search Results – Adder

Record no.	Location	Grid reference	Date	Description <sup>5</sup>	Max. count
1	Wylfa Power Station	SH353937	01/08/1986	Not recorded	Not recorded
2	Wylfa Power Station	SH353937	01/08/1986	Not recorded	Not recorded
3	Wylfa	SH353937	01/08/1986	Not recorded	Not recorded
4	Wylfa Power Station	SH353937	01/08/1986	Scrub	Female; Male
5	Cemlyn	SH3393	May 1994 – August 1994	At least two, perhaps three different individuals seen at least seven times along the old wall in Morfa.	2
6	Cemlyn	SH3393	19/05/1994	1 light, small; 1 dark, long. Seen coiled up together	2
7	Cemlyn	SH3393	20/06/1994	An entire sloughed skin was found.	Not recorded
8	Cemlyn	SH3393	04/05/1995	Seen along the old wall in Morfa (between c3 and c56).	1 Male
9	Cemlyn	SH3393	24/06/1995	Seen along the old wall in Morfa (between c3 and c56).	1
10	Cemlyn	SH3393	29/06/1995	Seen along the old wall in Morfa (between c3 and c56).	1
11	Cemlyn	SH3393	17/05/1996	On walled border between c3 and c56.	1
12	Cemlyn	SH3393	18/05/1996	On walled border between c3 and c56.	1 Male
13	Cemlyn	SH3393	14/05/1997	Slithered out of hole in the grass thatch in c42.	1
14	Cemlyn	SH3393	Spring 1998 – Summer 1998	Seen regularly on the stone wall through the middle of c3, up to 7 seen basking at a time. Present in the grassy tussocks in c3, a coil of 3 seen there in early May. Present in c42, with one coil of 3 and one individual seen on July 21st.	7

<sup>5</sup> References to compartment locations e.g. c3, c56 in the description column have not been used or referred to in this report as they are particular to the recorder of each submission to Cofnod.

<b>Record no.</b>	<b>Location</b>	<b>Grid reference</b>	<b>Date</b>	<b>Description<sup>5</sup></b>	<b>Max. count</b>
15	Cemlyn	SH3393	24/06/1999	The first adder seen. As we approached it moved below the stones in the stone wall in c3. A snake skin was also seen along the same wall; a couple of metres down.	1
16	Cemlyn	SH3393	30/06/1999	An adder of around half a metre in length in c3.	1
17	Cemlyn	SH330932	01/07/2002	There were no adder sightings this season, in spite of carrying out regular searches. However, a recently shed skin was on the road by Bryn Aber in late July.	0
18	Cemlyn	SH3393	2004	Seen basking in the sun on 5 occasions throughout the season, on the wall between the bridge and c3 and on another wall behind c3.	Not recorded
19	Cemlyn	SH3393	2006	Adders were seen on a regular basis basking on the low stone wall on the Bryn Aber side of the bridge (C3). Two females and a male were recorded at this site.	Not recorded
20	Cemlyn	SH3393	16/06/2007	Three were seen on the 16th June underneath one of the new tin sheets put into place this year in c3. These only represent a small corner of c3.	3
21	Cemlyn	SH3393	22/07/2007	The actual number could be a lot higher as five individuals were seen basking on the wall on the 22nd of July the highest count so far for the reserve.	5
22	Cemlyn	SH3393	2007	1 or 2 individuals were seen on the low wall next to the bridge in front of c3.	1 or 2
23	Cemlyn	SH330932	11/05/2008	One juvenile/young adult, found in lane near Tyn Llan turning. Road casualty.	1 Juvenile, dead
24	Cemlyn	SH330932	19/07/2008	Seen regularly under refugia and on the wall.	7
25	Cemlyn	SH3393	Before March 2009	Basking.	Not recorded

<b>Record no.</b>	<b>Location</b>	<b>Grid reference</b>	<b>Date</b>	<b>Description<sup>5</sup></b>	<b>Max. count</b>
26	Cemlyn	SH3393	2009	Not seen as regularly as last year possibly because May was very wet and it has been very hot during June. Seen more frequently during July. Mainly seen on the wall by the lay-by in front of C3.	Not recorded
27	Cemlyn	SH3393	02/05/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	1
28	Cemlyn	SH3393	03/05/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	1
29	Cemlyn	SH3393	05/05/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	1
30	Cemlyn	SH3393	17/05/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	1
31	Cemlyn	SH3393	18/05/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	1
32	Cemlyn	SH3393	19/05/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	1
33	Cemlyn	SH3393	20/05/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	1
34	Cemlyn	SH3393	29/06/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	2
35	Cemlyn	SH3393	02/07/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	1
36	Cemlyn	SH3393	03/07/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	1
37	Cemlyn	SH3393	04/07/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	1

<b>Record no.</b>	<b>Location</b>	<b>Grid reference</b>	<b>Date</b>	<b>Description<sup>5</sup></b>	<b>Max. count</b>
38	Cemlyn	SH3393	05/07/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	1
39	Cemlyn	SH3393	07/07/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	1
40	Cemlyn	SH3393	11/07/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	1
41	Cemlyn	SH3393	16/07/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	3
42	Cemlyn	SH3393	17/07/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	2
43	Cemlyn	SH3393	20/07/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	2
44	Cemlyn	SH3393	25/07/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	2
45	Cemlyn	SH3393	29/07/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	2
46	Cemlyn	SH3393	31/07/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	2
47	Cemlyn	SH3393	01/08/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	1
48	Cemlyn	SH3393	02/08/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	3
49	Cemlyn	SH3393	04/08/2010	Mainly seen on the wall by the lay-by in front of C3, with counts up to three daily.	1
50	Cemlyn – Compartment 21	SH3302093234	02/06/2012	Not recorded	1 Juvenile, dead

## Appendix C. Background Data Search Results – Common Lizards

Record no.	Location	Grid reference	Date	Description <sup>6</sup>	Max. count
1	Cemlyn Bay Reserve	SH328929	05/05/1983	Wet Grassland. 2km W Tregele.	Not recorded
2	Cemlyn NR	SH328929	05/05/1983	Data received via CCW.	Not recorded
3	Cemlyn Bay N.T.	SH328929	05/05/1983	Not recorded	Not recorded
4	Cemlyn	SH3393	1984	Occasionally seen.	Not recorded
5	SSSI: Cemlyn Bay	SH331934	Summer 1984	Occasionally seen.	Not recorded
6	Cemlyn – Compartment 532; Plas Cemlyn	SH331928	1986	Seen on road.	1
7	Cemlyn – Compartment 52; Trwyn	SH331938	05/06/1986	Not recorded	1
8	Wylfa Power Station	SH353937	01/08/86	Scrub.	Not recorded
9	Wylfa	SH353937	01/08/86	Data received via CCW.	Not recorded
10	Wylfa Power Station	SH353937	01/08/86	Not recorded	Not recorded
11	WYLFA POWER STATION	SH353937	01/08/86	Not recorded	Not recorded
12	Cemlyn	SH3393	18/06/1988	Seen by the old coal buildings.	1
13	Cemlyn; C540	SH3393	23/06/1988	Not recorded	1
14	Cemlyn (Compartment 13)	SH331932	Before September 1990	Phase 1 Habitat Code: H7.	Not recorded
15	Cemlyn	SH3393	02/05/1994	On roadside near C43.	1 Female
16	Cemlyn	SH3393	07/05/1994	Along roadside towards East car park.	3

<sup>6</sup> References to compartment locations e.g. c3, c56 in the description column have not been used or referred to in this report as they are particular to the recorder of each submission to Cofnod.

<b>Record no.</b>	<b>Location</b>	<b>Grid reference</b>	<b>Date</b>	<b>Description<sup>6</sup></b>	<b>Max. count</b>
17	Cemlyn	SH3393	09/05/1994	(1 young one) On roadside near C539.	2
18	Cemlyn; C3	SH3393	19/05/1994	Along old wall in Morfa.	1
19	Cemlyn	SH3393	26/05/1994	Young one on old wall, Morfa.	1
20	Cemlyn	SH3393	08/07/1994	On old wall, Morfa.	1 Male
21	Cemlyn; C41	SH3393	11/07/1994	Heavily pregnant. In long grass in C41.	1 Female
22	Cemlyn; C530	SH3393	12/07/1994	Among rocky outcrops.	1 Male
23	Cemlyn	SH3393	20/07/1994	On roadside towards East car park.	1 Female
24	Cemlyn	SH3393	04/05/1995	Seen basking on wall opposite Ty'n Sydney entrance.	1 Male
25	Cemlyn	SH3393	05/05/1995	Not recorded	4
26	Cemlyn	SH3393	26/06/1995	A dead squashed lizard was found on the road near the junction and section 43.	1
27	Cemlyn	SH3393	16/06/1996	1 road casualty near Bryn Aber.	1
28	Cemlyn	SH3393	16/06/1996	1 on road near c534.	1
29	Cemlyn	SH3393	14/07/1996	1 female next to road near c43.	1 Female
30	Cemlyn	SH3393	18/07/1996	1 next to Bryn Aber in c41.	1
31	Cemlyn	SH3393	04/06/1997	Crossing the road in c42.	1
32	Cemlyn	SH3393	12/07/1997	On the road beside c3.	1
33	Cemlyn	SH3393	Spring 1998 – Summer 1998	These were seen on most sunny days. The roadside hedgerow along c540 was a regular haunt; individuals were also seen in the roadside hedgerow bordering c532 and c534. One seen under the slates in the Coal Sheds (c77), and another seen on the clawdd wall.	Not recorded

<b>Record no.</b>	<b>Location</b>	<b>Grid reference</b>	<b>Date</b>	<b>Description<sup>6</sup></b>	<b>Max. count</b>
34	Cemlyn	SH3393	27/05/1999	Observed in the old stone wall in c3 adjacent to the lagoon inlet.	1
35	Cemlyn	SH3393	30/05/1999	In the stone wall situated in c3 adjacent to lagoon inlet.	1
36	Cemlyn	SH3393	12/06/1999	Seen in the wall of the road bridge traversing the lagoon inlet.	1
37	Cemlyn	SH330932	2002	One found dead on the road between Hen Blas and the Post Box.	1
38	Cemlyn	SH330932	19/06/2002	One was seen basking in c51 on 19th June.	1
39	Cemlyn	SH330932	2003	Only one dead common lizard was recorded this season.	1 dead
40	Cemlyn	SH3393	27/05/2004	Two sightings, one on the wall in c51 on the 27th of May.	1
41	Cemlyn	SH3393	29/07/2004	One in Bryn Aber garden on the 29th of July.	1
42	Cemlyn	SH3393	20/06/2005	One was seen on the road between c43 and c74 on 20th June.	1
43	Cemlyn	SH3393	08/07/2005	On the 8th July, 7 were observed basking around the reserve in c540, c541, c534, c3 and c529.	7
44	Cemlyn	SH3393	16/07/2005	On the 16th July, 3 were observed in c516 and c3.	3
45	Cemlyn	SH3393	28/04/2006	A dead Lizard was found on the bridge on the 28th of April.	1 dead
46	Cemlyn	SH3393	25/05/2006	Common lizards were recorded on hot sunny days on 8 occasions through the season, mostly on the stone walls around the reserve. A maximum of three were seen on the 25th May.	3

<b>Record no.</b>	<b>Location</b>	<b>Grid reference</b>	<b>Date</b>	<b>Description<sup>6</sup></b>	<b>Max. count</b>
47	Cemlyn	SH3393	2007	Common lizards were seen on 9 occasions in several different locations these were c43, c51, c63 and c532. All locations were either on rocks or walls that are in full sun.	Not recorded
48	Cemlyn	SH330932	01/05/2008	1 adult on Bryn Aber wall.	1 Adult
49	Cemlyn	SH330932	01/05/2008	1 juvenile in the lane near Bryn Aber doorway.	1 Juvenile
50	Cemlyn	SH3393	11/06/2009	An individual has been seen almost daily from 11th June on the wall by the lay-by in front of C3.	1 individual
51	Cemlyn; Near the Trwyn	SH3393	08/08/2010	Known to be present on the reserve but very hard to locate. One was seen sunning itself near the Trwyn.	1
52	Cemlyn	SH3393	20/06/2011	Not recorded	1
53	Cemlyn	SH3393	20/06/2011	Not recorded	1
54	Cemlyn	SH3393	30/06/2011	Not recorded	1
55	Cemlyn	SH3393	30/06/2011	Not recorded	1
56	Cemlyn; Plas Cemlyn	SH330928	01/07/2011	Dead on road	1 Dead
57	Cemlyn	SH3393	11/07/2011	Not recorded	1
58	Cemlyn	SH3393	11/07/2011	Not recorded	1
59	Cemlyn – Car Park (North)	SH3294393545	02/06/2012	Not recorded	1
60	Wylfa Power Station	SH3562993799	31/03/2013	Not recorded	1 Adult
61	Wylfa Power Station	SH3563493808	31/03/2013	Not recorded	1 Adult
62	Cemlyn	SH3393	02/05/2013	Not recorded	1
63	Cemlyn	SH3393	02/06/2013	Not recorded	1

## Appendix D. Incidental Common Lizard Records

Number	Location	Grid reference	Description	Date	Max. count
1	Above the boathouse	SH 35580 94141	Coastal scrub	2011	1 M
2	Behind the Existing Power Station	SH 35355 93908	On a bank	2011	1 F
3	Near the sewage plant	SH 35405 94248	Hunting near the dense gorse along the stone wall	2011	1 M
4	Nature trail	Not recorded	Basking on grass	15/04/2014	1
5	Coastal Path entrance near contractor's compound	Not recorded	Not recorded	12/05/2015	1 M dead

## Appendix E. Incidental Adder Records

Number	Location	Grid reference	Description	Date	Max. count
1	Private land	SH 34765 91661	Not recorded	01/07/2013	1
2	Private land	SH 34765 91661	Not recorded	01/07/2013	1
3	South of Cae Gwyn SSSI	SH 34856 91475	Not recorded	15/07/2013	1
4	Nature Trail	Not recorded	Basking on grass	15/05/2014	1
5	Track next to Felin Gafnan	Not recorded	Basking by wall	24/03/2014	1
6	East side of SSSI	Not recorded	2 x fallen into old fence-post hole, 1 x seen nearby.	22/04/2015	3

---

# **Site Preparation and Clearance**

## **Environmental Statement**

### **Volume 3 – Appendix 14-10**

### **Consultancy Report: Breeding Bird**

### **Technical Summary Report**

---

[This page is intentionally blank]



## Wylfa Newydd

Horizon Nuclear Power

### Technical Summary Report – Breeding Birds

60PO8032/TER/REP/003 | 2

WN034-JAC-PAC-REP-0005

#### Document history and status

Revision	Date	Description	By	Review	Approved
		Technical Summary – Breeding Birds	Laura Gore	Dave Jones	
1	16/12/15	Minor changes following proof read	Suzanne Jenkins	Jonathan Jackson	Rob Bromley
2	17/03/16	Minor changes following HNP IC comments	Laura Gore	Nick Clark	
3	05/06/17	Minor changes following HNP IC comments	Jonathan Jackson	Nick Clark	

#### Distribution of copies

Revision	Issue approved	Date issued	Issued to	Comments

## Wylfa Newydd

Project no: 60PO8032  
Document title: Technical Summary Report – Breeding Birds  
Document No.: 60PO8032/TER/REP/003  
Revision: 3  
Date: 5<sup>th</sup> June 2017  
Client name: Horizon Nuclear Power  
Client no: WN034-JAC-PAC-REP-0005  
Project manager: Robert Bromley  
Author: Laura Gore  
File name: P:\\$PROJECTS\\$B1496000 Wylfa Marine Services\6. Reports\Jacobs 2015 Technical Summary Reports\60PO8032 Wylfa Breeding Birds Technical Summary Report 2015 issued to RB\_after proof read.docx

Jacobs U.K. Limited

Churchill House  
Churchill Way  
Cardiff, CF10 2HH  
United Kingdom  
T +44 (0)29 2035 4200  
F +44 (0)29 2035 3222  
[www.jacobs.com](http://www.jacobs.com)

© Copyright 2015 Jacobs U.K. Limited. The concepts and information contained in this document are the property of Jacobs. Use or copying of this document in whole or in part without the written permission of Jacobs constitutes an infringement of copyright.

Limitation: This report has been prepared on behalf of, and for the exclusive use of Jacobs' Client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

## Contents

<b>Executive Summary.....</b>	<b>1</b>
<b>1. Introduction.....</b>	<b>3</b>
1.1 Overview.....	3
1.2 Wylfa Newydd Project .....	3
1.3 Site Description .....	3
1.4 Aims and Objectives.....	4
1.5 Summary of Work to Date .....	4
1.6 Legal Status.....	4
1.7 Conservation Status .....	5
1.8 Notable Species .....	7
<b>2. Methodology .....</b>	<b>8</b>
2.1 Desk Survey .....	8
2.2 Field Survey.....	8
2.3 Limitations .....	10
<b>3. Results.....</b>	<b>11</b>
3.1 Desk Study .....	11
3.2 Field Survey.....	12
<b>4. Discussion and Conclusions .....</b>	<b>16</b>
4.1 Habitats .....	16
4.2 Breeding Species .....	16
4.3 Notable Breeding Species .....	17
4.4 Conclusions .....	18
<b>5. References .....</b>	<b>19</b>

## Figures

<b>Appendix A. Cofnod Data .....</b>	<b>29</b>
<b>Appendix B. Target Species Surveys – Additional Results .....</b>	<b>48</b>
<b>Appendix C. Combined Results – Summary.....</b>	<b>50</b>

## Executive Summary

This technical summary report provides a single resource regarding all survey and background data available for breeding bird species in the study area. The study area comprises the Wylfa Newydd Development Area and the surrounding 500 m. Breeding bird surveys of the study area have taken place in consecutive years between 2010 and 2014. Barn owl (*Tyto alba*) are discussed in a separate report.

Data gathering has included a review of:

- desk/background information;
- walked transect surveys;
- target species surveys; and
- incidental sightings.

The study area provides a wide variety of breeding and foraging habitat that supports a diverse bird population. Whilst a large proportion of the species recorded during the surveys were generally considered to be common and widespread, certain habitats provided nesting and foraging resources for notable species (i.e. species that are afforded special protection or are of conservation concern).

A total of 104 bird species were recorded in the study area during the breeding bird surveys, which included 53 notable species.

Twelve species are listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and 11 species are listed under Annex I of the Directive on the Conservation of Wild Birds 79/409/EEC (the Birds Directive).

Twenty-one Species of Principal Importance in Wales in accordance with the requirements of Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006, along with five Local Biodiversity Action Plan (LBAP) species (Anglesey, undated).

Seventeen species are included on the Red List and thirty species are on the Amber List of Birds of Conservation Concern (Eaton et al, 2015).

Thirty-one of the 53 notable species recorded in the study area were confirmed as breeding, with three probable and seven possible breeding species. Thirteen notable species were assessed as not breeding within the study area.

In addition to the species recorded during the breeding bird surveys, there is evidence of a further seven notable species of bird having been recorded between 2010 and 2015. These included records of calling corncrake, cuckoo and Manx shearwaters, and sightings of osprey, short-eared owl and hen harrier. None of these species have ever been recorded with any regularity, suggesting that none breed in the study area, or are resident for any period of time. It is unsurprising that additional notable species are occasionally recorded within a study area that is as large as that of the Project, and that has been studied so intensively for five years. These sightings are therefore considered to be insignificant in the context of determining the value and significance of breeding birds in the study area.

The most important habitats within the study area that provided resources for local populations of breeding species were those that were less intensively managed. These included:

- woodland and scrub/hedgerows;
- grassland (semi-improved and coastal areas in particular);
- marsh/marshy grassland;
- coastal heath/grassland mosaic;
- maritime hard cliff and crevice and ledge vegetation mosaic; and

- built-up areas.

The compiled species list of breeding birds from all five years' survey data is not considered to be exceptional for a site as large and complex as the study area. Although the study area gives a level of conservation importance of 'regional' significance (70+ species) using guidance by Fuller (1980), the surveys have been repeated over multiple years over a large site and a local importance valuation is considered to be more appropriate.

## 1. Introduction

This report provides a technical summary of the data collected on species of breeding birds within the Wylfa Newydd Development Area and within a 500m buffer zone around the boundary of the Wylfa Newydd Development Area.

### 1.1 Overview

Horizon Nuclear Power Wylfa Ltd. (Horizon) is currently planning to develop a new nuclear power station on Anglesey as identified in the National Policy Statement for Nuclear Power Generation (EN-6). The Wylfa Newydd Project (the Project) comprises the proposed new nuclear power station (the Wylfa Newydd Generating Station), including the reactors, associated plant and ancillary structures and features, together with all of the development needed to support its delivery, such as highway improvements, worker accommodation and specialist training facilities. The Project will require a number of applications to be made under different legislation to different regulators. As a nationally significant infrastructure project under the Planning Act 2008, the construction and operation must be authorised by a development consent order.

Jacobs UK Ltd (Jacobs) was commissioned by Horizon to undertake a full ecological survey programme within the vicinity of the Power Station Site. This work has included the gathering of baseline data to inform the various applications, assessments and permits that will be submitted for approval to construct and operate the Power Station and Associated Development.

### 1.2 Wylfa Newydd Project

The Project includes the Wylfa Newydd Generating Station and Associated Development<sup>1</sup>. The Wylfa Newydd Generating Station includes two UK Advanced Boiling Water Reactors to be supplied by Hitachi-GE Nuclear Energy Ltd, associated plant and ancillary structures and features. In addition to the reactors, development on the Power Station Site (the indicative area of land and sea within which the majority of the permanent Wylfa Newydd Generating Station buildings, plant and structures would be situated) will include steam turbines, control and service buildings, operational plant, radioactive waste storage buildings, ancillary structures, offices and coastal developments. The coastal developments will include a Cooling Water System (CWS) and breakwater, and a Marine Off-Loading Facility (MOLF).

### 1.3 Site Description

The Wylfa Newydd Development Area (the indicative areas of land and sea, including the Power Station Site, the Wylfa NPS<sup>2</sup> Site and the surrounding areas that would be used for the construction and operation of the Wylfa Newydd Generating Station) covers an area of approximately 380ha. It is bounded to the north by the coast and the existing Magnox power station (the Existing Power Station). To the east, it is separated from Cemaes by a narrow corridor of agricultural land. The A5025 and residential properties define part of the south-east boundary, with a small parcel of land spanning the road to the north-east of Tregele. To the south and west, the Wylfa Newydd Development Area abuts agricultural land, and to the west it adjoins the coastal hinterland.

The Wylfa Newydd Development Area includes the headland south of Wylfa Head candidate Wildlife Site. There is one designated site for nature conservation within the Wylfa Newydd Development Area; Tre'r Gof Site of Special Scientific Interest (SSSI). It is also within 1km of the Cae Gwyn SSSI, Cemlyn Bay Special Area of Conservation (SAC) and SSSI, and the Ynys Feurig, the Skerries and Cemlyn Bay Special Protection Area (SPA).

<sup>1</sup> Development needed to support delivery of the Wylfa Newydd Generating Station is referred to as Associated Development. This includes highway improvements along the A5025, park and ride facilities for construction workers, Logistics Centre, Temporary Workers' Accommodation, specialist training facilities, Horizon's Visitor Centre and media briefing facilities.

<sup>2</sup> The site identified on Anglesey by the National Policy Statement for Energy EN-6/NPS EN-6 as potentially suitable for the deployment of a new nuclear power station.

Tre'r Gof is a small basin mire adjacent to the Existing Power Station, west of Cemaes. The area receives mineral-enriched waters from the surrounding boulder clay leading to the development of notable flora. It is the botanical interest that provides the reason for the designation of the site as a SSSI.

Cae Gwyn SSSI is located immediately to the south of the site to the west of Llanfechell. The site comprises two wetland areas separated by an outcrop of rock with heathland vegetation. The southern wetland is confined by a rock basin and is dominated by bogmoss (*Sphagnum* spp.) and a wide variety of common wetland herbs. The northern wetland has a different flora containing denser areas of willow (*Salix* spp.) and common reed (*Phragmites communis*).

## **1.4 Aims and Objectives**

The purpose of this technical summary is to provide a single resource regarding all survey and background data available for breeding bird species present to inform and support the Ecological Chapter of the Environmental Impact Assessment (EIA) for development of the Wylfa Newydd Generating Station.

The specific aims of the surveys completed were to:

- identify all species present and identify breeding status;
- determine the most valuable habitats for breeding birds; and
- determine the value/sensitivity of the breeding bird assemblage of the study area.

Together, these will provide a robust baseline of breeding bird data to enable a future impact assessment to be made, and appropriate mitigation to be designed to limit the impact on breeding birds. N.B. Barn owl is discussed in a separate report (Jacobs, 2015).

## **1.5 Summary of Work to Date**

A variety of bird surveys (breeding, over-wintering and marine) in the study area have taken place in consecutive years between 2010 and 2014. Specific breeding bird surveys were undertaken during:

- March to May 2010 and March to May 2011 (Arup, 2012);
- April to June 2012 (Arup, 2013);
- April to July 2013 (Jacobs, 2014); and
- April to July 2014 (Jacobs, 2014a).

In addition, a desk study has been undertaken which includes a review of biological records for the study area, including a 2.5km buffer.

## **1.6 Legal Status**

Birds are protected by national and international legislation that is summarised below.

### **1.6.1 International Legislation**

Many resident, breeding and migratory bird populations within the UK are protected under the following European legislation.

- The Wild Birds Directive 2009/147/EC (as amended) identifies and classifies SPAs for rare or vulnerable species, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance as listed in Annex I of the Directive.
- Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, otherwise known as the 'Habitats Directive', was adopted in 1992. The directive is the means by which the European Union meets its obligations under the Bern Convention and highlights a legal obligation to protect over 500 wild plants and over 1000 wild animal species. The directive is implemented in UK legislation through the Wildlife and Countryside Act 1981 (as amended).

- The Bonn Convention on Conservation of Migratory Species of Wild Animals 1979 aims to achieve effective management of migratory species across national or jurisdictional boundaries. This is implemented in UK legislation by the Wildlife and Countryside Act 1981 (as amended).

### 1.6.2 National Legislation

The Wildlife and Countryside Act 1981 (as amended) is the principal mechanism for the legislative protection of wildlife in Great Britain.

All bird species are protected under Section 1 of the Wildlife and Countryside Act (as amended) which prohibits:

- intentionally injuring, killing and taking any wild bird species; and
- intentionally taking, damaging or destroying eggs or nests (that are in use or being built) of any wild bird species.

Some species listed on Schedule 1 of the Act are afforded additional protection which makes it an offence to intentionally or recklessly disturb these birds or their dependent young while they are building a nest or are on, in or near a nest containing eggs or young.

The NERC Act 2006 places a statutory duty on public bodies to take, or promote the taking by others, of steps to further the conservation of the listed habitats and species. In Wales, this is sanctioned by Section 42 which orders the lists of habitats and species of principal importance. These are material considerations in the planning process. There are currently 51 bird Species of Principal Importance in Wales listed in accordance with the requirements of Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006.

## 1.7 Conservation Status

There are two mechanisms by which the relative conservation status of birds are categorised in the UK. These are the Birds of Conservation Concern classification devised by the Joint Nature Conservation Committee (JNCC) and Biodiversity Action Plans (BAPs). These are discussed below and referenced where relevant in this report.

### 1.7.1 Birds of Conservation Concern (BoCC)

In 1996, the UK's leading non-governmental bird conservation organisations, headed by the Royal Society for the Protection of Birds (RSPB), reviewed the status of all bird species regularly found in Britain. On the basis of several criteria relating to population status and relative importance to global conservation, each species was placed on one of three lists - 'Red' (highest conservation concern), 'Amber' (medium conservation concern) and 'Green' (lowest conservation concern) (Eaton *et al.*, 2015). The criteria for the Red and Amber lists are as follows:

Red list

- **International Union for Conservation of Nature (IUCN) Global Conservation Status** – species listed by BirdLife International as being Globally Threatened using IUCN criteria.
- **Historical Decline** – a severe decline in the UK between 1800 and 1995, without substantial recent recover.
- **Breeding Population Decline** – severe decline in the UK breeding population size, of more than 50% over 25 years or the entire period used for assessments since the first BoCC review, starting in 1969 ("longer-term").
- **Non-breeding Population Decline** – severe decline in the UK non-breeding population size, of more than 50%, over 25 years or the longer term.
- **Breeding Range Decline** – severe decline in the UK range, of more than 50%, as measured by number of 10km squares occupied by breeding birds, over 25 years or the longer term.

## Amber list

- **SPEC European Conservation status** – categorised as a Species of European Conservation Concern (SPEC 1, 2 or 3).
- **Historical Decline** – recovery. Listed in the IUCN Red List of Threatened Species (“Red List” or “Red Listed”) for Historical Decline in a previous review but with substantial recent recovery (more than doubled in the last 25 years).
- **Breeding Population Decline** – as for Red List criteria, but with moderate decline (by more than 25% but less than 50%).
- **Non-breeding Population Decline** – as for Red List criteria, but with moderate decline (by more than 25% but less than 50%).
- **Breeding Range Decline** – as for Red List criteria, but with moderate decline (by more than 25% but less than 50%).
- **Rarity** – UK breeding population of less than 300 pairs, or non-breeding population of less than 900 individuals.
- **Localisation** – at least 50% of the UK breeding or non-breeding population found in 10 or fewer sites.
- **International Importance** – at least 20% of the European breeding or non-breeding population found in the UK.

The lists are reviewed every five years and are used to inform the BAP process and other conservation policy decisions.

### 1.7.2 UK Post-2010 Biodiversity Framework

The UK Biodiversity Action Plan (UK BAP), published in 1994, was the UK's response to the commitments of the Rio Convention on Biological Diversity (1992). The plan outlined action for 59 species of birds of conservation importance/concern (JNCC, 2013). This has since been replaced by the UK Post-2010 Biodiversity Framework. This framework covers the period 2011 to 2020 and forms the UK Government's response to the new strategic plan of the United Nations Convention on Biodiversity (CBD) published in 2010. The UK BAP partnership therefore no longer operates, with the framework that replaces it promoting a focus on individual countries delivering targets for protection for biodiversity through their own strategies.

In Wales the strategy that has been adopted has transferred the species and habitats listed under the defunct UK BAP to Species of Principal Importance in Wales listed in accordance with the requirements of Section 42 of the NERC Act (2006) (see section 1.6.2). However, many of the tools and resources originally developed under the UK BAP still remain of use. Background information on UK BAP priority habitats and species form the basis of county level biodiversity protection initiatives such as Local Biodiversity Action Plans (LBAP). Anglesey currently has LBAPs for seven bird species:

- barn owl (*Tyto alba*);
- bittern (*Botaurus stellaris*);
- chough (*Pyrrhocorax pyrrhocorax*);
- corncrake (*Crex crex*);
- grey partridge (*Perdix perdix*);
- skylark (*Alauda arvensis*); and
- song thrush (*Turdus philomelos*).

## 1.8 Notable Species

Reference to “notable” species is made in this report. Notable species are those that are afforded special protection under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) or are of conservation concern, as listed in section 1.7 above.

Notable species have been further classified into three separate groups reflecting their degree of conservation importance, as per Cofnod guidance. This is summarised in table 1.1.

**Table 1.1: Notable Species - Definitions**

	<b>Notable</b>	<b>Category 1</b>	<b>Category 2</b>	<b>Category 3</b>
Legal Protection – International (Set up of designated sites – not strict protection of the individual)	■	■	-	-
Legal Protection – National (Wildlife and Countryside Act, 1981 (as amended))	■	■	-	-
Annex I (Directive on the Conservation of Wild Birds 79/409/EEC)	■	-	-	-
Species of Principal Importance in Wales	■	■	-	-
Red List (BoCC)	■	-	■	-
Amber List (BoCC)	■	-	■	-
Local Biodiversity Action Plan Species (not listed elsewhere)	■	-	-	■

## 2. Methodology

Four sources of data have been used to establish the presence of breeding bird populations within the study area. The data sources are provided in table 2.1.

**Table 2.1: Sources of Data**

Data Source	2010	2011	2012	2013	2014
Desk/background information (including Cofnod data)	■	-	-	■	-
Walked transect surveys	■	■	■	■	■
Target species surveys	-	-	■	■	■
Incidental sightings	-	-	-	■	■

### 2.1 Desk Survey

A background data search was requested from Cofnod in order to inform this study. The information requested included all legally protected and notable species records within 2.5km of the study area. This data was then analysed and mapped. A desk study was also undertaken to identify any nature conservation sites specifically designated for bird species within 2.5km of the study area.

### 2.2 Field Survey

#### 2.2.1 Transects

Transect surveys were undertaken between 2010 and 2014 with increasing frequency through the years: two transects were walked in 2010, four transects were walked 2011 and 2012 with six transects in 2013 and 2014. The methodology followed that described in Bibby *et al.*, (2000) and Gilbert *et al.* (1998).

The transects were designed to give good views of all fields, hedgerows, scrub, woodland, coastal heath and grassland, waterbodies/courses and, where possible, cliffs present in the study area. Each transect was surveyed once per month between April and July (with variance as listed in section 1.5) during weather conditions favourable for bird activity. This included avoiding periods of persistent or heavy rain, high wind or fog, as birds tend to be less active and therefore less visible during such conditions.

Each transect was walked at a constant pace and all species of birds observed within and considered to be using the study area were recorded. Particular attention was paid ahead of the observer to ensure, where possible, that birds were recorded before they were flushed. Surveyors stopped periodically at certain locations to listen for calls and observe any behaviour. Larger tracts of open land were also scanned from higher vantage points in order to accurately record numbers of large assemblages of birds, such as waders and wildfowl, before being flushed. The species, location, number and behaviour of all birds considered to be using the site were recorded. Birds observed flying directly overhead and through the study area, e.g. commuting or migrating, were not recorded.

#### 2.2.2 Target Species Surveys

Additional surveys were undertaken in order to obtain further information on the distribution and breeding status of certain target species. These species are either listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) or are 'notable', as defined in section 1.8. where:

- observed breeding behaviour is considered to be difficult due to nest locations or timing of courtship displays e.g. goshawk or woodcock;
- habitat use by certain species is restricted to certain types e.g. crossbill or chough;
- species are particularly sensitive to disturbance or development activities; or

- rarely recorded in the study area.

Surveys comprised small transects, following the methodology as discussed above, or “vantage point” surveys which involved surveyors remaining in one location and recording all birds within 250m. Each vantage point was surveyed for one hour before sunrise until two hours after and for a second period of one hour before sunset and one hour after.

The target species comprised raptors, owls, waders, herons and certain passerines, which comprised:

- buzzard (*Buteo buteo*);
- chough;
- common crossbill (*Loxia curvirostra*);
- goshawk (*Accipiter gentilis*);
- grey heron (*Ardea cinerea*);
- kestrel (*Falco tinnunculus*);
- little egret (*Egretta garzetta*);
- merlin (*Falco columbarius*);
- peregrine (*Falco peregrinus*);
- short-eared owl (*Asio flammeus*);
- snipe (*Gallinago gallinago*);
- sparrowhawk (*Accipiter nisus*); and
- woodcock (*Scolopax rusticola*).

In 2012 numerous undefined vantage points were surveyed (Arup, 2013). In 2013 seven distinct vantage points were surveyed (Jacobs, 2014) while in 2014 the target species survey comprised two additional transects, four vantage point surveys covering two separate areas and a survey of the heron colony at the conifer plantation woodland to the south of the Existing Power Station (Jacobs, 2014a).

### **2.2.3 Incidental Records**

Incidental records were made of additional notable bird species seen during target species surveys and other ecology surveys carried out in the breeding bird season.

### **2.2.4 Criteria for Assessment of Breeding Status**

The breeding status for each bird species recorded within the study area was assessed. A set of criteria was devised for this assessment using evidence gathered during the surveys and based on those given in the Bird Atlas 2007-2011 (BTO, 2013), summarised below in table 2.2.

**Table 2.2: Breeding Status Criteria (amended from BTO, 2013)**

<b>Confirmed Breeder (CB)</b>	<b>Probable Breeder (PB)</b>	<b>Possible Breeder (PsB)</b>	<b>Non-Breeder (NB)</b>
Distraction display	Pair in suitable nesting habitat in breeding season	Observed in suitable nesting habitat in breeding season	Migrant/Flying over
Used nest or eggshells found from this season	Permanent territory – an individual bird in the same area or close to it, over two or more survey visits	Singing male in breeding season in suitable breeding habitat.	Over summering
Recently fledged young or downy young	Courtship and display	-	Observed in unsuitable nesting habitat

<b>Confirmed Breeder (CB)</b>	<b>Probable Breeder (PB)</b>	<b>Possible Breeder (PsB)</b>	<b>Non-Breeder (NB)</b>
Adults seen entering or leaving nest-site indicating occupied nest	Visiting probable nest site	-	-
Adults carrying faecal sac or food for young	Agitated behaviour	-	-
Nest containing eggs	Brood patch of incubating bird	-	-
Nest with young seen or heard	Nest building or excavating	-	-

## 2.2.5 Assessment of value of the breeding bird assemblage within the study area

The method used for assessment of the value of the assemblage of breeding birds that the study area supports was to compare the total number of breeding species to the values produced by Fuller (1980). The values produced by Fuller (1980) determine four levels of species richness according to the following numbers of confirmed breeding species:

- 1) Local = 25-49 species.
- 2) County = 50-69 species.
- 3) Regional = 70-84 species.
- 4) National = 85+ species.

The limitations of this approach are described below.

## 2.3 Limitations

The breeding bird survey methodology as given in Bibby *et al.* (2000) and Gilbert *et al.* (1998) is designed to give estimates of bird density across a landscape by sampling bird communities. It is not intended for accurately mapping the total number of birds or individual territories within a given area. However, the aim of the report is to provide a quantitative summary of breeding bird presence and so this is not considered a limitation.

Access was not granted for certain farms within the study area at the time of some surveys. These areas were surveyed from adjacent areas where possible. The habitats within these farms were also present in areas that were surveyed and therefore it is unlikely that additional species not recorded during surveys were present on these farms.

Survey and sampling methods were not consistent each year preventing accurate direct comparisons between the years. However, all habitat types in the study area were surveyed at some point and combining the results from five years of data has enabled robust conclusions to be drawn.

Assessment of the value of the assemblage of breeding birds by direct comparison to Fuller (1980) has a number of limitations. Primarily this is due to the figures for breeding species being dependant on the survey effort that is completed for any given site. In this instance surveys during the breeding season have been completed over five separate breeding seasons, when two is often the maximum number of seasons in which surveys are completed for environmental impact assessment. The size of the site is also a factor. This can influence the results as the likelihood of vagrants occurring in a given area increase proportionate to the area of land a site covers. However, the use of this comparison is considered valuable for determining the basis for future assessment, albeit in a limited way.

## 3. Results

### 3.1 Desk Study

#### 3.1.1 Designated Sites

The Ynys Feurig, Cemlyn Bay and The Skerries SPA (incorporating Cemlyn Bay SSSI) is located approximately 250m west of the study area. This site is designated for its internationally important breeding populations of four species of tern: Arctic tern (*Sterna paradisaea*); common tern (*Sterna hirundo*); roseate tern (*Sterna dougallii*); and Sandwich tern (*Sterna sandvicensis*). These tern species breed at this location and represent between 1.5% and 5% of the populations in Great Britain (JNCC, 2001).

Wylfa Head candidate Wildlife Site, located within the Wylfa Newydd Development Area, is notable for chough which breed on the cliffs, a colony of gulls including black-headed gull (*Chroicocephalus ridibundus*) and herring gull (*Larus argentatus*), which nest near Porth Wnal. Two breeding pairs of chough at this location comprise approximately 1% of the Welsh Breeding Population.

#### 3.1.2 Habitats

Land within and surrounding the Wylfa Newydd Development Area is predominantly in agricultural use for grazing by sheep or cattle. The study area is also crossed by a network of rural lanes, watercourses and overhead electricity infrastructure.

The main habitats within the study area comprise:

- improved grassland with areas of semi-improved grassland and arable fields also present;
- smaller parcels and isolated blocks of plantation coniferous woodland and dense and scattered scrub distributed across the study area with the potential to support breeding birds such as chaffinch (*Fringilla coelebs*) coal tit (*Periparus ater*) and woodpecker species;
- marsh/marshy grassland, coastal grassland, heathland and amenity grassland with potential to support ground nesting species such as lapwing (*Vanellus vanellus*), curlew (*Numenius arquata*) and snipe;
- several kilometres of hedgerow, (although generally species poor and/or defunct) with the potential to support breeding species such as greenfinch (*Chloris chloris*) and yellowhammer (*Emberiza citrinella*); and
- other habitats found within the study area which included running and standing water (including inundated grassland) that could support wetland bird species, built up areas that could support species such as swallow (*Hirundo rustica*) and house sparrow (*Passer domesticus*), introduced shrub, stone walls, maritime hard cliff and crevice and ledge vegetation with potential to support breeding bird species such as chough.

Figure 1 in the Figures section at the end of the report shows the locations of all habitats within the study area.

#### 3.1.3 Species Records

Cofnod provided a total of 17,227 records of bird species within 2.5km of the study area between 1975 and 2013. This list was refined to those records between 1994 and 2013 and Category 1, 2 and 3 notable bird species (see table 1.1) as older records were considered historic and not representative of the current situation. This produced over 15,000 individual records from 175 species (plus 10 sub-species). These records are shown in figure 2 and detailed in appendix A.

In summary, 83 species recorded within 2.5km of the study area are either legally protected or are a Species of Principal Importance in Wales in accordance with Section 42 of the NERC Act (2006). These include: chough, kingfisher (*Alcedo atthis*), lapwing, marsh harrier (*Circus aeruginosus*) and redwing (*Turdus iliacus*). The breeding status of these species at the time of record was often not noted. It should also be noted that while some of these species are regularly recorded in the study area, many others were specifically recorded because they were uncommon in the area and are therefore not representative of the common baseline condition.

Eleven bird species had been previously recorded within the defined Wylfa Newydd Development Area: chough; grasshopper warbler (*Locustella naevia*); common crossbill; fieldfare (*Turdus pilaris*); kestrel; kingfisher; peregrine; redwing; reed bunting (*Emberiza schoeniclus*); spotted flycatcher (*Muscicapa striata*); and yellowhammer. Again, the breeding statuses of these species were absent from the records.

As of 2014 there were four known chough nest sites within the Wylfa Newydd Development Area used by three separate pairs (Cross and Stratford, 2015). Fledgling chicks were recorded each year between 2009 and 2014.

Surveyors have also received information from Horizon staff and local tenants/land owners during their field surveys. This information consisted of records of mostly common and garden species. However, in 2014 the tenant at Felin Gafnan informed the field survey team that a corncrake had been heard near the property. This is discussed further in section 4.3.

## 3.2 Field Survey

### 3.2.1 Transects

Transect routes are shown in figure 3. The main habitat types present on and adjacent to the six transects are provided in table 3.1.

Five years of combined transect data has recorded a total of 100 different bird species. Details are shown in table 3.2. In summary, during the five years of survey a total of 70 different bird species were classified as confirmed breeding species, as shown in table C.1, Appendix C. For the remaining species, five were probably breeding, nine were possibly breeding, and sixteen were non-breeding. Seventeen species were identified as confirmed breeding species for all five years of survey.

A total of 36 notable species were recorded during the breeding bird survey. Twenty-six of these species were confirmed breeding, with one probable and three possible breeding species. Six notable species were assessed as not breeding within the study area.

**Table 3.1: Summary of main habitat types on each transect**

Transect	Grassland – Improved	Grassland – Semi-improved	Grassland – Amenity	Grassland – Coastal	Marsh/Marshy Grassland	Plantation Woodland	Dense scrub/hedgerows	Coastal heath	Maritime hard cliff	Crevice and ledge vegetation	Arable	Built-up areas	Running water
Transect 1	■	■	■	-	■	■	■	-	■	■	■	-	-
Transect 2	■	■	■	■	■	■	■	■	-	-	-	-	■
Transect 3	■	■	■	-	■	-	■	-	-	-	■	■	-
Transect 4	■	■	-	-	■	-	■	-	-	-	-	-	■
Transect 5	■	■	-	-	■	-	■	-	-	-	■	-	■
Transect 6	■	■	■	-	■	-	■	-	-	-	-	-	■

Table 3.2: Number of Breeding Bird Species – Transect Summary (2010 – 2014)

Breeding Status	Number of Species				
	2010	2011	2012	2013	2014
Confirmed	27	29	63	44	41
Probable	7	4	4	8	14
Possible	14	12	3	9	13
Not Breeding	12	5	5	12	14
Total	60	50	75	73	82

### 3.2.2 Target Species Surveys

Figure 4 shows the location of the vantage point and additional small transects to capture records for specified bird species of interest. A compiled results table is provided below in table 3.3, with conformed breeding species highlighted in bold. The breeding status of each species is also given; where a species was seen on multiple occasions the highest breeding status is provided.

Table 3.3: Target species survey results and breeding status (CB = Confirmed Breeding; PB = Probable Breeding; PsB = Possible Breeding; NB = Not Breeding; and - = Not observed)

Species	2012	2013	2014
Buzzard	-	NB	PB
Chough	PB	-	CB
Common crossbill	NBB	-	-
Goshawk	PB	-	-
Grey heron	-	CB	CB
Kestrel	CB	NB	CB
Little egret	-	-	PsB
Merlin	NB	-	-
Peregrine	NB	-	NB
Short-eared owl	PsB	-	-
Snipe	CB	-	-
Sparrowhawk	-	-	PB
Woodcock	-	-	-

Forty-three additional bird species were recorded during the target species surveys that were identified as displaying behaviour characteristic of breeding; these are provided in appendix B. Eleven of these were confirmed as breeding: carrion crow (*Corvus corone*); chiffchaff (*Phylloscopus collybita*); herring gull; house sparrow; lesser redpoll (*Carduelis cabaret*); linnet (*Carduelis cannabina*); meadow pipit (*Anthus pratensis*); skylark; song thrush; starling (*Sturnus vulgaris*); and tawny owl (*Strix aluco*).

### 3.2.3 Incidental Sightings

Records of notable bird species made during other surveys than the specified transect and target species surveys are detailed in table 3.4. Eight species were recorded; two with confirmed breeding and three possible breeding species.

**Table 3.4: Incidental sightings log**

<b>Species</b>	<b>Date</b>	<b>Comments</b>	<b>Breeding Status</b>
2013			
Chough	April 2013	Breeding chough on Wylfa Head and Mynydd y Wylfa.	Confirmed breeder
Cuckoo ( <i>Cuculus canorus</i> )	May 2013	Male heard calling at Porth y Wylfa.	Possible breeder
Stonechat ( <i>Saxicola torquata</i> )	May 2013	Female carrying food to a nest at Trwyn Pencarreg.	Confirmed breeder
2014			
Hen harrier ( <i>Circus cyaneus</i> )	April 2014	Female seen foraging. Cemlyn Bay.	Non-breeder
Short-eared owl	May 2014	Foraging. Cemaes Bay.	Non-breeder
Osprey ( <i>Pandion haliaetus</i> )	May 2014	Commuting. Cemlyn Bay.	Non-breeder
Manx shearwater ( <i>Puffinus puffinus</i> )	July 2014	Heard calling. At least two individuals. Wylfa Head.	Possible breeder

### 3.2.4 Results Summary

When combining the results for all field survey methods over the five years of survey, a total of 104 bird species have been identified within the study area. Full details for each species recorded are provided in appendix C.

During the five years of survey a total of 70 different bird species were classified as confirmed breeding species in the study area, as shown in table C.1, Appendix C. For the remaining 33 species, five species were probably breeding, 11 were possibly breeding and 18 species recorded were classified as non-breeding. Nineteen bird species were identified as confirmed breeding species during all five years of survey.

A summary of the number of species recorded is provided in table 3.5 along with the conservation status of each.

Twelve bird species recorded are listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), as shown in figure 5 (see Figure section at end of report). Barn owl and chough were confirmed as breeding in the study area (the barn owl survey results are reported separately). Peregrine and goshawk were possibly breeding in the study area. Common crossbill, fieldfare, merlin, hen harrier, redwing and whimbrel (*Numenius phaeopus*) were not breeding in the study area. Corncrake and osprey were recorded incidentally on single occasions with no specific grid reference that could be mapped; neither was thought to be breeding within the study area.

A total of 53 notable species were recorded across the various breeding bird surveys. Figure 6.1 and figure 6.2 (see Figures section at end of this report) show the annual distribution of these notable species in a density map (2013 – 2014). Thirty-one of these species were confirmed breeding, with three probable and seven possible breeding species. Ten notable species were assessed as not breeding within the study area.

The notable species recorded included 17 Red list species and 30 Amber list species. Eleven species are listed under Annex II of the Directive on the Conservation of Wild Birds 79/409/EEC (the Birds Directive) (European Commission, 2014). Twenty-one bird Species of Principal Importance in Wales listed in accordance with the requirements of Section 42 of the NERC Act (2006) (WBP, 2014) were recorded. Five species are listed on the Anglesey LBAP.

**Table 3.5: All recorded species – breeding status**

<b>Protection / Conservation Status</b>	<b>Number of Species</b>				
	<b>Total</b>	<b>Confirmed Breeding</b>	<b>Probably Breeding</b>	<b>Possibly Breeding</b>	<b>Non-breeding</b>
Schedule 1	12	2	2	0	8
Annex II	11	2	0	5	4
Section 42 List	21	12	2	1	6
Red List	17	8	2	1	7
Amber List	30	21	1	2	6
LBAP	5	4	0	0	1

N.B. Protection and conservation status are not discrete categories and there is considerable overlap between them; as such the totals of each column do not correlate with the total number of species recorded for those respective categories during the surveys.

## 4. Discussion and Conclusions

### 4.1 Habitats

The majority of notable bird records obtained from Cofnod relate to birds recorded outside of the Wylfa Newydd Development Area, specifically the marine or coastal habitats at Cemlyn Bay (these habitats/sites where captured due to the 2.5km wide search area used for the desk study). The presence of the nearby marine and coastal habitats therefore accounts for the high proportion of wader and waterfowl species of conservation interest generated by the data search. However, relatively few of these records were from inland and even fewer were specifically from within the Wylfa Newydd Development Area (only eleven of the notable species generated by the Cofnod data search were recorded within the Wylfa Newydd Development Area). This is consistent with the field data collected which identified a diverse range of passerines, birds of prey and gulls within the terrestrial inland study area, and few waders and waterfowl.

Improved grassland was the dominant habitat type in the study area; this habitat has limited value for breeding birds. Most birds recorded during the surveys were found in their preferred habitats. For example; birds of prey such as buzzard were recorded in woodland and along hedgerows and diverse habitats where small mammal prey would be found; ducks, geese and swans were found in association with inland water features (streams, ponds and ditches); and waders and waterfowl were recorded along the coast.

Figure 6.1 and figure 6.2, when viewed in combination with figure 1, show that the more diverse and less intensively managed semi-improved and coastal grassland habitats to the north-east of the Existing Power Station, and the woodlands and marshy grassland to its east (including Tre'r Gof SSSI) were where the most species were recorded within the Wylfa Newydd Development Area. These areas represent the optimal nesting habitat in the study area and consequently where most individual birds were recorded. Outside of the Wylfa Newydd Development Area but within the wider study area, birds were recorded in highest numbers in the mosaic of habitats to the far south (south of Tregele) and in marshy grassland south-east of Cemlyn Bay.

Specific habitats within the study area have increased importance for some particular species, for example chough on coastal habitats, reedbeds for grasshopper warbler, and built-up areas for house sparrow and starling. Gulls were recorded in high numbers across the study area, in a variety of habitats, especially coastal habitats and grassland. The 13 bird Species of Principal Importance in Wales in accordance with the requirements of Section 42 of the NERC Act (2006) and confirmed as breeding were recorded in woodland, scrub and hedgerows; coastal grassland and heathland; and marshy grassland and semi-improved grassland habitats. The use of these habitats shows a bias towards the more diverse and less agriculturally managed areas.

Species of least conservation concern were also recorded in additional habitat types. For example, breeding wheatear (*Oenanthe oenanthe*) were recorded using stone walls, foraging waterfowl were recorded in improved grassland, and built up areas supported breeding swallows and house martins. The presence of game birds reflected the agricultural uses of the study area while the seabirds, although recorded inland, were on passage towards the sea. Both of these groups of birds are considered insignificant in the study area.

### 4.2 Breeding Species

As of 7<sup>th</sup> February 2015, 598 species of bird had been recorded in Great Britain (Britain Ornithologists Union, 2015). Approximately 270 are thought to have been breeding in Great Britain from 2006 onwards (Musgrove et al. 2013). The 104 bird species recorded in the study area, 70 of which were confirmed as breeding, represents approximately 26% and 17% of the British totals, respectively. At around a quarter of the British species present within the study area this would suggest that the overall study area is of some importance for breeding birds.

Comparing the number of confirmed breeding species in the study area to value produced by Fuller (1980) suggests that the habitats present support an assemblage of regional significance. This is considered to be an over-valuation, caused by higher numbers following an extended survey effort and the size of the site. The total

number is therefore assessed as not being exceptional for a site as large as the study area, supporting the variety of habitats present. This includes the presence of notable and protected species which appeared in species numbers and densities which would not be exceptional for a site the size of the study area.

### 4.3 Notable Breeding Species

None of the four tern species listed as qualifying features from the nearby Ynys Feurig, Cemlyn Bay and The Skerries SPA were recorded within the study area during the breeding bird field surveys. This is likely to be due to the fact that these terns ordinarily forage and commute over the sea, and because they only nest on the island in Cemlyn Lagoon rather than in any other terrestrial habitats in the study area.

Chough and barn owl were the two Schedule 1 species in the study area with confirmed breeding (barn owl are considered in further detail in a separate report). Data obtained from the Welsh Chough Project (unpublished, Cross and Stratford, 2015) provides a much finer level of detail with respect to breeding success by the species within the study area. These data show that there are four nesting sites within the study area and since 2007, breeding has generally been attempted by two pairs of chough every year in at least one of these sites (two in a building in the Existing Power Station and two on cliffs on Wylfa Head), with the most recent attempts in 2015 failing. In Great Britain 250 - 350 pairs of chough are thought to be breeding (RSPB, 2015) with over 30 pairs recorded on Anglesey (Anglesey LBAP, undated), mainly on the north western coastline associated with the study area; the Anglesey population therefore represents approximately 10% of the Welsh population. The Welsh Chough Project data also reported that the condition of foraging habitat on Wylfa Head was less favourable compared to previous years, and that this was probably as a result of reduced grazing.

The remaining ten Schedule 1 bird species recorded in the study area were not recorded in significant numbers or with any regularity, suggesting that none breed in the study area, or are resident for any period of time. It is unsurprising that these species were occasionally recorded within such a large study area that has been studied intensively for five years.

The 13 bird Species of Principal Importance in Wales listed in accordance with the requirements of Section 42 of the NERC Act (2006) and confirmed as breeding were: bullfinch, chough, dunnock (*Prunella modularis*), grasshopper warbler, herring gull, house sparrow, kestrel, lesser redpoll, linnet, reed bunting, skylark, song thrush and starling.

Certain species recorded within the study area by the desk study can be discounted from this assessment; for example, over-wintering species such as greater scaup (*Aythya marila*) and purple sandpiper (*Calidris maritima*); summer vagrants such as bee-eater (*Merops apiaster*); or migrant sea birds such as the Arctic skua (*Stercorarius parasiticus*). Other rarer bird species and ‘oddities’ recorded in the study area, such as twite (*Carduelis flavirostris*) are considered unlikely to be breeding (or regularly breeding) and would be peripheral to main population concentrations elsewhere in the country.

The record of a corncrake from the tenant at Felin Gafnan was investigated further using an internet search of birding blogs (e.g. [webirdnorthwales.blogspot.co.uk](http://webirdnorthwales.blogspot.co.uk)) in an attempt to substantiate the record. This search found that the most recent record was from 2012 and that the location of the bird was in the vicinity of Tregele. The record from 2014 is therefore the only record of the species since July 2012 to the time of publication. The evidence from the record suggests that the calls belonged to a single bird potentially in transit to other potential breeding sites and did not stay in the study area for any significant period of time. Should the bird have remained in the area then it is highly likely that its loud and distinctive call would have been recorded by Jacobs surveyors or local bird watchers in the area and would be reported in blogs and other online publications. The 2012 Tregele bird was well publicised in online literature including [www.webirdnorthwales.blogspot.com](http://www.webirdnorthwales.blogspot.com), [www.birdsinwales.org.uk](http://www.birdsinwales.org.uk), [www.dailypost.co.uk](http://www.dailypost.co.uk), making it less likely that a corncrake with a territory in the local area would have gone unnoticed.

The physical evidence of corncrake being present in the study area consists of one male calling in 2012 (for one week (15 – 22 July<sup>3</sup>) and a single male call in July 2014 (from tenant of Felin Gafnan). This is not suggestive of

<sup>3</sup> From [www.webirdnorthwales.blogspot.com/2012/07/anglesey-corncrake.html](http://www.webirdnorthwales.blogspot.com/2012/07/anglesey-corncrake.html)

the study area supporting breeding pairs of the species. This is supported by the amount of habitat suitable for breeding by corncrake in the study area being extremely low, i.e. there are only small patches of cool, fairly thick and tall stands of grass or herbs present in the study area, due to the domination of heavily grazed pasture. However, some habitat does exist, and while it is not considered that there is enough evidence to include corncrake as a determining factor in the assessment of the value and sensitivity rating of the study area, the potential for the species to occupy suitable habitats in the future and immediately prior to any enabling works should not be discounted.

Manx shearwaters were also heard calling to the south of Wyfia Head during an evening Vantage Point Survey in 2014. Shearwaters are known to call as they drift over land, particularly between June and August (Lovegrove *et al.*, 1994). It is therefore considered that this record was from birds flying over the site and that it is extremely unlikely that the species has bred in the study area, with the most likely and nearest location for potential nesting sites being Ynys yr Wyn island in Porth Yr Ogof, outside of the study area.

A direct comparison between each year's data has not been attempted in this report as differences in methodology and survey extent across the survey time period are evident. However, the data does suggest that not all species are recorded each year and that breeding status can also change in this time. Of the 32 notable species with confirmed breeding status recorded during the five years of survey, just eight were recorded every year (between 2010 and 2014, inclusive) due to either species not being observed every year or where a species was recorded but a confirmed breeding status could not be established.

#### **4.4 Conclusions**

A total of 104 species were recorded in the study area during the breeding bird surveys, of which 70 were confirmed to be breeding. Within the 104 total, 53 were notable species, i.e. those afforded special protection or which are of conservation concern, of which 31 were confirmed breeding species.

In the context of using the assemblage valuation method suggested by Fuller (1980), this suggests that there is an assemblage present of regional importance. However, due to the size of the study area and level of survey effort, a local rating is considered to be more appropriate. This includes an acknowledgement of the species of notable species, including those listed on Schedule 1 of the WCA, which is also not surprising for a site the size of the study area.

The study area provided widespread breeding and foraging habitat that supported a diverse bird population. Whilst a large proportion of the species recorded during the surveys are generally considered to be common and widespread, certain habitats provided nesting and foraging resources for notable species. The most important habitats within the study area that provided resources for local populations of breeding species were considered to be those that were less intensively managed. These included woodland and scrub/hedgerows, grassland (semi-improved and coastal), marsh/marshy grassland, coastal heath/grassland mosaic, maritime hard cliff and crevice and ledge vegetation mosaic and built-up areas (see figure 1).

## 5. References

- Anglesey Council. Undated. *Local Biodiversity Action Plan - Working for the Wealth of Wildlife II - Gweithio dros Cyfoeth Byd Natur II.*
- Arup. 2012. *Breeding Bird Surveys 2010 and 2011*. Unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd.
- Arup. 2013. *Breeding Bird Survey Report 2012*. Unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd.
- Bibby, C., Burgess, N.D., Hill, D. and Mustoe, S. 2000. *Bird Census Techniques – Second Edition*, Academic Press, London, England.
- British Ornithologists' Union. 2015. "British Ornithologists' Union Records Committee: 44th Report (January 2015)". *Ibis*. 157: 413-455.
- British Trust for Ornithology. 2013. *Bird Atlas 2007-11: The Breeding and Wintering Birds of Britain and Ireland*. British Trust for Ornithology.
- Cross and Stratford. 2015. *Welsh Chough Project Report*. Unpublished report supplied to Jacobs.
- Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D., and Gregory, R.D. 2015. Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man, *British Birds*, 108: 708-746.
- Fuller, R.J. 1980. A method for assessing the ornithological interest of sites for conservation. *Biological Conservation*. 17: 229-239.
- Gilbert, G., Gibbons, D.W. and Evans, J. 1998. *Bird monitoring methods: a manual of techniques for key UK species*, Royal Society for the Protection of Birds.
- Jacobs. 2014. *Consultancy Report - Breeding Bird Baseline Survey Report 2013*. Unpublished Report on behalf of Horizon Nuclear Power (Wylfa) Ltd. Ref. W202.01-S5-PAC-REP-00016.
- Jacobs. 2014a. *Consultancy Report - Breeding Bird Survey Baseline Report 2014*. Unpublished Report on behalf of Horizon Nuclear Power (Wylfa) Ltd. Ref. WN03.01.01-S5-PAC-REP-00012.
- Jacobs. 2015. *Consultancy Report - Technical Summary Report – Barn owl (*Tyto alba*)*. Unpublished Report on behalf of Horizon Nuclear Power (Wylfa) Ltd. Ref. WN034-JAC-PAC-REP-00004.
- Joint Nature Conservation Committee. 2001. SPA description - Ynys Feurig, Cemlyn Bay and The Skerries Special Protection Area [<http://jncc.defra.gov.uk/page-2055-theme=default>] Accessed June 2015
- Joint Nature Conservation Committee. 2013. UK BAP Priority Bird Species [<http://jncc.defra.gov.uk/page-5163>] Accessed June 2015.
- Lovegrove, R., Williams, G. and Williams I. 1994. *Birds in Wales*, Poyser Ltd., London.
- Musgrove, A., Aebischer, N., Eaton, M., Hearn, R., Newson, S., Noble, D., Parsons, M., Risely, K. and Stroud, D. 2013. Population estimates of birds in Great Britain and the United Kingdom. *British Birds*. 106: 64-100.
- Royal Society for the Protection of Birds. 2015. Chough [[https://www.rspb.org.uk/discoverand-enjoy-nature/discoverandlearn/birdguide/name/c/chough/index.aspx](https://www.rspb.org.uk/discoverand-enjoy-nature/discover-and-learn/bird-guide/name/c/chough/index.aspx)] Accessed June 2015.

Wales Biodiversity Partnership. 2014. Section 42 list [<http://www.biodiversitywales.org.uk/Section-42-Lists>]  
Accessed June 2015.

## **Figures**

This page has been left blank.

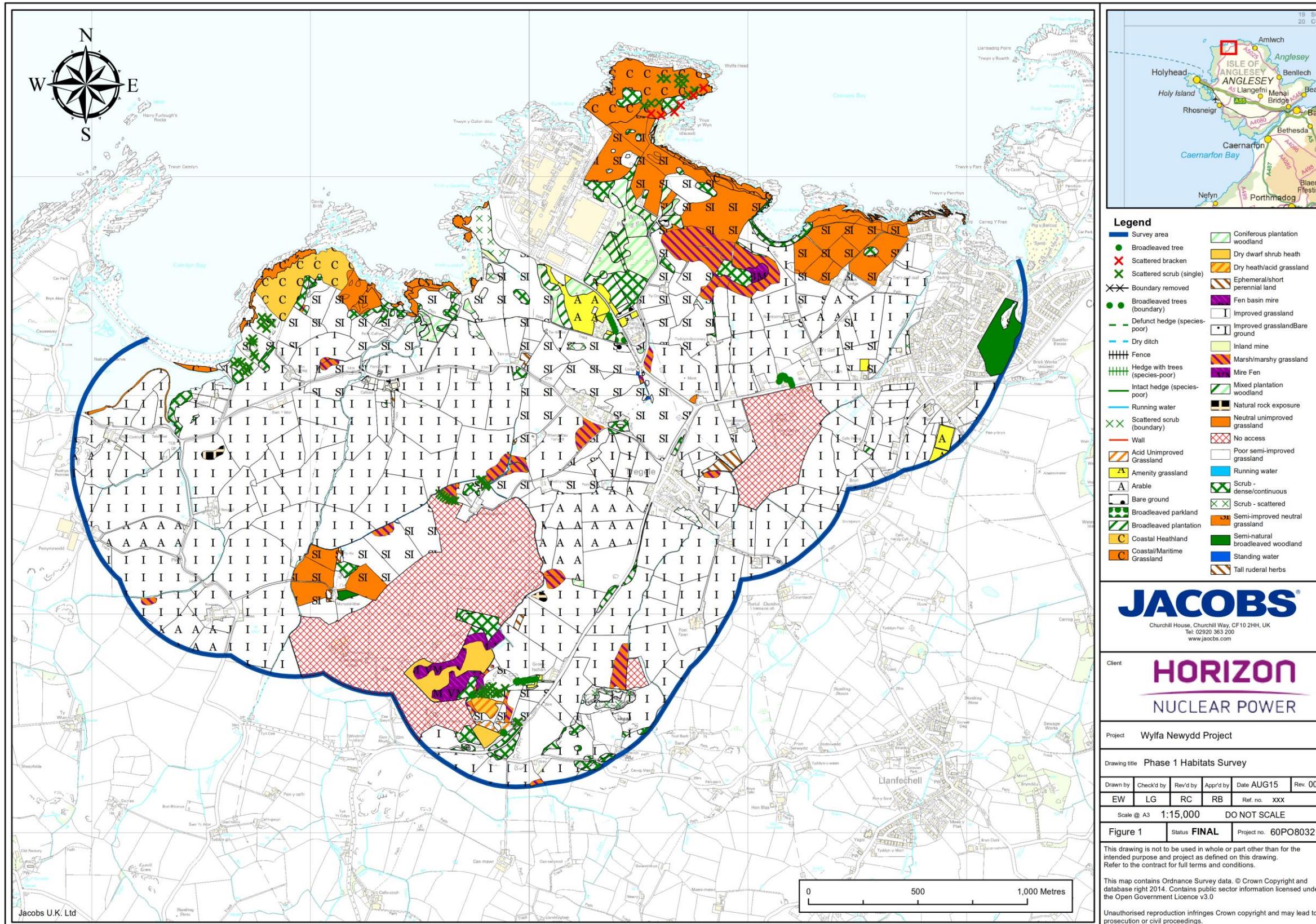


Figure 1 Phase 1 Habitat Survey

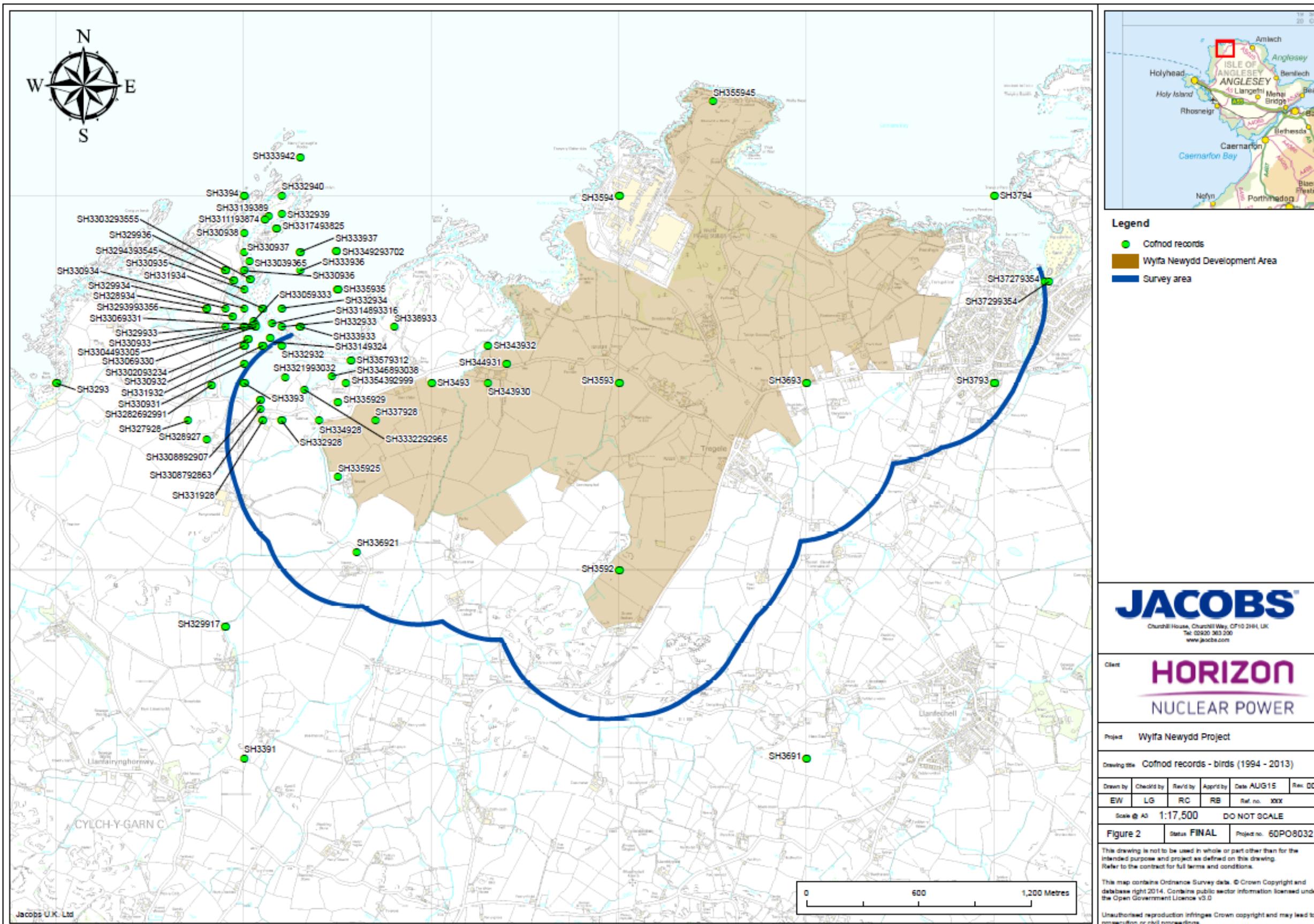


Figure 2 Cofnod Records of Birds

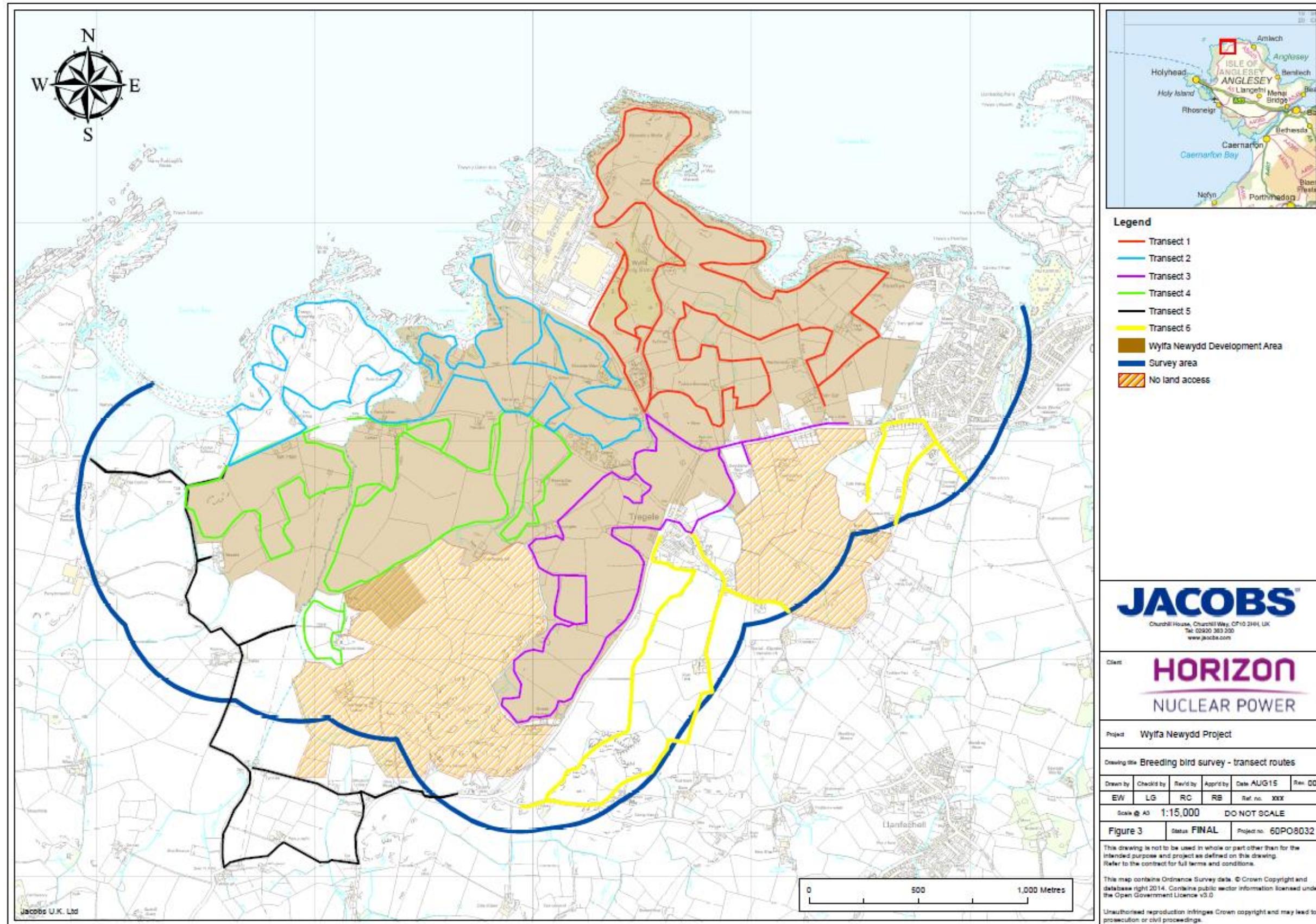


Figure 3 Breeding Bird Survey – Transect Routes

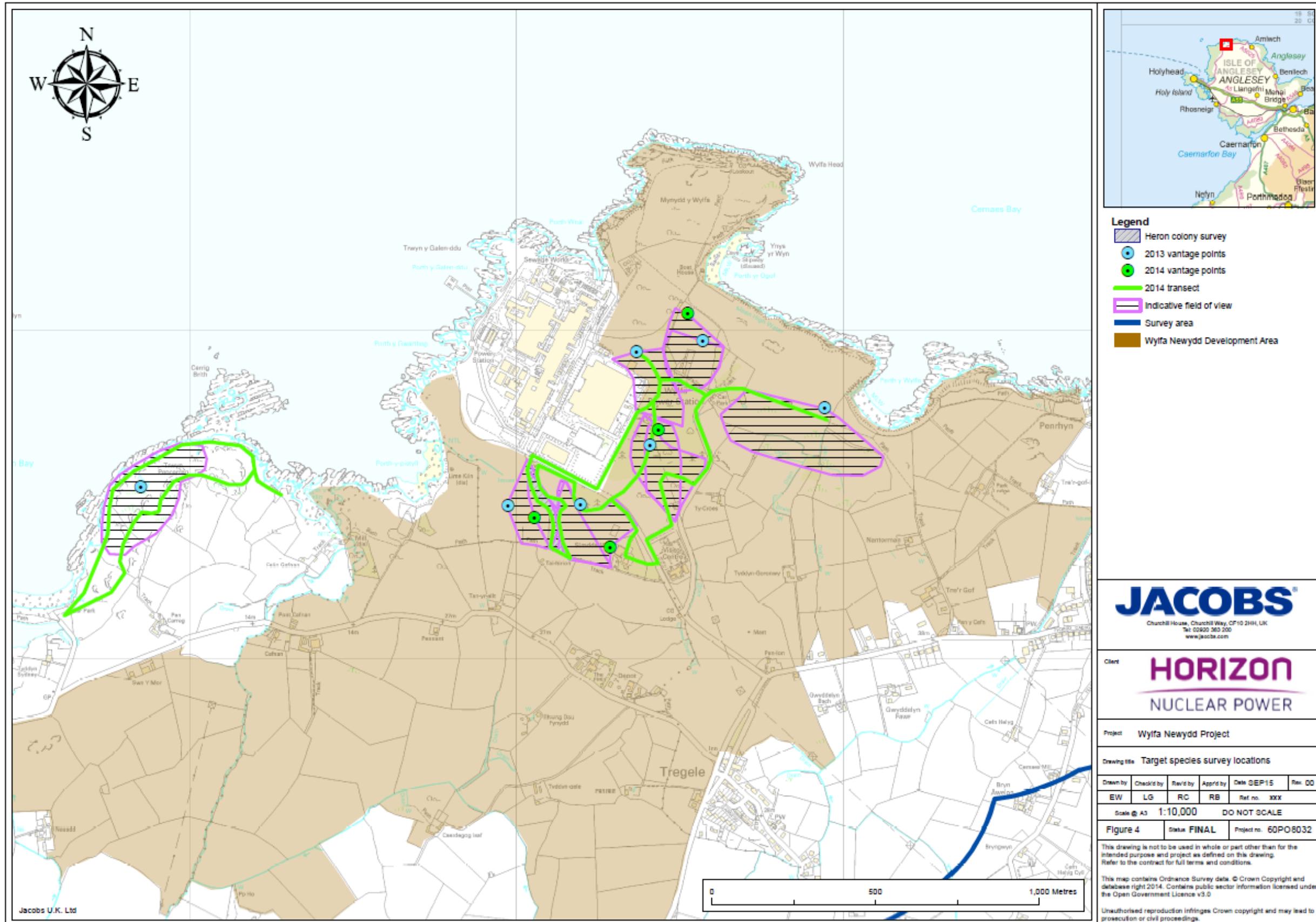


Figure 4 Target Species Survey Locations

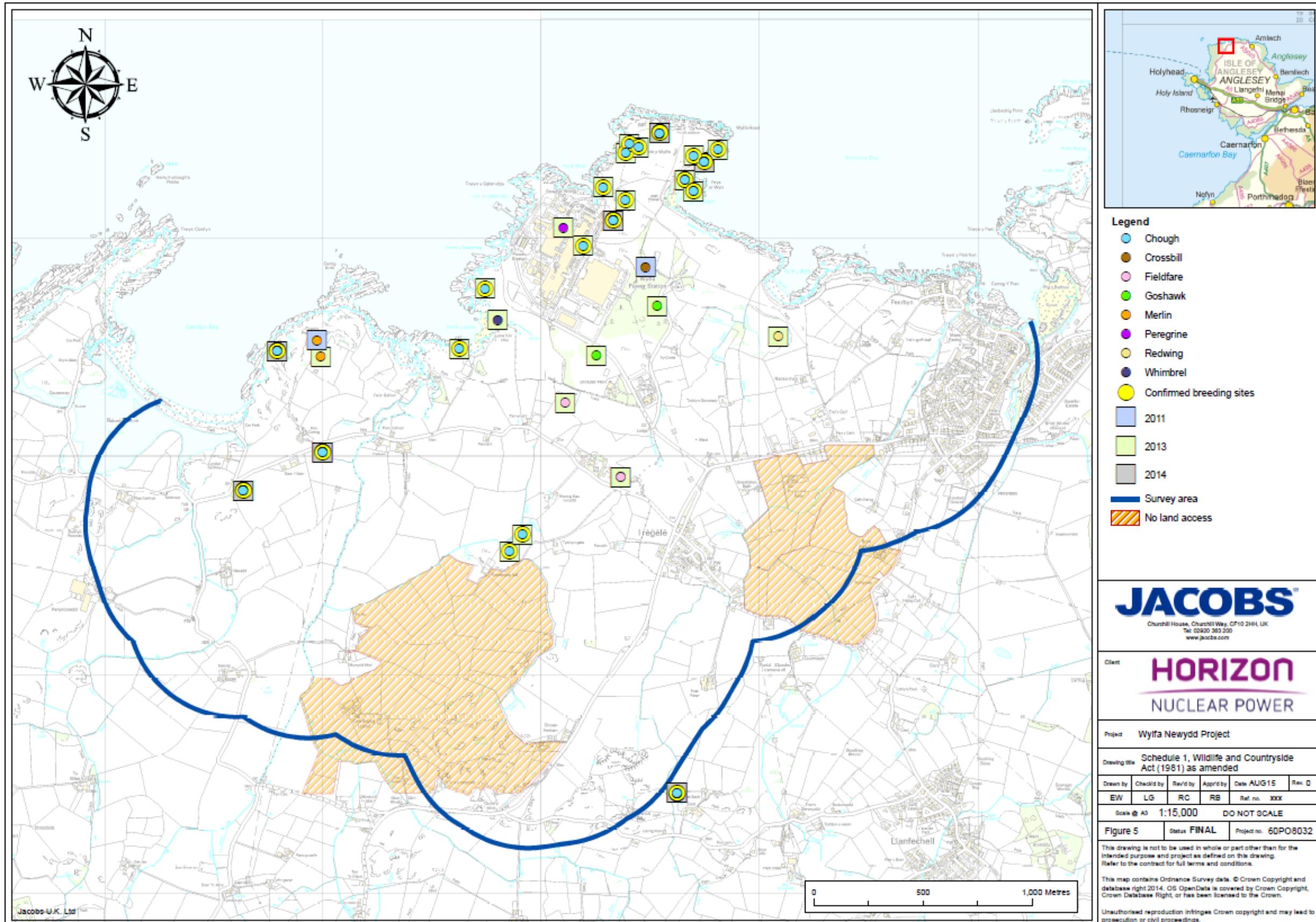


Figure 5 Recorded Bird Species – Schedule 1 Wildlife and Countryside Act 1981 (as amended)

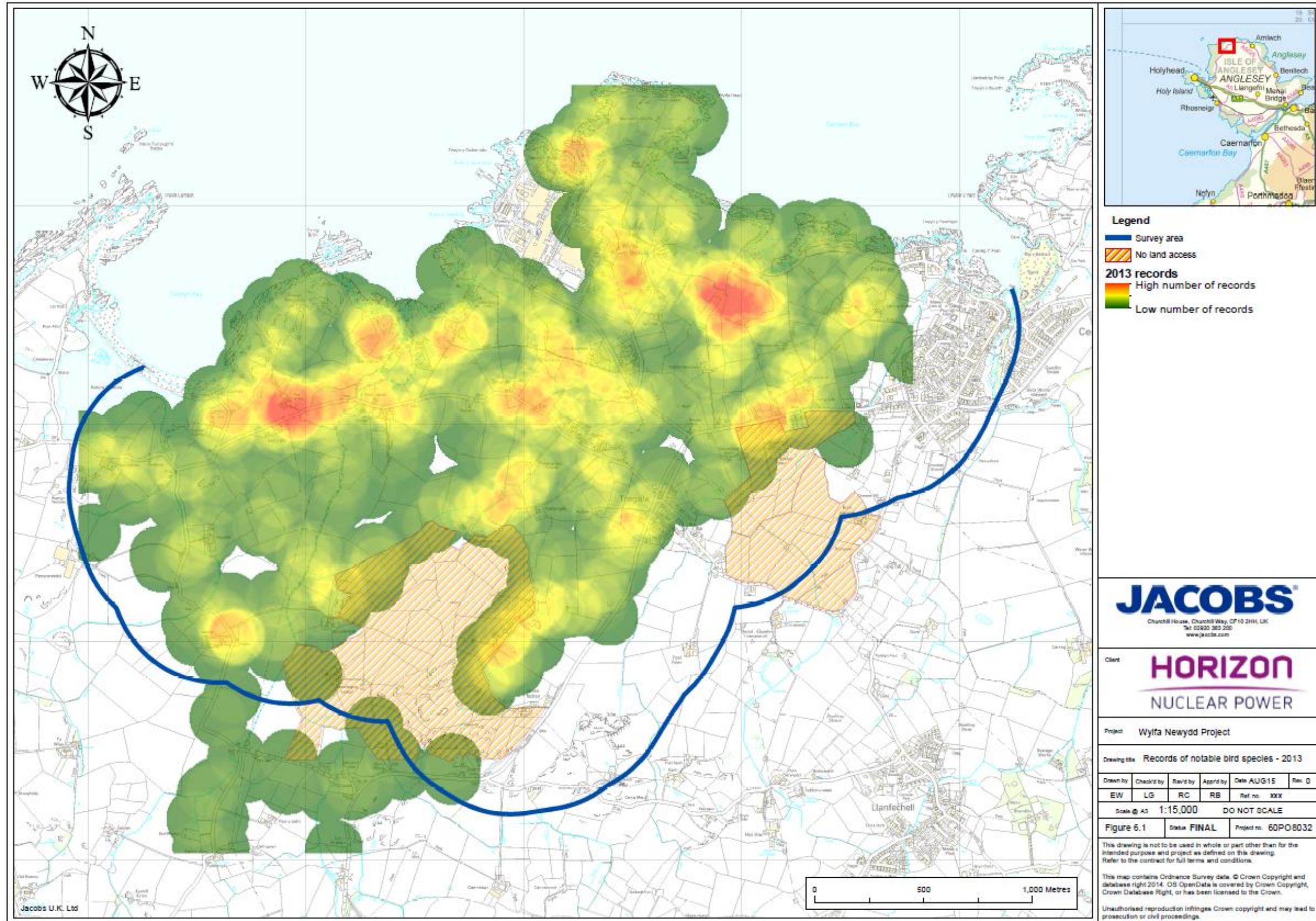


Figure 6.1 Records of Notable Bird Species – 2013

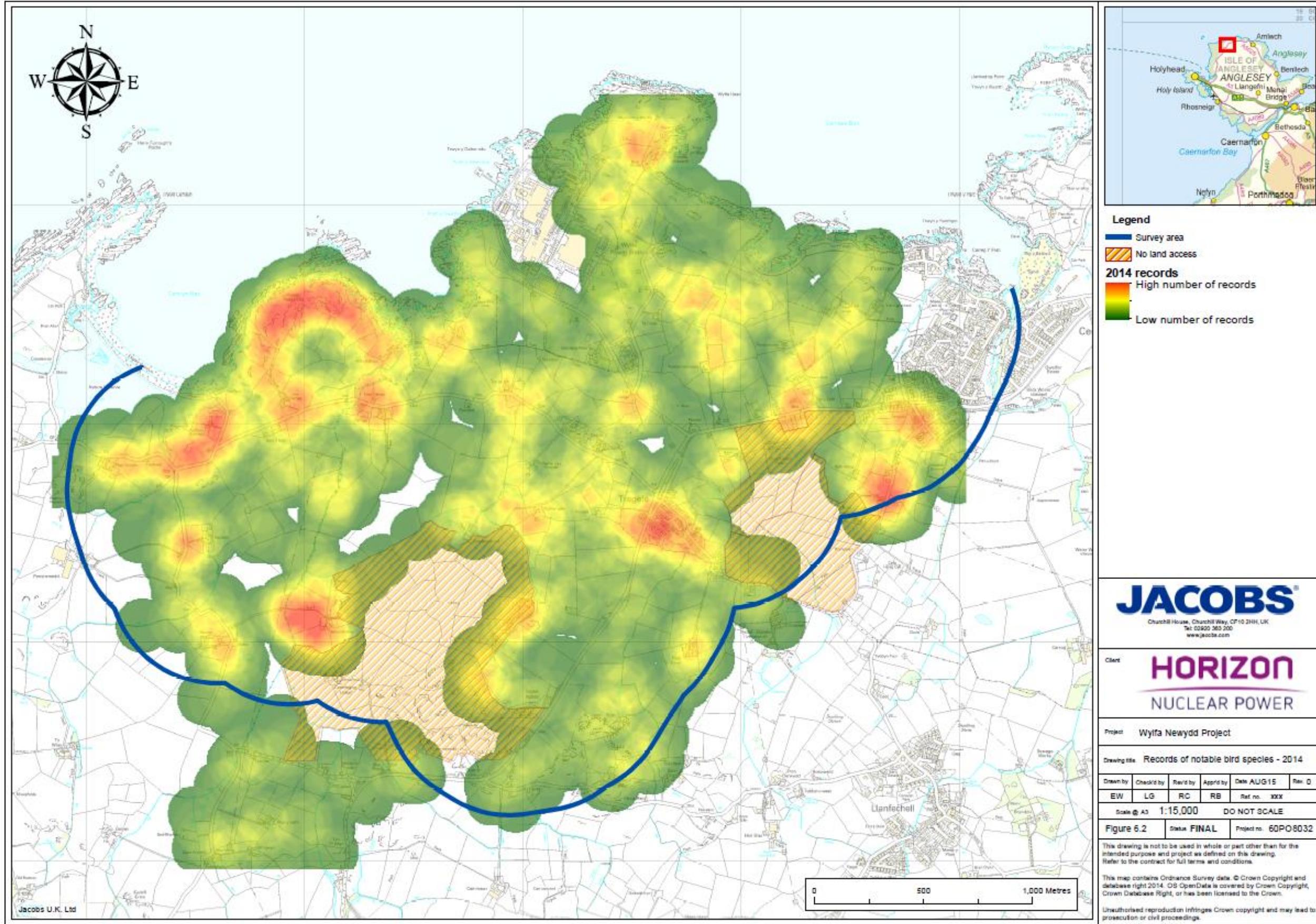


Figure 6.2 Records of Notable Bird Species – 2014

## **Appendix A. Cofnod Data**

This page has been left blank.

Scientific Name	Common Name	Importance Category	Grid Reference	Location	Records Summary
<i>Accipiter gentilis</i>	Goshawk	1	SH3793	Cemaes Bay	24/06/2000
<i>Alcedo atthis</i>	Kingfisher	1	SH33937	Cemlyn Bay	23/09/2004
<i>Alcedo atthis</i>	Kingfisher	1	SH334928	Cemlyn Bay; Lagoon	25/12/2000
<i>Alcedo atthis</i>	Kingfisher	1	SH3393	Cemlyn	16 records September 1994 - 01/07/2011
<i>Alcedo atthis</i>	Kingfisher	1	SH3793	Cemaes Bay	5 records 12/09/2000 - 08/08/2008
<i>Anas acuta</i>	Northern Pintail	1	SH3293	Cemlyn	5 records 30/08/1999 - 02/01/2006
<i>Anas querquedula</i>	Garganey	1	SH330932	Cemlyn	2 records 2002 - 2003
<i>Anas querquedula</i>	Garganey	1	SH333933	Cemlyn Bay	17/07/2006
<i>Anas querquedula</i>	Garganey	1	SH3393	Cemlyn Bay	5 records 29/05/1994 - 22/07/2006
<i>Anser anser</i>	Greylag Goose	1	SH3293	Cemlyn	27/05/1996
<i>Anser anser</i>	Greylag Goose	1	SH3302093234	Cemlyn	02/06/2012
<i>Anser anser</i>	Greylag Goose	1	SH330932	Cemlyn	6 species - 2002 - 09/05/2008
<i>Anser anser</i>	Greylag Goose	1	SH331932	Cemlyn NWWT Reserve	18/05/2013
<i>Anser anser</i>	Greylag Goose	1	SH3393	Cemlyn	123 records - May 1994 - 11/08/2013
<i>Anthus trivialis</i>	Tree Pipit	1	SH330932	Cemlyn	22/05/2003
<i>Anthus trivialis</i>	Tree Pipit	1	SH3393	Cemlyn	11 records - 10/05/1994 - 30/04/2012
<i>Aythya marila</i>	Greater Scaup	1	SH332928	Cemlyn	5 records - 28/10/2000 - 25/12/2000
<i>Aythya marila</i>	Greater Scaup	1	SH3393	Cemlyn	46 records - 12/06/1998 - 07/08/2010
<i>Branta bernicla subsp. bernicla</i>	Dark-bellied Brent Goose	1	SH3393	Cemlyn Bay	25/12/2000
<i>Bucephala clangula</i>	Goldeneye	1	SH329936	Cemlyn Bay	25/12/2004
<i>Bucephala clangula</i>	Goldeneye	1	SH331932	Cemlyn	2 records - 26/01/2008 - 25/03/2008
<i>Bucephala clangula</i>	Goldeneye	1	SH333933	Cemlyn Bay	4 records - 09/01/2003 - 08/12/2003
<i>Bucephala clangula</i>	Goldeneye	1	SH335935	Cemlyn	7 records - 30/01/2007 - 25/12/2008
<i>Bucephala clangula</i>	Goldeneye	1	SH3393	Cemlyn	81 records - 07/06/1994 - 02/03/2008
<i>Calidris lapponicus</i>	Lapland Longspur	1	SH3393	Cemlyn	26 records - 26/03/1999 - 06/03/2011
<i>Calidris maritima</i>	Purple Sandpiper	1	SH329936	Cemlyn Bay	2 records - 21/01/2004 - 25/12/2004
<i>Calidris maritima</i>	Purple Sandpiper	1	SH330932	Cemlyn	14/05/2003
<i>Calidris maritima</i>	Purple Sandpiper	1	SH331932	Cemlyn NWWT Reserve	4 records - 03/01/2008 - 18/05/2013
<i>Calidris maritima</i>	Purple Sandpiper	1	SH333942	Cemlyn	25/12/2000
<i>Calidris maritima</i>	Purple Sandpiper	1	SH335935	Cemlyn	3 records - 25/12/2006 - 25/12/2007
<i>Calidris maritima</i>	Purple Sandpiper	1	SH3393	Cemlyn	65 records - May 1997 - 30/04/2012
<i>Carduelis cabaret</i>	Lesser Redpoll	1	SH330932	Cemlyn	2 records - 25/07/2008 - 18/05/2013
<i>Carduelis cabaret</i>	Lesser Redpoll	1	SH3393	Cemlyn	28 records - 05/05/1995 - 14/05/2013
<i>Carduelis cabaret</i>	Lesser Redpoll	1	SH3793	Cemaes Bay	2 records - 0/03/1999 - 13/01/2000
<i>Carpodacus erythrinus</i>	Common Rosefinch	1	SH3393	Cemlyn	2 records - 05/06/2010 - 06/06/2010
<i>Charadrius dubius</i>	Little Plover	1	SH3393	Cemlyn	3 records - 15/05/2005 - 03/06/2010
<i>Charadrius hiaticula</i>	Ringed Plover	1	SH329933	Cemlyn; Shingle ridge	Spring 2011
<i>Charadrius hiaticula</i>	Ringed Plover	1	SH3302093234	Cemlyn	2 records - all 02/06/2012
<i>Charadrius hiaticula</i>	Ringed Plover	1	SH3309365	Cemlyn Bay Nature Reserve	18/05/2011
<i>Charadrius hiaticula</i>	Ringed Plover	1	SH330932	Cemlyn	25 records - 2002 - 23/07/2008
<i>Charadrius hiaticula</i>	Ringed Plover	1	SH330938	Cemlyn; Trwyn	2 records - 17/05/2011 - 22/05/2011
<i>Charadrius hiaticula</i>	Ringed Plover	1	SH3317493825	Cemlyn	02/06/2012
<i>Charadrius hiaticula</i>	Ringed Plover	1	SH331932	Cemlyn NWWT Reserve	6 records - 26/01/2008 - 18/05/2013
<i>Charadrius hiaticula</i>	Ringed Plover	1	SH332932	Cemlyn; Shingle ridge	4 records - spring 2011 - 25/07/2011

Scientific Name	Common Name	Importance Category	Grid Reference	Location	Records Summary
<i>Charadrius hiaticula</i>	Ringed Plover	1	SH333933	Cemlyn Bay	4 records - 29/04/2006 - 25/12/2006
<i>Charadrius hiaticula</i>	Ringed Plover	1	SH335935	Cemlyn	2 records - 14/05/2007 - 13/09/2007
<i>Charadrius hiaticula</i>	Ringed Plover	1	SH3393	Cemlyn	189 records - May 1994 - 08/08/2013
<i>Charadrius hiaticula</i>	Ringed Plover	1	SH3793	Cemaes Bay	26/12/2008
<i>Charadrius morinellus</i>	Dotterel	1	SH3393	Cemlyn; Fields north of Tyn Llan farm	5 records - 10/05/2005 - 23/05/2010
<i>Chlidonias niger</i>	Black Tern	1	SH329936	Cemlyn Bay	23/09/2004
<i>Chlidonias niger</i>	Black Tern	1	SH330932	Cemlyn; Lagoon Islands	02/05/2011
<i>Chlidonias niger</i>	Black Tern	1	SH3393	Cemlyn	13 records - April 1994 - 09/06/2011
<i>Circus aeruginosus</i>	Marsh Harrier	1	SH330932	Cemlyn	09/08/2003
<i>Circus aeruginosus</i>	Marsh Harrier	1	SH3393	Cemlyn	15 records - 06/05/1994 - 02/05/2012
<i>Circus cyaneus</i>	Hen Harrier	1	SH330932	Cemlyn	07/05/2008
<i>Circus cyaneus</i>	Hen Harrier	1	SH3393	Cemlyn	3 records - 05/05/2006 - 28/04/2011
<i>Clangula hyemalis</i>	Long-tailed Duck	1	SH3393	Cemlyn	2 records - 04/06/1994 - 31/05/1999
<i>Coturnix coturnix</i>	Quail	1	SH330932	Cemlyn	04/07/2008
<i>Coturnix coturnix</i>	Quail	1	SH3393	Cemlyn	2 records - 19/06/1997 - 13/05/2000
<i>Coturnix coturnix</i>	Quail	1	SH3793	Cemaes Bay	03/06/2005
<i>Cuculus canorus</i>	Cuckoo	1	SH329936	Cemlyn Bay	2 records - 24/05/2004-21/07/2004
<i>Cuculus canorus</i>	Cuckoo	1	SH330932	Cemlyn	4 records - 12/05/2002 - July 2008
<i>Cuculus canorus</i>	Cuckoo	1	SH333933	Cemlyn Bay	27/07/2006
<i>Cuculus canorus</i>	Cuckoo	1	SH3393	Cemlyn	34 records - 10/05/1994 - 16/07/2012
<i>Cuculus canorus</i>	Cuckoo	1	SH3793	Cemaes Bay	22/05/2004
<i>Cygnus cygnus</i>	Whooper Swan	1	SH3393	Cemlyn	7 records - 16/02/1999 - 17/10/2008
<i>Emberiza citrinella</i>	Yellowhammer	1	SH3393	Cemlyn; Flying over	2 records - 06/08/2010 - 16/05/2013
<i>Emberiza citrinella</i>	Yellowhammer	1	SH3693	Cemaes Bay	10 records - 27/01/1999 - 07/07/1999
<i>Emberiza citrinella</i>	Yellowhammer	1	SH3793	Cemaes Bay	20 records - 12/01/2000 - 12/04/2005
<i>Emberiza schoeniclus</i>	Reed Bunting	1	SH330932	Cemlyn	5 records - 2002 - 13/05/2008
<i>Emberiza schoeniclus</i>	Reed Bunting	1	SH331932	Cemlyn NWWT Reserve	4 records - 03/01/2008 - 18/05/2013
<i>Emberiza schoeniclus</i>	Reed Bunting	1	SH3354392999	Cemlyn	Jun-10
<i>Emberiza schoeniclus</i>	Reed Bunting	1	SH3393	Cemlyn	1 record - Spring 1999 – Summer 1999
<i>Emberiza schoeniclus</i>	Reed Bunting	1	SH3393	Cemlyn	73 records - May 1994 - 24/04/2012
<i>Emberiza schoeniclus</i>	Reed Bunting	1	SH3693	Cemaes Bay	12/02/1999
<i>Falco columbarius</i>	Merlin	1	SH3319389	Cemlyn	26/04/2012
<i>Falco columbarius</i>	Merlin	1	SH3393	Cemlyn	59 records - May 1997 - 26/05/2013
<i>Falco columbarius</i>	Merlin	1	SH3493	Cafnan, Cemlyn	15/01/2000
<i>Falco peregrinus</i>	Peregrine Falcon	1	SH293	Cemlyn	1 record - 07/05/1996 – 05/08/1996
<i>Falco peregrinus</i>	Peregrine Falcon	1	SH330932	Cemlyn	22 records - 10/05/2002 - 02/07/2008
<i>Falco peregrinus</i>	Peregrine Falcon	1	SH331932	Cemlyn	03/01/2008
<i>Falco peregrinus</i>	Peregrine Falcon	1	SH335935	Cemlyn Bay	25/12/2006
<i>Falco peregrinus</i>	Peregrine Falcon	1	SH3393	Cemlyn	74 records - 08/05/1994 - 01/08/2013
<i>Falco peregrinus</i>	Peregrine Falcon	1	SH3592	Tregelle	21/07/2000
<i>Falco peregrinus</i>	Peregrine Falcon	1	SH3793	Cemaes	5 records - 07/03/1999 - 29/07/2000
<i>Falco subbuteo</i>	Hobby	1	SH330932	Cemlyn	26/05/2003
<i>Falco subbuteo</i>	Hobby	1	SH3393	Cemlyn	2 records - 24/05/2003 - 02/06/2007
<i>Falco tinunculus</i>	Kestrel	1	SH3282692991	Cemlyn	03/06/2012

## Technical Summary Report – Breeding Birds

**JACOBS®**

Scientific Name	Common Name	Importance Category	Grid Reference	Location	Records Summary
<i>Falco tinnunculus</i>	Kestrel	1	SH3293	Cemlyn	2 records - Spring 1996 - Summer 1996
<i>Falco tinnunculus</i>	Kestrel	1	SH3308892907	Cemlyn	06/07/2013
<i>Falco tinnunculus</i>	Kestrel	1	SH330932	Cemlyn	4 records - 2002 - 15/07/2008
<i>Falco tinnunculus</i>	Kestrel	1	SH331932	Cemlyn	2 records - 03/01/2008 - 20/01/2008
<i>Falco tinnunculus</i>	Kestrel	1	SH3391	Tregele	18/06/2013
<i>Falco tinnunculus</i>	Kestrel	1	SH3393	Cemlyn	99 records - 03/05/1994 - 03/06/2012
<i>Falco tinnunculus</i>	Kestrel	1	SH3394	Trwyn Cemlyn	16/06/2010
<i>Falco tinnunculus</i>	Kestrel	1	SH3592	Tregele	3 records - 09/06/2008 - 01/12/2008
<i>Falco tinnunculus</i>	Kestrel	1	SH3793	Cemaes Bay	5 records - 06/07/2008 - 27/12/2008
<i>Ficedula hypoleuca</i>	Pied Flycatcher	1	SH330932	Cemlyn	2008
<i>Ficedula hypoleuca</i>	Pied Flycatcher	1	SH3393	Cemlyn	20/09/1995
<i>Fringilla montifringilla</i>	Brambling	1	SH3393	Cemlyn Bay	6 records - 17/10/2005 - 31/10/2005
<i>Gavia</i>	Indet. Diver	1	SH3393	Cemlyn; Trwyn Cemlyn	20/06/1994
<i>Gavia arctica</i>	Black-throated Diver	1	SH3393	Cemlyn	6 records - 17/02/1999 - 18/07/2005
<i>Gavia immer</i>	Great Northern Diver	1	SH330932	Cemlyn	19/05/2002
<i>Gavia immer</i>	Great Northern Diver	1	SH331932	Cemlyn	26/01/2008
<i>Gavia immer</i>	Great Northern Diver	1	SH333937	Cemlyn Bay	18/09/2004
<i>Gavia immer</i>	Great Northern Diver	1	SH3393	Cemlyn Bay	9 records - 07/11/1999 - 17/12/2005
<i>Gavia immer</i>	Great Northern Diver	1	SH3793	Cemaes Bay	19/01/2004
<i>Gavia stellata</i>	Red-throated Diver	1	SH329936	Cemlyn Bay	2 records - 17/03/2004 - 23/09/2004
<i>Gavia stellata</i>	Red-throated Diver	1	SH330930	Cemlyn	22/04/2008
<i>Gavia stellata</i>	Red-throated Diver	1	SH333936	Cemlyn Bay	3 records - 09/01/2003 - 15/03/2003
<i>Gavia stellata</i>	Red-throated Diver	1	SH335935	Cemlyn	3 records - 04/01/2007 - 25/12/2007
<i>Gavia stellata</i>	Red-throated Diver	1	SH3393	Cemlyn	55 records - 30/04/1998 - 31/05/2013
<i>Gavia stellata</i>	Red-throated Diver	1	SH355945	Wylfa; Head	08/10/2008
<i>Lanius collurio</i>	Red-backed Shrike	1	SH330932	Cemlyn	2002
<i>Lanius collurio</i>	Red-backed Shrike	1	SH3393	Cemlyn	23/08/2002
<i>Larus melanocephalus</i>	Mediterranean Gull	1	SH33059333	Cemlyn Bay Nature Reserve	18/05/2011
<i>Larus melanocephalus</i>	Mediterranean Gull	1	SH33069331	Cemlyn; Main Island	23/04/2012
<i>Larus melanocephalus</i>	Mediterranean Gull	1	SH330930	Cemlyn	29/04/2008
<i>Larus melanocephalus</i>	Mediterranean Gull	1	SH330932	Cemlyn	8 records - May 2002 - 01/06/2008
<i>Larus melanocephalus</i>	Mediterranean Gull	1	SH330933	Cemlyn; Main island	April 2011 – July 2011
<i>Larus melanocephalus</i>	Mediterranean Gull	1	SH331932	Cemlyn NWWT Reserve	4 records - 11/05/2013 - 18/05/2013
<i>Larus melanocephalus</i>	Mediterranean Gull	1	SH333933	Cemlyn Bay	2 records - 03/06/2006 - 28/06/2006
<i>Larus melanocephalus</i>	Mediterranean Gull	1	SH335935	Cemlyn	21/03/2007
<i>Larus melanocephalus</i>	Mediterranean Gull	1	SH338933	Cemlyn Bay	26/06/1999
<i>Larus melanocephalus</i>	Mediterranean Gull	1	SH3393	Cemlyn	82 records - 04/05/1995 - 08/05/2012
<i>Limosa lapponica</i>	Bar-tailed Godwit	1	SH329936	Cemlyn Bay	3 records - 04/06/2004 - 18/09/2004
<i>Limosa lapponica</i>	Bar-tailed Godwit	1	SH330932	Cemlyn	10 records - 17/05/2002 - June 2008
<i>Limosa lapponica</i>	Bar-tailed Godwit	1	SH330933	Cemlyn; Main Island	May 2011 – June 2011
<i>Limosa lapponica</i>	Bar-tailed Godwit	1	SH330937	Cemlyn Bay; Trwyn Cemlyn	01/09/2008
<i>Limosa lapponica</i>	Bar-tailed Godwit	1	SH331932	Cemlyn NWWT Reserve	2 records - all 18/05/2013
<i>Limosa lapponica</i>	Bar-tailed Godwit	1	SH335935	Cemlyn	30/04/2007
<i>Limosa lapponica</i>	Bar-tailed Godwit	1	SH3393	Cemlyn	47 records - 10/05/1994 - 28/07/2013

Scientific Name	Common Name	Importance Category	Grid Reference	Location	Records Summary
<i>Limosa limosa</i>	Black-tailed Godwit	1	SH329936	Cemlyn Bay	2 records - 04/06/2004 - 03/07/2004
<i>Limosa limosa</i>	Black-tailed Godwit	1	SH3304493305	Cemlyn	2 records - all 29/04/2013
<i>Limosa limosa</i>	Black-tailed Godwit	1	SH330932	Cemlyn	8 records - 25/05/2002 - 06/07/2008
<i>Limosa limosa</i>	Black-tailed Godwit	1	SH330936	Cemlyn Bay	23/04/2007
<i>Limosa limosa</i>	Black-tailed Godwit	1	SH331932	Cemlyn NWWT Reserve	11/05/2013
<i>Limosa limosa</i>	Black-tailed Godwit	1	SH332928	Cemlyn Bay	05/10/2000
<i>Limosa limosa</i>	Black-tailed Godwit	1	SH3393	Cemlyn	59 records - 10/05/1994 - 06/08/2013
<i>Locustella naevia</i>	Common Grasshopper Warbler	1	SH330932	Cemlyn	5 records - May 2002 - 28/07/2008
<i>Locustella naevia</i>	Common Grasshopper Warbler	1	SH3393	Cemlyn	33 records - 08/05/1994 - 23/04/2013
<i>Locustella naevia</i>	Common Grasshopper Warbler	1	SH344931	Cemlyn Bay	07/05/2004
<i>Loxia curvirostra</i>	Common Crossbill	1	SH3393	Cemlyn	19 records - 24/07/1994 - 01/08/2013
<i>Loxia curvirostra</i>	Common Crossbill	1	SH3593	Wylfa; Nature Trail	3 records - 19/03/2000 - 22/03/2000
<i>Loxia curvirostra</i>	Common Crossbill	1	SH3594	Wylfa	22/03/2000
<i>Luscinia svecica</i>	Bluethroat	1	SH3393	Cemlyn	25/04/2009
<i>Melanitta fusca</i>	Velvet Scoter	1	SH3393	Cemlyn	4 records - 27/06/1997 - 14/10/2004
<i>Melanitta nigra</i>	Common Scoter	1	SH3293	Cemlyn	4 records - 29/06/1996 - 12/07/1996
<i>Melanitta nigra</i>	Common Scoter	1	SH329936	Cemlyn Bay	3 records - 03/07/2004 - 23/09/2004
<i>Melanitta nigra</i>	Common Scoter	1	SH330932	Cemlyn	05/08/2002
<i>Melanitta nigra</i>	Common Scoter	1	SH333933	Cemlyn Bay	3 records - 03/06/2006 - 21/08/2006
<i>Melanitta nigra</i>	Common Scoter	1	SH335935	Cemlyn	5 records - 04/01/2007 - 19/07/2007
<i>Melanitta nigra</i>	Common Scoter	1	SH3393	Cemlyn	43 records - 06/07/1994 - 25/07/2013
<i>Merops apiaster</i>	Bee-eater	1	SH3393	Cemlyn	3 records - 13/06/2010 - 26/05/2012
<i>Milvus milvus</i>	Red Kite	1	SH330932	Cemlyn	24/07/2008
<i>Milvus milvus</i>	Red Kite	1	SH3393	Cemlyn	2 records - 23/04/2006 - 24/05/2009
<i>Motacilla flava subsp. <i>flavissima</i></i>	Yellow Wagtail	1	SH330932	Cemlyn	6 records - 02/05/2002 - July 2008
<i>Motacilla flava subsp. <i>flavissima</i></i>	Yellow Wagtail	1	SH3393	Cemlyn	43 records - 02/05/1994 - 31/07/2011
<i>Muscicapa striata</i>	Spotted Flycatcher	1	SH335935	Cemlyn	2 records - 02/06/2007 - 22/05/2008
<i>Muscicapa striata</i>	Spotted Flycatcher	1	SH3393	Cemlyn	36 records - 06/05/1994 - 25/04/2013
<i>Muscicapa striata</i>	Spotted Flycatcher	1	SH3592	Tregelle	31/07/1999
<i>Muscicapa striata</i>	Spotted Flycatcher	1	SH3793	Cemaes Bay	19/06/2008
<i>Numenius arquata</i>	Curlew	1	SH329917		2005 approx
<i>Numenius arquata</i>	Curlew	1	SH329936	Cemlyn Bay	2 records - 23/09/2004 - 30/09/2004
<i>Numenius arquata</i>	Curlew	1	SH330932	Cemlyn	6 records - May 2002 - 18/07/2008
<i>Numenius arquata</i>	Curlew	1	SH331932	Cemlyn NWWT Reserve	3 records - 26/01/2008 - 18/05/2013
<i>Numenius arquata</i>	Curlew	1	SH333933	Cemlyn Bay	08/06/2006
<i>Numenius arquata</i>	Curlew	1	SH335935	Cemlyn	4 records - 01/10/1999 - 01/01/2008
<i>Numenius arquata</i>	Curlew	1	SH3393	Cemlyn	259 records - May 1994 - 01/08/2013
<i>Numenius phaeopus</i>	Whimbrel	1	SH3293	Cemlyn/Henborth	26/04/2008
<i>Numenius phaeopus</i>	Whimbrel	1	SH329936	Cemlyn Bay	2 records - 07/05/2004 - 24/08/2004
<i>Numenius phaeopus</i>	Whimbrel	1	SH330932	Cemlyn	7 records - 12/05/2002 - 02/05/2008
<i>Numenius phaeopus</i>	Whimbrel	1	SH331932	Cemlyn NWWT Reserve	5 records - 24/04/2008 - 18/05/2013
<i>Numenius phaeopus</i>	Whimbrel	1	SH333933	Cemlyn Bay	4 records - 27/04/2006 - 03/08/2006
<i>Numenius phaeopus</i>	Whimbrel	1	SH335935	Cemlyn	7 records - 30/04/2007 - 03/06/2008
<i>Numenius phaeopus</i>	Whimbrel	1	SH3393	Cemlyn	96 records - May 1994 - 29/04/2013

Scientific Name	Common Name	Importance Category	Grid Reference	Location	Records Summary
<i>Numenius phaeopus</i>	Whimbrel	1	SH3793	Cemaes Bay	04/05/1999
<i>Numenius phaeopus</i>	Whimbrel	1	SH3794	Llanbadrig	27/04/2000
<i>Oceanodroma leucorhoa</i>	Leach's Storm-petrel	1	SH3393	Cemlyn Bay	7 records - 03/10/1999 - 02/10/2005
<i>Oriolus oriolus</i>	Golden Oriole	1	SH3393	Cemlyn	09/06/2007
<i>Pandion haliaetus</i>	Osprey	1	SH3393	Cemlyn	2 records - 02/06/2011 - 26/05/2013
<i>Passer domesticus</i>	House Sparrow	1	SH3294393545	Cemlyn – Car Park (North)	02/06/2012
<i>Passer domesticus</i>	House Sparrow	1	SH303293555	Cemlyn	02/06/2012
<i>Passer domesticus</i>	House Sparrow	1	SH3308892907	Cemlyn	02/06/2012
<i>Passer domesticus</i>	House Sparrow	1	SH330932	Cemlyn	5 records - 2002 - 30/05/2008
<i>Passer domesticus</i>	House Sparrow	1	SH331932	Cemlyn NWWT Reserve	3 records - 26/01/2008 - 18/05/2013
<i>Passer domesticus</i>	House Sparrow	1	SH3393	Cemlyn	298 records - May 1994 - 08/08/2013
<i>Passer montanus</i>	Tree Sparrow	1	SH3393	Cemlyn Bay	2 records - 03/06/1999 - 30/09/2003
<i>Perdix perdix</i>	Grey Partridge	1	SH3393	Cemlyn	8 records - 14/06/1994 - 12/05/2012
<i>Pernis apivorus</i>	Honey-buzzard	1	SH3393	Cemlyn	27/07/2002
<i>Phalaropus lobatus</i>	Red-necked Phalarope	1	SH3393	Cemlyn	2 records - all 08/06/2006
<i>Philomachus pugnax</i>	Ruff	1	SH3302093234	Cemlyn	07/05/2013
<i>Philomachus pugnax</i>	Ruff	1	SH3304493305	Cemlyn	07/05/2013
<i>Philomachus pugnax</i>	Ruff	1	SH330933	Cemlyn; Main island	24/04/2011
<i>Philomachus pugnax</i>	Ruff	1	SH335935	Cemlyn	2 records - 25/12/2006 - 30/01/2007
<i>Phoenicurus ochruros</i>	Black Redstart	1	SH3393	Cemlyn	23 records - May 1994 - 09/05/2011
<i>Platalea leucorodia</i>	Spoonbill	1	SH330932	Cemlyn	8 records - 19/02/1999 - 02/05/2013
<i>Platalea leucorodia</i>	Spoonbill	1	SH3393	Cemlyn	2 records - 10/07/2002 - 04/05/2003
<i>Plectrophenax nivalis</i>	Snow Bunting	1	SH335935	Cemlyn	2 records - 19/06/2000 - 16/05/2009
<i>Plectrophenax nivalis</i>	Snow Bunting	1	SH3393	Cemlyn Bay	25/12/2007
<i>Pluvialis apricaria</i>	Golden Plover	1	SH328934	Cemlyn Bay	20 records - 23/10/1999 - 24/12/2005
<i>Pluvialis apricaria</i>	Golden Plover	1	SH329936	Cemlyn Bay	6 records - 09/01/2003 - 08/12/2003
<i>Pluvialis apricaria</i>	Golden Plover	1	SH3308892907	Cemlyn	4 records - 21/01/2004 - 30/09/2004
<i>Pluvialis apricaria</i>	Golden Plover	1	SH330932	Cemlyn	07/08/2013
<i>Pluvialis apricaria</i>	Golden Plover	1	SH330934	Cemlyn Bay	8 records - 26/04/2002 - 12/07/2008
<i>Pluvialis apricaria</i>	Golden Plover	1	SH330936	Cemlyn Bay	3 records - 03/03/2008 - 27/10/2008
<i>Pluvialis apricaria</i>	Golden Plover	1	SH331932	Cemlyn	2 records - 19/03/2007 - 24/09/2007
<i>Pluvialis apricaria</i>	Golden Plover	1	SH332928	Cemlyn	3 records - 26/01/2008 - 24/04/2008
<i>Pluvialis apricaria</i>	Golden Plover	1	SH333933	Cemlyn Bay	28/10/2000
<i>Pluvialis apricaria</i>	Golden Plover	1	SH335935	Cemlyn	3 records - 27/04/2006 - 03/09/2006
<i>Pluvialis apricaria</i>	Golden Plover	1	SH3393	Cemlyn	7 records - 30/07/2007 - 25/12/2007
<i>Podiceps auritus</i>	Slavonian Grebe	1	SH3349293702	Cemlyn	330 records - 10/05/1994 - 21/06/2013
<i>Podiceps auritus</i>	Slavonian Grebe	1	SH335935	Cemlyn Bay	02/06/2013
<i>Podiceps auritus</i>	Slavonian Grebe	1	SH3393	Cemlyn Bay	25/12/2006
<i>Puffinus mauretanicus</i>	Balearic Shearwater	1	SH3393	Cemlyn	58 records - 07/01/1999 - 12/03/2000
<i>Puffinus mauretanicus</i>	Balearic Shearwater	1	SH3594	Wylfa Head seawatches	8 records - 03/10/1999 - 14/08/2008
<i>Pyrrhocorax pyrrhocorax</i>	Chough	1	SH328934	Cemlyn Bay	3 records - 12/08/2006 - 02/09/2006
<i>Pyrrhocorax pyrrhocorax</i>	Chough	1	SH329936	Cemlyn Bay	25/07/2003
<i>Pyrrhocorax pyrrhocorax</i>	Chough	1	SH330932	Cemlyn	2 records - 30/09/2004 - 25/12/2004
					5 records - 08/06/2002 - June 2008

Scientific Name	Common Name	Importance Category	Grid Reference	Location	Records Summary
<i>Pyrrhocorax pyrrhocorax</i>	Cough	1	SH3314893316	Cemlyn	02/06/2012
<i>Pyrrhocorax pyrrhocorax</i>	Cough	1	SH331928	Cemlyn; Plas Cemlyn	Summer 2011
<i>Pyrrhocorax pyrrhocorax</i>	Cough	1	SH331932	Cemlyn	30/05/2008
<i>Pyrrhocorax pyrrhocorax</i>	Cough	1	SH3321993032	Cemlyn	02/06/2012
<i>Pyrrhocorax pyrrhocorax</i>	Cough	1	SH332939	Cemlyn Bay	15/01/2007
<i>Pyrrhocorax pyrrhocorax</i>	Cough	1	SH3393	Cemlyn	90 records - 18/05/1994 - June 2011
<i>Pyrrhocorax pyrrhocorax</i>	Cough	1	SH3594	Wylfa; Head	4 records - 05/02/2000 - 17/02/2008
<i>Pyrrhocorax pyrrhocorax</i>	Cough	1	SH3794	Llanbadrig	3 records - 10/03/1999 - 05/04/1999
<i>Recurvirostra avosetta</i>	Pied Avocet	1	SH330932	Cemlyn	2 records - 17/05/2008 - 18/05/2008
<i>Recurvirostra avosetta</i>	Pied Avocet	1	SH330935	Cemlyn	18/05/2008
<i>Recurvirostra avosetta</i>	Pied Avocet	1	SH3393	Cemlyn; Lagoon	2 records - 17/05/2008 - 18/05/2008
<i>Regulus ignicapilla</i>	Firecrest	1	SH3393	Cemlyn; In scrub by Bryn Abber	2 records - 31/10/2005 - 02/05/2013
<i>Stercorarius parasiticus</i>	Arctic Skua	1	SH329936	Cemlyn Bay	23/09/2004
<i>Stercorarius parasiticus</i>	Arctic Skua	1	SH330932	Cemlyn	3 records - 15/06/2002 - 2008
<i>Stercorarius parasiticus</i>	Arctic Skua	1	SH333933	Cemlyn Bay	03/06/2006
<i>Stercorarius parasiticus</i>	Arctic Skua	1	SH3393	Cemlyn	47 records - 15/05/1994 - 18/09/2011
<i>Stercorarius parasiticus</i>	Arctic Skua	1	SH3594	Wylfa; Wylfa Head seawatches	5 records - 02/08/2006 - 02/09/2006
<i>Sterna dougallii</i>	Roseate Tern	1	SH329936	Cemlyn Bay	5 records - 12/06/2004 - 02/08/2004
<i>Sterna dougallii</i>	Roseate Tern	1	SH3304493305	Cemlyn	3 records - 23/05/2013 - 27/06/2013
<i>Sterna dougallii</i>	Roseate Tern	1	SH330932	Cemlyn	11 records - 26/05/2002 - 17/06/2008
<i>Sterna dougallii</i>	Roseate Tern	1	SH330933	Cemlyn; Main Island	20/06/2011 - 11/07/2011
<i>Sterna dougallii</i>	Roseate Tern	1	SH332933	Cemlyn	01/07/2008
<i>Sterna dougallii</i>	Roseate Tern	1	SH333933	Cemlyn Bay	2 records - 28/06/2006 - 17/07/2006
<i>Sterna dougallii</i>	Roseate Tern	1	SH335935	Cemlyn	07/06/2007
<i>Sterna dougallii</i>	Roseate Tern	1	SH3393	Cemlyn	103 records - 1994 - 09/07/2011
<i>Sternula albifrons</i>	Little Tern	1	SH330932	Cemlyn	5 records - 31/05/2002 - 05/07/2008
<i>Sternula albifrons</i>	Little Tern	1	SH330933	Cemlyn; Main island	13/05/2011
<i>Sternula albifrons</i>	Little Tern	1	SH3393	Cemlyn	36 records - 21/05/1994 - 25/05/2013
<i>Streptopelia turtur</i>	Turtle Dove	1	SH330932	Cemlyn	28/05/2003
<i>Streptopelia turtur</i>	Turtle Dove	1	SH3393	Cemlyn	3 records - 10/05/1994 - 23/05/2004
<i>Tringa glareola</i>	Wood Sandpiper	1	SH330932	Cemlyn; Small Island	3 records - 16/07/2002 - 06/05/2011
<i>Tringa glareola</i>	Wood Sandpiper	1	SH3393	Cemlyn	6 records - 06/05/1994 - 04/05/2008
<i>Tringa nebularia</i>	Common Greenshank	1	SH328934	Cemlyn Bay	11/08/2003
<i>Tringa nebularia</i>	Common Greenshank	1	SH329936	Cemlyn Bay	21/01/2004
<i>Tringa nebularia</i>	Common Greenshank	1	SH3304493305	Cemlyn	2 records - 07/05/2013 - 12/05/2013
<i>Tringa nebularia</i>	Common Greenshank	1	SH330932	Cemlyn	7 records - May 2002 - August 2003
<i>Tringa nebularia</i>	Common Greenshank	1	SH3393	Cemlyn	56 records - 01/05/1994 - 27/07/2013
<i>Tringa ochropus</i>	Green Sandpiper	1	SH3293	Cemlyn/Henborth	27/07/2004
<i>Tringa ochropus</i>	Green Sandpiper	1	SH329936	Cemlyn Bay	24/08/2004
<i>Tringa ochropus</i>	Green Sandpiper	1	SH330932	Cemlyn	4 records - 04/05/2002 - 05/07/2008
<i>Tringa ochropus</i>	Green Sandpiper	1	SH3393	Cemlyn	13 records - 13/06/1999 - 28/07/2011
<i>Turdus iliacus</i>	Redwing	1	SH331932	Cemlyn	03/01/2008
<i>Turdus iliacus</i>	Redwing	1	SH3393	Cemlyn Bay	39 records - 07/01/1999 - 16/10/2005
<i>Turdus iliacus</i>	Redwing	1	SH3593	Wylfa; Power Station Nature trail	3 records - 16/02/1999 - 23/02/1999

Scientific Name	Common Name	Importance Category	Grid Reference	Location	Records Summary
<i>Turdus iliacus</i>	Redwing	1	SH3691	Llanfechell	16/01/2005
<i>Turdus iliacus</i>	Redwing	1	SH3793	Cemaes Bay; Gadlyns	6 records - 12/10/2000 - 25/12/2008
<i>Turdus pilaris</i>	Fieldfare	1	SH330932	Cemlyn	29/05/2002
<i>Turdus pilaris</i>	Fieldfare	1	SH331932	Cemlyn	03/01/2008
<i>Turdus pilaris</i>	Fieldfare	1	SH3393	Cemlyn Bay	25 records - 07/01/1999 - 16/10/2005
<i>Turdus pilaris</i>	Fieldfare	1	SH3691	Llanfechell	16/01/2005
<i>Turdus pilaris</i>	Fieldfare	1	SH3693	Cemaes Bay	23/03/1999
<i>Turdus pilaris</i>	Fieldfare	1	SH3793	Cemaes Bay; Tae Hen	06/01/2008
<i>Turdus torquatus</i>	Ring Ouzel	1	SH3393	Cemlyn Bay	3 records - 30/03/1999 - 02/04/2005
<i>Turdus torquatus</i>	Ring Ouzel	1	SH3793	Cemaes; Park Lodge	17/02/2008 2005 approx
<i>Tyto alba</i>	Barn Owl	1	SH329917		3 records - 12/07/2002 - 2008
<i>Tyto alba</i>	Barn Owl	1	SH330932	Cemlyn	11/05/2013
<i>Tyto alba</i>	Barn Owl	1	SH331932	Cemlyn NWWT Reserve	12/06/2010
<i>Tyto alba</i>	Barn Owl	1	SH3332292965	Cemlyn	3 records - 14/05/2007 - 07/06/2007
<i>Tyto alba</i>	Barn Owl	1	SH335935	Cemlyn	10 records - 1994 - 24/05/2012
<i>Tyto alba</i>	Barn Owl	1	SH3393	Cemlyn	26/07/2001
<i>Tyto alba</i>	Barn Owl	1	SH343930	Cemlyn; Cafnan Farm	2 records - 17/01/2002 - 17/03/2006
<i>Tyto alba</i>	Barn Owl	1	SH3793	Cemaes Bay	1 record - Spring 1998 – Summer 1998
<i>Tyto alba</i> subsp. <i>guttata</i>	Dark-breasted Barn Owl	1	SH3393	Cemlyn	2005 approx
<i>Vanellus vanellus</i>	Northern Lapwing	1	SH329917		26/12/2004
<i>Vanellus vanellus</i>	Northern Lapwing	1	SH329936	Cemlyn Bay	17 records - 2002 - July 2008
<i>Vanellus vanellus</i>	Northern Lapwing	1	SH330932	Cemlyn	26/01/2008
<i>Vanellus vanellus</i>	Northern Lapwing	1	SH331932	Cemlyn	28/10/2000
<i>Vanellus vanellus</i>	Northern Lapwing	1	SH332928	Cemlyn	2 records - 21/08/2006 - 25/12/2006
<i>Vanellus vanellus</i>	Northern Lapwing	1	SH333933	Cemlyn Bay	3 records - 30/01/2007 - 25/12/2007
<i>Vanellus vanellus</i>	Northern Lapwing	1	SH335935	Cemlyn	06/02/2006
<i>Vanellus vanellus</i>	Northern Lapwing	1	SH336921	Cemlyn Bay	216 records - May 1994 - 22/07/2013
<i>Vanellus vanellus</i>	Northern Lapwing	1	SH3393	Cemlyn	18/02/2002
<i>Vanellus vanellus</i>	Northern Lapwing	1	SH3793	Cemaes	26/04/2008
<i>Actitis hypoleucos</i>	Common Sandpiper	2	SH3293	Cemlyn/Henborth	04/08/2004
<i>Actitis hypoleucos</i>	Common Sandpiper	2	SH329936	Cemlyn Bay	13/05/2013
<i>Actitis hypoleucos</i>	Common Sandpiper	2	SH3302093234	Cemlyn	9 records May 2002 - 05/07/2008
<i>Actitis hypoleucos</i>	Common Sandpiper	2	SH330932	Cemlyn	18/05/2013
<i>Actitis hypoleucos</i>	Common Sandpiper	2	SH331932	Cemlyn NWWT Reserve	21/08/2006
<i>Actitis hypoleucos</i>	Common Sandpiper	2	SH333933	Cemlyn Bay	30/04/2007
<i>Actitis hypoleucos</i>	Common Sandpiper	2	SH335935	Cemlyn	64 records 03/05/1994 - 09/08/2013
<i>Aegithalos caudatus</i>	Long-tailed Tit	2	SH3393	Cemlyn	30/07/2005
<i>Aegithalos caudatus</i>	Long-tailed Tit	2	SH3793	Cemaes Bay	11/11/2008 2005
<i>Alauda arvensis</i>	Sky Lark	2	SH329917		5 records May 2002 - 12/11/2008
<i>Alauda arvensis</i>	Sky Lark	2	SH330932	Cemlyn	32 records 25/05/1994 - 03/08/2013
<i>Alauda arvensis</i>	Sky Lark	2	SH3393	Cemlyn	20/06/2002
<i>Anas clypeata</i>	Northern Shoveler	2	SH330932	Cemlyn	26/01/2008
<i>Anas clypeata</i>	Northern Shoveler	2	SH331932	Cemlyn	

Scientific Name	Common Name	Importance Category	Grid Reference	Location	Records Summary
<i>Anas clypeata</i>	Northern Shoveler	2	SH333933	Cemlyn Bay	3 records 09/01/2003 - 28/06/2006
<i>Anas clypeata</i>	Northern Shoveler	2	SH335935	Cemlyn	25/12/2007
<i>Anas clypeata</i>	Northern Shoveler	2	SH3393	Cemlyn	72 records 23/04/1994 - 23/04/2013
<i>Anas crecca</i>	Teal	2	SH3302093234	Cemlyn	8 records in 2013
<i>Anas crecca</i>	Teal	2	SH330932	Cemlyn	26/07/2008
<i>Anas crecca</i>	Teal	2	SH331932	Cemlyn	26/01/2008
<i>Anas crecca</i>	Teal	2	SH333933	Cemlyn Bay	27/07/2006
<i>Anas crecca</i>	Teal	2	SH333937	Cemlyn Bay	16/08/2004
<i>Anas crecca</i>	Teal	2	SH335935	Cemlyn	02/06/2007
<i>Anas crecca</i>	Teal	2	SH3393	Cemlyn	69 records 02/05/1994 - 28/04/2013
<i>Anas penelope</i>	Wigeon	2	SH328934	Cemlyn Bay	15/03/2003
<i>Anas penelope</i>	Wigeon	2	SH3302093234	Cemlyn	02/08/2013
<i>Anas penelope</i>	Wigeon	2	SH330932	Cemlyn	17/05/2002
<i>Anas penelope</i>	Wigeon	2	SH331932	Cemlyn	12/11/2008
<i>Anas penelope</i>	Wigeon	2	SH333933	Cemlyn Bay	6 records in 2006
<i>Anas penelope</i>	Wigeon	2	SH333937	Cemlyn Bay	4 records in 2004
<i>Anas penelope</i>	Wigeon	2	SH335935	Cemlyn	6 records in 2007
<i>Anas penelope</i>	Wigeon	2	SH3393	Cemlyn	238 records 07/05/1994 - 23/10/2009
<i>Anas penelope</i>	Wigeon	2	SH3793	Cemaes Bay	20/09/2002
<i>Anas platyrhynchos</i>	Mallard	2	SH3293	Cemlyn	6 records in 1996
<i>Anas platyrhynchos</i>	Mallard	2	SH3302093234	Cemlyn	02/06/2012
<i>Anas platyrhynchos</i>	Mallard	2	SH3308892907	Cemlyn	02/06/2012
<i>Anas platyrhynchos</i>	Mallard	2	SH330932	Cemlyn	10 records - 2002 - 03/07/2008
<i>Anas platyrhynchos</i>	Mallard	2	SH331932	Cemlyn NWWT Reserve	4 records 2008 - 2013
<i>Anas platyrhynchos</i>	Mallard	2	SH33579312	Cemlyn Bay	4 record 2003
<i>Anas platyrhynchos</i>	Mallard	2	SH3393	Cemlyn	218 records - May 1994 - 03/06/2012
<i>Anas platyrhynchos</i>	Mallard	2	SH37279354	Anglesey	24/04/2010
<i>Anas platyrhynchos</i>	Mallard	2	SH3793	Cemaes Bay	03/05/2008
<i>Anas strepera</i>	Gadwall	2	SH3302093234	Cemlyn	1 record - 26/04/2013 – 30/04/2013
<i>Anas strepera</i>	Gadwall	2	SH331932	Cemlyn NWWT Reserve	18/05/2013
<i>Anas strepera</i>	Gadwall	2	SH3393	Cemlyn	9 records 06/08/1998 - 22/05/2012
<i>Anser albifrons</i>	Greater White-fronted Goose	2	SH3393	Cemlyn Bay	3 records - 2000
<i>Anthus pratensis</i>	Meadow Pipit	2	SH330932	Cemlyn	8 records 2002 - 28/07/2008
<i>Anthus pratensis</i>	Meadow Pipit	2	SH3311193874	Cemlyn	02/06/2012
<i>Anthus pratensis</i>	Meadow Pipit	2	SH331932	Cemlyn NWWT Reserve	18/05/2013
<i>Anthus pratensis</i>	Meadow Pipit	2	SH331932	Cemlyn	26/01/2008
<i>Anthus pratensis</i>	Meadow Pipit	2	SH3393	Cemlyn	100 records - June 1994 - 28/04/2012
<i>Anthus pratensis</i>	Meadow Pipit	2	SH3793	Cemaes Bay	18/03/2005
<i>Apus apus</i>	Common Swift	2	SH3294393545	Cemlyn – Car Park (North)	03/06/2012
<i>Apus apus</i>	Common Swift	2	SH330932	Cemlyn	3 records - 19/06/2002 - 22/07/2008
<i>Apus apus</i>	Common Swift	2	SH331932	Cemlyn NWWT Reserve	18/05/2013
<i>Apus apus</i>	Common Swift	2	SH333933	Cemlyn Bay	27/04/2006
<i>Apus apus</i>	Common Swift	2	SH3393	Cemlyn	42 records - 07/05/1994 - 16/05/2013
<i>Apus apus</i>	Common Swift	2	SH3793	Cemaes Bay	10 records 05/05/1999 - 28/07/2008

Scientific Name	Common Name	Importance Category	Grid Reference	Location	Records Summary
<i>Arenaria interpres</i>	Turnstone	2	SH30932	Cemlyn	6 records - 30/04/2002 - 30/05/2008
<i>Arenaria interpres</i>	Turnstone	2	SH3317493825	Cemlyn	02/06/2012
<i>Arenaria interpres</i>	Turnstone	2	SH331932	Cemlyn NWWT Reserve	6 records - 03/01/2008 - 18/05/2013
<i>Arenaria interpres</i>	Turnstone	2	SH333933	Cemlyn Bay	4 records - 29/04/2006 - 25/12/2006
<i>Arenaria interpres</i>	Turnstone	2	SH333937	Cemlyn Bay	5 records - 02/08/2004 - 30/09/2004
<i>Arenaria interpres</i>	Turnstone	2	SH335935	Cemlyn	6 records - 30/01/2007 - 25/12/2007
<i>Arenaria interpres</i>	Turnstone	2	SH3393	Cemlyn	177 records - May 1994 - 26/07/2013
<i>Arenaria interpres</i>	Turnstone	2	SH3793	Cemaes Bay	3 records - 28/02/2008 - 26/12/2008
<i>Asio flammeus</i>	Short-eared Owl	2	SH30932	Cemlyn	2008
<i>Asio flammeus</i>	Short-eared Owl	2	SH332928	Cemlyn Bay	22/06/2000
<i>Asio flammeus</i>	Short-eared Owl	2	SH3393	Cemlyn	15 records - 03/05/1995 - 11/06/2009
<i>Aythya ferina</i>	Pochard	2	SH3293	Cemlyn	22/07/1996
<i>Aythya ferina</i>	Pochard	2	SH3393	Cemlyn	6 records - 24/05/1994 - 27/04/2010
<i>Aythya fuligula</i>	Tufted Duck	2	SH3293	Cemlyn	2 records - 17/05/1996 - 03/07/1996
<i>Aythya fuligula</i>	Tufted Duck	2	SH3302093234	Cemlyn	3 records - 05/07/2013 - 28/07/2013
<i>Aythya fuligula</i>	Tufted Duck	2	SH330932	Cemlyn	2 records - 10/06/2002 - 08/07/2003
<i>Aythya fuligula</i>	Tufted Duck	2	SH3393	Cemlyn	39 records - 03/08/1991 - 01/08/2011
<i>Branta bernicla</i>	Brent Goose	2	SH3293	Cemlyn	25/05/1996
<i>Branta bernicla</i>	Brent Goose	2	SH3393	Cemlyn	3 records - 01/07/1998 - 24/04/2012
<i>Branta bernicla</i> subsp. <i>hrota</i>	Pale-Breasted Brent Goose	2	SH30932	Cemlyn	1 record - 03/06/2008 - 07/06/2008
<i>Branta bernicla</i> subsp. <i>hrota</i>	Pale-Breasted Brent Goose	2	SH330933	Cemlyn Bay	28/04/2008
<i>Branta bernicla</i> subsp. <i>hrota</i>	Pale-Breasted Brent Goose	2	SH331932	Cemlyn	04/06/2008
<i>Branta bernicla</i> subsp. <i>hrota</i>	Pale-Breasted Brent Goose	2	SH3393	Cemlyn	6 records - 02/11/1999 - 03/06/2008
<i>Branta leucopsis</i>	Barnacle Goose	2	SH3393	Cemlyn	2 records - 06/05/1997 - 27/04/1998
<i>Calidris alba</i>	Sanderling	2	SH30932	Cemlyn	16 records - 12/05/2002 - 17/07/2008
<i>Calidris alba</i>	Sanderling	2	SH3317493825	Cemlyn – Compartment 64	3 records - all 02/06/2012
<i>Calidris alba</i>	Sanderling	2	SH331932	Cemlyn NWWT Reserve	3 records - 11/05/2013 - 18/05/2013
<i>Calidris alba</i>	Sanderling	2	SH332934	Cemlyn	23/05/2000
<i>Calidris alba</i>	Sanderling	2	SH333937	Cemlyn Bay	18/09/2004
<i>Calidris alba</i>	Sanderling	2	SH335935	Cemlyn	25/12/2008
<i>Calidris alba</i>	Sanderling	2	SH3393	Cemlyn	67 records - May 1994 - 05/07/2013
<i>Calidris alpina</i>	Dunlin	2	SH3302093234	Cemlyn	03/06/2012
<i>Calidris alpina</i>	Dunlin	2	SH3304493305	Cemlyn	02/06/2012
<i>Calidris alpina</i>	Dunlin	2	SH330932	Cemlyn	10 records - 2002-17/07/2008
<i>Calidris alpina</i>	Dunlin	2	SH3317493825	Cemlyn	02/06/2012
<i>Calidris alpina</i>	Dunlin	2	SH331932	Cemlyn NWWT Reserve	7 records - 26/01/2008 - 18/05/2013
<i>Calidris alpina</i>	Dunlin	2	SH333933	Cemlyn Bay	2 records - 29/04/2006 - 23/05/2006
<i>Calidris alpina</i>	Dunlin	2	SH335935	Cemlyn	3 records - 14/05/2007 - 23/11/2007
<i>Calidris alpina</i>	Dunlin	2	SH3393	Cemlyn	198 records - May 1994 - 28/07/2013
<i>Calidris alpina</i> subsp. <i>schinzii</i>	<i>Calidris alpina</i> subsp. <i>schinzii</i>	2	SH3393	Cemlyn	Jun-10
<i>Calidris canutus</i>	Knot	2	SH30932	Cemlyn	5 records - 17/05/2002 - 24/07/2008
<i>Calidris canutus</i>	Knot	2	SH331932	Cemlyn NWWT Reserve	3 records - 03/01/2008 - 18/05/2013
<i>Calidris canutus</i>	Knot	2	SH333933	Cemlyn Bay	21/08/2006
<i>Calidris canutus</i>	Knot	2	SH335935	Cemlyn Bay	13/09/2007

Scientific Name	Common Name	Importance Category	Grid Reference	Location	Records Summary
<i>Calidris canutus</i>	Knot	2	SH3393	Cemlyn	58 records - 09/05/1994 - 27/07/2013
<i>Carduelis cannabina</i>	Linnet	2	SH3294393545	Cemlyn – Car Park (North)	02/06/2012
<i>Carduelis cannabina</i>	Linnet	2	SH3308892907	Cemlyn	02/06/2012
<i>Carduelis cannabina</i>	Linnet	2	SH330932	Cemlyn	6 records - 02/07/2002 - July 2008
<i>Carduelis cannabina</i>	Linnet	2	SH331932	Cemlyn NWWT Reserve	5 records - 03/01/2008 - 18/05/2013
<i>Carduelis cannabina</i>	Linnet	2	SH335935	Cemlyn	09/04/2008
<i>Carduelis cannabina</i>	Linnet	2	SH3393	Cemlyn	54 records - May 1994 - 29/04/2013
<i>Carduelis cannabina</i>	Twite	2	SH329936	Cemlyn Bay	05/11/2000
<i>Carduelis flavirostris</i>	Twite	2	SH3393	Cemlyn Bay	5 records - 27/06/1996 - 03/11/2000
<i>Carduelis flavirostris</i>	Black Guillermot	2	SH330932	Cemlyn	7 records - 25/05/2002 - 2008
<i>Cephus grylle</i>	Black Guillermot	2	SH331932	Cemlyn NWWT Reserve	11/05/2013
<i>Cephus grylle</i>	Black Guillermot	2	SH3349293702	Cemlyn	02/06/2012
<i>Cephus grylle</i>	Black Guillermot	2	SH3393	Cemlyn; Bay area	20 records - 06/07/1994 - 03/06/2012
<i>Corvus cornix</i>	Hooded Crow	2	SH331934	SSSI: Cemlyn Bay	Winter 1995
<i>Corvus cornix</i>	Hooded Crow	2	SH3393	Cemlyn	12 records - 10/05/1994 - 26/05/2013
<i>Corvus cornix</i> subsp. <i>cornix</i>	Hooded Crow	2	SH331934	SSSI: Cemlyn Bay	Summer 1997
<i>Corvus cornix</i> subsp. <i>cornix</i>	Hooded Crow	2	SH3393	Cemlyn	29/04/2007
<i>Cygnus olor</i>	Mute Swan	2	SH3293	Cemlyn	2 records - 09/05/1996 - Summer 1996
<i>Cygnus olor</i>	Mute Swan	2	SH330932	Cemlyn	8 records - 2002 - 21/05/2008
<i>Cygnus olor</i>	Mute Swan	2	SH331932	Cemlyn NWWT Reserve	3 records - 11/05/2013 - 18/05/2013
<i>Cygnus olor</i>	Mute Swan	2	SH335925	Cemlyn Bay	Jun-06
<i>Cygnus olor</i>	Mute Swan	2	SH3393	Cemlyn	91 records - May 1994 - 03/06/2012
<i>Cygnus olor</i>	Mute Swan	2	SH3592	Tregele	07/03/2008
<i>Delichon urbicum</i>	House Martin	2	SH3294393545	Cemlyn – Car Park (North)	02/06/2012
<i>Delichon urbicum</i>	House Martin	2	SH330932	Cemlyn	3 records - 2002 - 23/05/2008
<i>Delichon urbicum</i>	House Martin	2	SH331932	Cemlyn NWWT Reserve	2 records - all 18/05/2013
<i>Delichon urbicum</i>	House Martin	2	SH333933	Cemlyn Bay	27/04/2006
<i>Delichon urbicum</i>	House Martin	2	SH335935	Cemlyn	09/04/2008
<i>Delichon urbicum</i>	House Martin	2	SH337928	Cemlyn	2011
<i>Delichon urbicum</i>	House Martin	2	SH3393	Cemlyn	44 records - 06/05/1994 - 17/05/2012
<i>Fratercula arctica</i>	Puffin	2	SH330932	Cemlyn	6 records - 13/05/2002 - 2008
<i>Fratercula arctica</i>	Puffin	2	SH3349293702	Cemlyn	04/05/2013
<i>Fratercula arctica</i>	Puffin	2	SH3393	Cemlyn	22 records - 28/06/1994 - 08/08/2010
<i>Fratercula arctica</i>	Puffin	2	SH3394	Cemlyn; Off headland	2011
<i>Gallinago gallinago</i>	Common Snipe	2	SH330932	Cemlyn	26/07/2008
<i>Gallinago gallinago</i>	Common Snipe	2	SH331932	Cemlyn	26/01/2008
<i>Gallinago gallinago</i>	Common Snipe	2	SH335935	Cemlyn	2 records - 30/01/2007 - 19/07/2007
<i>Gallinago gallinago</i>	Common Snipe	2	SH3393	Cemlyn	67 records - 25/04/1994 - 28/07/2013
<i>Haematopus ostralegus</i>	Oystercatcher	2	SH3293993356	Cemlyn	02/06/2012
<i>Haematopus ostralegus</i>	Oystercatcher	2	SH329934	Cemlyn; Bryn Aber and the Weir	2011
<i>Haematopus ostralegus</i>	Oystercatcher	2	SH3302093234	Cemlyn	4 records - 02/06/2012 - 26/04/2013
<i>Haematopus ostralegus</i>	Oystercatcher	2	SH3303293555	Cemlyn	02/06/2012
<i>Haematopus ostralegus</i>	Oystercatcher	2	SH330932	Cemlyn; Small Island	17 records - 2002 - 17/05/2011
<i>Haematopus ostralegus</i>	Oystercatcher	2	SH330933	Cemlyn; Main Island	2011

Scientific Name	Common Name	Importance	Grid Category	Reference	Location	Records Summary
<i>Haematopus ostralegus</i>	Oystercatcher	2	SH3317493825	Cemlyn	02/06/2012	
<i>Haematopus ostralegus</i>	Oystercatcher	2	SH331932	Cemlyn NWWT Reserve	5 records - 26/01/2008 - 18/05/2013	
<i>Haematopus ostralegus</i>	Oystercatcher	2	SH332932	Cemlyn; Ridge	22/05/2011	
<i>Haematopus ostralegus</i>	Oystercatcher	2	SH33579312	Cemlyn Bay	2 records - November 2003 - 15/11/2003	
<i>Haematopus ostralegus</i>	Oystercatcher	2	SH3393	Cemlyn	154 records - May 1994 - 03/06/2012	
<i>Haematopus ostralegus</i>	Oystercatcher	2	SH3793	Cemaes	2 records - 07/03/1999 - 09/07/2000	
<i>Hirundo rustica</i>	Swallow	2	SH3302093234	Cemlyn	02/06/2012	
<i>Hirundo rustica</i>	Swallow	2	SH3303293555	Cemlyn	02/06/2012	
<i>Hirundo rustica</i>	Swallow	2	SH330932	Cemlyn	8 records - 11/05/2002 - 2008	
<i>Hirundo rustica</i>	Swallow	2	SH331932	Cemlyn NWWT Reserve	4 records - 12/11/2008 - 18/05/2013	
<i>Hirundo rustica</i>	Swallow	2	SH333933	Cemlyn Bay	27/04/2006	
<i>Hirundo rustica</i>	Swallow	2	SH335935	Cemlyn	2 records - 04/04/2007 - 09/04/2008	
<i>Hirundo rustica</i>	Swallow	2	SH3393	Cemlyn	87 records - May 1994 - 08/08/2013	
<i>Hirundo rustica</i>	Swallow	2	SH3592	Tregle	05/04/1999	
<i>Hirundo rustica</i>	Swallow	2	SH3793	Cemaes Bay	19/04/2005	
<i>Hydrobates pelagicus</i>	Storm-petrel	2	SH3293	Cemlyn	2 records - 29/06/1996 - 01/07/1996	
<i>Hydrobates pelagicus</i>	Storm-petrel	2	SH329936	Cemlyn Bay	03/07/2004	
<i>Hydrobates pelagicus</i>	Storm-petrel	2	SH330932	Cemlyn	3 records - 14/05/2002 - 2008	
<i>Hydrobates pelagicus</i>	Storm-petrel	2	SH3393	Cemlyn	13 records - 10/07/2000 - 14/06/2010	
<i>Hydrobates pelagicus</i>	Storm-petrel	2	SH3594	Wylfa; Wylfa Head seawatches	2 records - 02/08/2006 - 28/08/2006	
<i>Larus argentatus</i>	Herring Gull	2	SH330932	Cemlyn	6 records - 2002 - 2008	
<i>Larus argentatus</i>	Herring Gull	2	SH331932	Cemlyn NWWT Reserve	4 records - 26/01/2008 - 18/05/2013	
<i>Larus argentatus</i>	Herring Gull	2	SH3393	Cemlyn	33 records - May 1994 - 08/08/2013	
<i>Larus argentatus</i>	Herring Gull	2	SH3592	Tregle	18/02/2002	
<i>Larus argentatus</i>	Herring Gull	2	SH37299354	Anglesey	24/04/2010	
<i>Larus canus</i>	Common Gull	2	SH3304493305	Cemlyn	7 records - 23/04/2013 - 15/05/2013	
<i>Larus canus</i>	Common Gull	2	SH330932	Cemlyn	8 records - May 2002 - 01/07/2008	
<i>Larus canus</i>	Common Gull	2	SH331932	Cemlyn	26/01/2008	
<i>Larus canus</i>	Common Gull	2	SH335935	Cemlyn	21/03/2007	
<i>Larus canus</i>	Common Gull	2	SH3393	Cemlyn	28 records - 05/06/1995 - 17/05/2013	
<i>Larus canus</i>	Common Gull	2	SH3592	Tregle	18/02/2002	
<i>Larus fuscus</i>	Lesser Black-backed Gull	2	SH3302093234	Cemlyn	02/06/2012	
<i>Larus fuscus</i>	Lesser Black-backed Gull	2	SH330932	Cemlyn	5 records - 2002 - 12/05/2008	
<i>Larus fuscus</i>	Lesser Black-backed Gull	2	SH331932	Cemlyn NWWT Reserve	2 records - 26/01/2008 - 18/05/2013	
<i>Larus fuscus</i>	Lesser Black-backed Gull	2	SH3393	Cemlyn	25 records - 05/05/1994 - 08/08/2013	
<i>Larus marinus</i>	Great Black-backed Gull	2	SH3303293555	Cemlyn	02/06/2012	
<i>Larus marinus</i>	Great Black-backed Gull	2	SH330932	Cemlyn	5 records - 2002-2008	
<i>Larus marinus</i>	Great Black-backed Gull	2	SH331932	Cemlyn NWWT Reserve	6 records - 03/01/2008 - 18/05/2013	
<i>Larus marinus</i>	Great Black-backed Gull	2	SH3393	Cemlyn	27 records - May 1994 - 08/08/2013	
<i>Lymnocryptes minimus</i>	Jack Snipe	2	SH3393	Cemlyn Bay	3 records - 17/01/2002 - 24/12/2005	
<i>Mergus serrator</i>	Red-breasted Merganser	2	SH3293	Cemlyn	3 records - May 1996 - July 1996	
<i>Mergus serrator</i>	Red-breasted Merganser	2	SH3302093234	Cemlyn	4 records - 02/06/2012 - 09/08/2013	
<i>Mergus serrator</i>	Red-breasted Merganser	2	SH330932	Cemlyn	12 records - 2002 - 12/07/2008	
<i>Mergus serrator</i>	Red-breasted Merganser	2	SH3317493825	Cemlyn	02/06/2012	

Scientific Name	Common Name	Importance Category	Grid Reference	Location	Records Summary
<i>Mergus serrator</i>	Red-breasted Merganser	2	SH331932	Cemlyn NWWT Reserve	5 records - 23/01/2008 - 18/05/2013
<i>Mergus serrator</i>	Red-breasted Merganser	2	SH333933	Cemlyn Bay	2 records - 27/07/2006 - 21/08/2006
<i>Mergus serrator</i>	Red-breasted Merganser	2	SH3349293702	Cemlyn	2 records - all 02/06/2012
<i>Mergus serrator</i>	Red-breasted Merganser	2	SH335935	Cemlyn	2 records - 30/04/2007 - 14/05/2007
<i>Mergus serrator</i>	Red-breasted Merganser	2	SH3393	Cemlyn	147 records - 06/06/1994 - 03/06/2012
<i>Mergus serrator</i>	Red-breasted Merganser	2	SH3793	Cemaes Bay	05/04/1999
<i>Morus bassanus</i>	Northern Gannet	2	SH3293	Cemlyn	2 records - Spring 1996 - Summer 1996
<i>Morus bassanus</i>	Northern Gannet	2	SH330932	Cemlyn	5 records - 03/06/2002 - 12/07/2008
<i>Morus bassanus</i>	Northern Gannet	2	SH331932	Cemlyn NWWT Reserve	4 records - 11/05/2013 - 18/05/2013
<i>Morus bassanus</i>	Northern Gannet	2	SH333933	Cemlyn Bay	27/04/2006
<i>Morus bassanus</i>	Northern Gannet	2	SH3393	Cemlyn	80 records - 27/08/1994 - 23/06/2013
<i>Oenanthe oenanthe</i>	Northern Wheatear	2	SH330932	Cemlyn	7 records - 02/05/2002 - 03/05/2008
<i>Oenanthe oenanthe</i>	Northern Wheatear	2	SH3311193874	Cemlyn	02/06/2012
<i>Oenanthe oenanthe</i>	Northern Wheatear	2	SH331932	Cemlyn NWWT Reserve	4 records - 11/05/2013 - 18/05/2013
<i>Oenanthe oenanthe</i>	Northern Wheatear	2	SH333933	Cemlyn Bay	27/04/2006
<i>Oenanthe oenanthe</i>	Northern Wheatear	2	SH333937	Cemlyn Bay	4 records - 17/03/2004 - 30/09/2004
<i>Oenanthe oenanthe</i>	Northern Wheatear	2	SH335935	Cemlyn	4 records - 21/03/2007 - 09/04/2008
<i>Oenanthe oenanthe</i>	Northern Wheatear	2	SH3393	Cemlyn	104 records - 02/05/1994 - 07/05/2013
<i>Oenanthe oenanthe subsp. leucorhoa</i>	Greenland Wheatear	2	SH3393	Cemlyn; Tyn Llan Track	01/05/1994
<i>Periparus ater</i>	Coal Tit	2	SH331928	Cemlyn; Plas Cemlyn	2 records - 18/06/2011 - 20/06/2011
<i>Periparus ater</i>	Coal Tit	2	SH3393	Cemlyn Bay	8 records - 21/06/1995 - 03/11/2000
<i>Periparus ater</i>	Coal Tit	2	SH3793	Cemaes Bay	2 records - 04/10/2005 - 29/10/2008
<i>Phalacrocorax carbo</i>	Great Cormorant	2	SH3293	Cemlyn	Spring 1996 - Summer 1996
<i>Phalacrocorax carbo</i>	Great Cormorant	2	SH3302093234	Cemlyn	24/04/2013 - 08/08/2013
<i>Phalacrocorax carbo</i>	Great Cormorant	2	SH330932	Cemlyn	3 records - 05/08/2002 - 08/06/2008
<i>Phalacrocorax carbo</i>	Great Cormorant	2	SH331932	Cemlyn NWWT Reserve	6 records - 03/01/2008 - 18/05/2013
<i>Phalacrocorax carbo</i>	Great Cormorant	2	SH3393	Cemlyn	131 records - 26/08/1994 - 03/06/2012
<i>Phoenicurus phoenicurus</i>	Common Redstart	2	SH3393	Cemlyn	3 records - 12/10/2005 - 11/05/2013
<i>Phylloscopus trochilus</i>	Willow Warbler	2	SH330932	Cemlyn	6 records - 2002 - 26/07/2008
<i>Phylloscopus trochilus</i>	Willow Warbler	2	SH331932	Cemlyn NWWT Reserve	2 records - all 18/05/2013
<i>Phylloscopus trochilus</i>	Willow Warbler	2	SH333933	Cemlyn Bay	27/04/2006
<i>Phylloscopus trochilus</i>	Willow Warbler	2	SH3393	Cemlyn	63 records - May 1994 - 28/04/2013
<i>Phylloscopus trochilus</i>	Willow Warbler	2	SH3693	Cemaes Bay	29/03/1999
<i>Pluvialis squatarola</i>	Grey Plover	2	SH329936	Cemlyn Bay	3 records - 21/01/2004 - 25/12/2004
<i>Pluvialis squatarola</i>	Grey Plover	2	SH330932	Cemlyn	5 records - 30/04/2002 - June 2003
<i>Pluvialis squatarola</i>	Grey Plover	2	SH330933	Cemlyn Bay	2 records - 15/01/2007 - 17/12/2007
<i>Pluvialis squatarola</i>	Grey Plover	2	SH331932	Cemlyn NWWT Reserve	4 records - 26/01/2008 - 18/05/2013
<i>Pluvialis squatarola</i>	Grey Plover	2	SH332928	Cemlyn	3 records - 05/10/2000 - 07/12/2000
<i>Pluvialis squatarola</i>	Grey Plover	2	SH333933	Cemlyn Bay	29/04/2006
<i>Pluvialis squatarola</i>	Grey Plover	2	SH333942	Cemlyn	25/12/2000
<i>Pluvialis squatarola</i>	Grey Plover	2	SH335935	Cemlyn	10 records - 25/12/2006 - 25/12/2008
<i>Pluvialis squatarola</i>	Grey Plover	2	SH3393	Cemlyn	106 records - 14/05/1994 - 18/05/2013
<i>Podiceps grisegena</i>	Red-necked Grebe	2	SH3393	Cemlyn Bay	4 records - 30/01/1999 - 28/03/1999
<i>Puffinus griseus</i>	Sooty Shearwater	2	SH3293	Cemlyn	2 records - 26/06/1996 - 13/07/1996

Scientific Name	Common Name	Importance	Grid Category	Reference	Location	Records Summary
<i>Puffinus griseus</i>	Sooty Shearwater	2	SH32940	SSSI: Cemlyn Bay; Headland	Cemlyn	Dec-01
<i>Puffinus griseus</i>	Sooty Shearwater	2	SH333933		Cemlyn Bay	21/08/2006
<i>Puffinus griseus</i>	Sooty Shearwater	2	SH3393		Cemlyn	9 records - 07/07/1995 - 14/08/2008
<i>Puffinus griseus</i>	Sooty Shearwater	2	SH3594		Wylfa; Wylfa Head seawatches	2 records - 02/08/2006 - 02/09/2006
<i>Puffinus puffinus</i>	Manx Shearwater	2	SH3293		Cemlyn	1 record - Spring 1996 – Summer 1996
<i>Puffinus puffinus</i>	Manx Shearwater	2	SH330930		Cemlyn	29/04/2008
<i>Puffinus puffinus</i>	Manx Shearwater	2	SH330932		Cemlyn	6 records - 2002 - 17/07/2008
<i>Puffinus puffinus</i>	Manx Shearwater	2	SH331932		Cemlyn NWWT Reserve	3 records - 11/05/2013 - 18/05/2013
<i>Puffinus puffinus</i>	Manx Shearwater	2	SH333933		Cemlyn Bay	6 records - 27/04/2006 - 03/08/2006
<i>Puffinus puffinus</i>	Manx Shearwater	2	SH335935		Cemlyn	30/07/2007
<i>Puffinus puffinus</i>	Manx Shearwater	2	SH3393		Cemlyn	60 records - May 1994 - 21/05/2013
<i>Puffinus puffinus</i>	Manx Shearwater	2	SH3594		Wylfa; Wylfa Head seawatches	4 records - 12/08/2006 - 02/09/2006
<i>Pyrhula pyrrhula</i>	Common Bullfinch	2	SH3393		Cemaes Bay	23/06/1999
<i>Pyrhula pyrrhula</i>	Common Bullfinch	2	SH3592		Cemlyn	40 records - 05/05/1998 - 11/07/2009
<i>Pyrhula pyrrhula</i>	Common Bullfinch	2	SH3594		Tregele	25/11/2002
<i>Pyrhula pyrrhula</i>	Common Bullfinch	2	SH3693		Wylfa	3 records - 23/03/2000 - 14/05/2002
<i>Pyrhula pyrrhula</i>	Common Bullfinch	2	SH3793		Cemaes Bay	17/08/1999
<i>Regulus regulus</i>	Goldcrest	2	SH3393		Cemlyn	10 records - 12/01/2002 - 27/12/2008
<i>Riparia riparia</i>	Sand Martin	2	SH330932		Cemlyn	21 records - 28/04/1998 - 05/08/2010
<i>Riparia riparia</i>	Sand Martin	2	SH331932		NWWT Reserve	4 records - 04/05/2002 - 25/07/2008
<i>Riparia riparia</i>	Sand Martin	2	SH333933		Cemlyn Bay	3 records - 11/05/2013 - 18/05/2013
<i>Riparia riparia</i>	Sand Martin	2	SH335935		Cemlyn	4 records - 27/04/2006 - 03/08/2006
<i>Riparia riparia</i>	Sand Martin	2	SH3393		Cemlyn	3 records - 04/04/2007 - 09/04/2008
<i>Riparia riparia</i>	Sand Martin	2	SH3594		Wylfa	71 records - 1994 - 28/06/2013
<i>Riparia riparia</i>	Sand Martin	2	SH3793		Cemaes Bay	22/03/2000
<i>Scolopax rusticola</i>	Woodcock	2	SH329917			05/04/2002
<i>Scolopax rusticola</i>	Woodcock	2	SH3393		Cemlyn	2005 approx
<i>Scolopax rusticola</i>	Woodcock	2	SH3793		Cemaes Bay	01/01/2008
<i>Somateria mollissima</i>	Common Eider	2	SH329936		Cemlyn Bay	29/01/1999
<i>Somateria mollissima</i>	Common Eider	2	SH3393			01/05/2004
<i>Stercorarius longicaudus</i>	Long-tailed Skua	2	SH330932		Cemlyn	13 records - 14/06/1994 - 15/05/2013
<i>Stercorarius longicaudus</i>	Long-tailed Skua	2	SH3594		Wylfa; Wylfa Head seawatches	2008
<i>Sterna hirundo</i>	Common Tern	2	SH3302093234		Cemlyn	12/08/2006
<i>Sterna hirundo</i>	Common Tern	2	SH3304493305		Cemlyn	02/06/2012
<i>Sterna hirundo</i>	Common Tern	2	SH33069330	SSSI: Cemlyn Bay; Islands	Cemlyn	02/06/2012
<i>Sterna hirundo</i>	Common Tern	2	SH330932		1996	20 records - 2002 - 2008
<i>Sterna hirundo</i>	Common Tern	2	SH33149324		Cemlyn	18/05/2011
<i>Sterna hirundo</i>	Common Tern	2	SH331934		Cemlyn Bay Nature Reserve	18/05/2011
<i>Sterna hirundo</i>	Common Tern	2	SH335935		Cemlyn Lagoon 1	2000
<i>Sterna hirundo</i>	Common Tern	2	SH3393		Cemlyn	30/04/2007
<i>Sterna paradisaea</i>	Arctic Tern	2	SH329936		Cemlyn Bay	65 records - 1994 - 24/04/2012
<i>Sterna paradisaea</i>	Arctic Tern	2	SH3302093234		Cemlyn	01/05/2004
<i>Sterna paradisaea</i>	Arctic Tern	2	SH3304493305		Cemlyn	02/06/2012

Scientific Name	Common Name	Importance	Grid Category	Reference	Location	Records Summary
<i>Sterna paradisaea</i>	Arctic Tern	2	SH33069330	SSSI: Cemlyn Bay; Islands	1996	
<i>Sterna paradisaea</i>	Arctic Tern	2	SH330930	Cemlyn	29/04/2008	
<i>Sterna paradisaea</i>	Arctic Tern	2	SH330932	Cemlyn	11 records - 2002 - 2008	
<i>Sterna paradisaea</i>	Arctic Tern	2	SH33149324	Cemlyn Bay Nature Reserve	18/05/2011	
<i>Sterna paradisaea</i>	Arctic Tern	2	SH331934	Cemlyn Lagoon 1	2000	
<i>Sterna paradisaea</i>	Arctic Tern	2	SH332934	Cemlyn Bay	25/04/2000	
<i>Sterna paradisaea</i>	Arctic Tern	2	SH333933	Cemlyn Bay	2 records - 27/04/2006 - 29/04/2006	
<i>Sterna paradisaea</i>	Arctic Tern	2	SH3349293702	Cemlyn	02/06/2012	
<i>Sterna paradisaea</i>	Arctic Tern	2	SH335935	Cemlyn Bay	30/04/2007	
<i>Sterna paradisaea</i>	Arctic Tern	2	SH3393	Cemlyn	61 records - 1994 - 14/05/2011	
<i>Sterna sandvicensis</i>	Sandwich Tern	2	SH328934	Cemlyn Bay	10/04/2003	
<i>Sterna sandvicensis</i>	Sandwich Tern	2	SH3302093234	Cemlyn	02/06/2012	
<i>Sterna sandvicensis</i>	Sandwich Tern	2	SH3304493305	Cemlyn	3 records - 02/06/2012 - June 2013	
<i>Sterna sandvicensis</i>	Sandwich Tern	2	SH33069330	SSSI: Cemlyn Bay; Islands	1996	
<i>Sterna sandvicensis</i>	Sandwich Tern	2	SH330932	Cemlyn	13 records - 2002 - 2008	
<i>Sterna sandvicensis</i>	Sandwich Tern	2	SH331932	Cemlyn NWWT Reserve	5 records - 24/04/2008 - 18/05/2013	
<i>Sterna sandvicensis</i>	Sandwich Tern	2	SH331934	Cemlyn Lagoon 1	2000	
<i>Sterna sandvicensis</i>	Sandwich Tern	2	SH333933	Cemlyn; Bay	2 records - 27/04/2006 - 01/06/2011	
<i>Sterna sandvicensis</i>	Sandwich Tern	2	SH335935	Cemlyn	2 records - 04/04/2007 - 09/04/2008	
<i>Sterna sandvicensis</i>	Sandwich Tern	2	SH3393	Cemlyn	123 records - 1994 - 23/04/2012	
<i>Sturnus vulgaris</i>	Common Starling	2	SH330932	Cemlyn	4 records - 29/06/2002 - 28/06/2008	
<i>Sturnus vulgaris</i>	Common Starling	2	SH3393	Cemlyn	192 records - May 1994 - 08/07/2013	
<i>Sturnus vulgaris</i>	Common Starling	2	SH3593	Wylfa; Power Station Nature trail	5 records - 14/02/1999 - 03/03/1999	
<i>Sturnus vulgaris</i>	Common Starling	2	SH3691	Llanfachell	05/11/2004	
<i>Sylvia borin</i>	Garden Warbler	2	SH3393	Cemlyn; Along coastal path	3 records - 06/05/2006 - 05/08/2011	
<i>Sylvia borin</i>	Garden Warbler	2	SH343932	Cemlyn Bay	15/05/2003	
<i>Sylvia borin</i>	Garden Warbler	2	SH3594	Wylfa	11/10/2002	
<i>Sylvia communis</i>	Common Whitethroat	2	SH3282692991	Cemlyn	02/06/2012	
<i>Sylvia communis</i>	Common Whitethroat	2	SH3302093234	Cemlyn	02/06/2012	
<i>Sylvia communis</i>	Common Whitethroat	2	SH330932	Cemlyn	6 records - 2002 - 12/07/2008	
<i>Sylvia communis</i>	Common Whitethroat	2	SH331928	Cemlyn; Plas Cemlyn	16/06/2011	
<i>Sylvia communis</i>	Common Whitethroat	2	SH331932	Cemlyn NWWT Reserve	5 records - 24/04/2008 - 18/05/2013	
<i>Sylvia communis</i>	Common Whitethroat	2	SH333933	Cemlyn Bay	2 records - 27/04/2006 - 23/05/2006	
<i>Sylvia communis</i>	Common Whitethroat	2	SH3393	Cemlyn	92 records - May 1994 - 03/06/2012	
<i>Tadorna tadorna</i>	Common Shelduck	2	SH3293	Cemlyn	3 records - Spring 1996 - Summer 1996	
<i>Tadorna tadorna</i>	Common Shelduck	2	SH3294393545	Cemlyn – Car Park (North)	02/06/2012	
<i>Tadorna tadorna</i>	Common Shelduck	2	SH3302093234	Cemlyn	3 records - 02/06/2012 - 03/06/2012	
<i>Tadorna tadorna</i>	Common Shelduck	2	SH330932	Cemlyn	10 records - 10/05/2002 - 2008	
<i>Tadorna tadorna</i>	Common Shelduck	2	SH331932	Cemlyn NWWT Reserve	5 records - 26/01/2008 - 18/05/2013	
<i>Tadorna tadorna</i>	Common Shelduck	2	SH333933	Cemlyn Bay	08/06/2006	
<i>Tadorna tadorna</i>	Common Shelduck	2	SH33579312	Cemlyn Bay	2 records - 2003-15/112003	
<i>Tadorna tadorna</i>	Common Shelduck	2	SH3393	Cemlyn	253 records - 08/05/1994 - 30/04/2013	
<i>Tringa erythropus</i>	Spotted Redshank	2	SH335935	Cemlyn	01/10/2007	
<i>Tringa erythropus</i>	Spotted Redshank	2	SH3393	Cemlyn	4 records - 01/09/1994 - 02/10/2002	

Scientific Name	Common Name	Importance Category	Grid Reference	Location	Records Summary
<i>Tringa totanus</i>	Common Redshank	2	SH3302093234	Cemlyn	2 records - 02/06/2012 - 03/06/2012
<i>Tringa totanus</i>	Common Redshank	2	SH330932	Cemlyn	13 records - 06/05/2002 - 19/07/2008
<i>Tringa totanus</i>	Common Redshank	2	SH3317493825	Cemlyn	02/06/2012
<i>Tringa totanus</i>	Common Redshank	2	SH331932	Cemlyn NWWT Reserve	5 records - 26/01/2008 - 18/05/2013
<i>Tringa totanus</i>	Common Redshank	2	SH3393	Cemlyn	189 records - May 1994 - 23/07/2013
<i>Turdus philomelos</i>	Song Thrush	2	SH330932	Cemlyn	4 records - 2002 - 2008
<i>Turdus philomelos</i>	Song Thrush	2	SH3393	Cemlyn	214 records - 13/08/1994 - June 2011
<i>Turdus philomelos</i>	Song Thrush	2	SH3593	Wylfa; Power Station nature Trail	5 records - 14/02/1999 - 03/03/1999
<i>Uria aalge</i>	Common Guillemot	2	SH330932	Cemlyn	6 records - 08/05/2002 - 28/05/2008
<i>Uria aalge</i>	Common Guillemot	2	SH331932	Cemlyn	3 records - 03/01/2008 - 12/11/2008
<i>Uria aalge</i>	Common Guillemot	2	SH3393	Cemlyn	23 records - 28/06/1994 - 08/08/2010
<i>Accipiter nisus</i>	Sparrowhawk	3	SH3293	Cemlyn	2011
<i>Accipiter nisus</i>	Sparrowhawk	3	SH3293993356	Cemlyn	4 records 02/06/1996 - 24/07/1996
<i>Accipiter nisus</i>	Sparrowhawk	3	SH330932	Cemlyn	02/06/2012
<i>Accipiter nisus</i>	Sparrowhawk	3	SH3346893038	Cemlyn	9 records 05/05/2002 - 18/05/2013
<i>Accipiter nisus</i>	Sparrowhawk	3	SH3393	Cemlyn	02/06/2012
<i>Accipiter nisus</i>	Sparrowhawk	3	SH3592	Tregele	59 records 19/05/1994 - July 2011
<i>Accipiter nisus</i>	Sparrowhawk	3	SH3594	Wylfa	06/12/2008
<i>Accipiter nisus</i>	Sparrowhawk	3	SH3793	Cemaes Bay	15/03/2006
<i>Acrocephalus schoenobaenus</i>	Sedge Warbler	3	SH3293	Cemlyn/Henborth	14 records 09/04/2000 - 24/09/2008
<i>Acrocephalus schoenobaenus</i>	Sedge Warbler	3	SH330932	Cemlyn	27/07/2004
<i>Acrocephalus schoenobaenus</i>	Sedge Warbler	3	SH331932	Cemlyn NWWT Reserve	7 records 2002 - 22/07/2008
<i>Acrocephalus schoenobaenus</i>	Sedge Warbler	3	SH333933	Cemlyn Bay	18/05/2013
<i>Acrocephalus schoenobaenus</i>	Sedge Warbler	3	SH335935	Cemlyn	29/04/2006
<i>Acrocephalus schoenobaenus</i>	Sedge Warbler	3	SH3393	Cemlyn	14/05/2007
<i>Acrocephalus schoenobaenus</i>	Sedge Warbler	3	SH330932	Cemlyn	70 records 1999 - Spring 2011
<i>Acrocephalus scirpaceus</i>	Reed Warbler	3	SH330932	Cemlyn	01/06/2008
<i>Acrocephalus scirpaceus</i>	Wylfa	3	SH3393	Cemlyn	6 records 10/05/1997 - 39/07/2010
<i>Alca torda</i>	Razorbill	3	SH330932	Cemlyn	5 records 26/05/2002 - 26/01/2008
<i>Alca torda</i>	Razorbill	3	SH3393	Cemlyn	19 records 04/06/1994 - 03/06/2012
<i>Alca torda</i>	Razorbill	3	SH3394	Cemlyn; Off shore	2011
<i>Anthus petrosus</i>	Rock Pipit	3	SH330932	Cemlyn	7 records 04/05/2002 - July 2008
<i>Anthus petrosus</i>	Rock Pipit	3	SH3311193874	Cemlyn	12/05/2013
<i>Anthus petrosus</i>	Rock Pipit	3	SH331932	Cemlyn NWWT Reserve	3 records 2005 - 2008
<i>Anthus petrosus</i>	Rock Pipit	3	SH335935	Cemlyn	6 records 2008
<i>Anthus petrosus</i>	Rock Pipit	3	SH3393	Cemlyn	24 records - 13/06/1994 - 29/04/2013
<i>Athene noctua</i>	Little Owl	3	SH332928	Cemlyn Bay	23/06/2000
<i>Athene noctua</i>	Little Owl	3	SH333933	Cemlyn Bay	29/04/2006
<i>Athene noctua</i>	Little Owl	3	SH335935	Cemlyn	4 records - 14/05/2007 - 13/09/2007
<i>Athene noctua</i>	Little Owl	3	SH3393	Cemlyn	35 records - 1994 - 08/08/2010
<i>Athene noctua</i>	Little Owl	3	SH343932	Cafnan, Cemlyn	15/05/2003
<i>Athene noctua</i>	Little Owl	3	SH344931	Cemlyn Bay	01/05/2004
<i>Athene noctua</i>	Little Owl	3	SH3691	Llanfechell	18/07/2005
<i>Athene noctua</i>	Little Owl	3	SH3793	Cemaes Bay	23/03/1999

Scientific Name	Common Name	Importance Category	Grid Reference	Location	Records Summary
<i>Buteo buteo</i>	Buzzard	3	SH330932	Cemlyn	6 records - 18/07/2002 - 2003
<i>Buteo buteo</i>	Buzzard	3	SH331932	Cemlyn NWWT Reserve	4 records - 26/01/2008 - 18/05/2013
<i>Buteo buteo</i>	Buzzard	3	SH335935	Cemlyn	09/04/2008
<i>Buteo buteo</i>	Buzzard	3	SH3393	Cemlyn	134 records - 12/05/1994 - 08/08/2013
<i>Buteo buteo</i>	Buzzard	3	SH3592	Tregale	3 records - 10/06/2008 - 20/06/2008
<i>Buteo buteo</i>	Buzzard	3	SH3594	Wylfa	17/02/2008
<i>Buteo buteo</i>	Buzzard	3	SH3793	Cemaes Bay	8 records - 03/03/1999 - 25/09/2008
<i>Calidris ferruginea</i>	Curlew Sandpiper	3	SH330932	Cemlyn	3 records - 20/05/2002 - 25/07/2002
<i>Calidris ferruginea</i>	Curlew Sandpiper	3	SH335935	Cemlyn	13/09/2007
<i>Calidris ferruginea</i>	Curlew Sandpiper	3	SH3393	Cemlyn	18 records - 31/05/1997 - 27/05/2012
<i>Calidris minuta</i>	Little Stint	3	SH330931	Cemlyn; Lagoon area	2 records - 26/05/2011 - 03/06/2011
<i>Calidris minuta</i>	Little Stint	3	SH3393	Cemlyn	11 records - 12/05/1994 - 02/08/2010
<i>Carduelis carduelis</i>	Goldfinch	3	SH3308892907	Cemlyn	02/06/2012
<i>Carduelis carduelis</i>	Goldfinch	3	SH330932	Cemlyn	3 records - 03/05/2002 - 20/07/2008
<i>Carduelis carduelis</i>	Goldfinch	3	SH331932	Cemlyn NWWT Reserve	4 records - 03/01/2008 - 18/05/2013
<i>Carduelis carduelis</i>	Goldfinch	3	SH3393	Cemlyn	36 records - 04/05/1994 - 31/07/2013
<i>Carduelis carduelis</i>	Goldfinch	3	SH3793	Cemaes Bay	25/04/2008
<i>Carduelis chloris</i>	Greenfinch	3	SH330932	Cemlyn	6 records - June 2002 - 20/07/2008
<i>Carduelis chloris</i>	Greenfinch	3	SH3393	Cemlyn	127 records - May 1994 - 08/08/2010
<i>Carduelis chloris</i>	Greenfinch	3	SH3593	Wylfa; Power Station Nature Trail	4 records - 16/02/1999 - 03/03/1999
<i>Carduelis flammea</i>	Mealy Redpoll	3	SH3393	Cemlyn	9 records - 03/05/1994 - 18/06/1999
<i>Carduelis spinus</i>	Siskin	3	SH3393	Cemlyn	20 records - 17/05/1994 - 16/05/2013
<i>Carduelis spinus</i>	Siskin	3	SH3693	Cemaes Bay	27/03/1999
<i>Carduelis spinus</i>	Siskin	3	SH3793	Cemaes Bay	9 records - 13/01/2000 - 28/04/2008
<i>Certhia familiaris</i>	Treecreeper	3	SH3793	Cemaes Bay	2 records - 12/01/2000 - 13/01/2000
<i>Columba oenas</i>	Stock Pigeon	3	SH331932	Cemlyn	2 records - all 26/01/2008
<i>Columba oenas</i>	Stock Pigeon	3	SH3393	Cemlyn	4 records - 30/05/1998 - 13/07/2011
<i>Corvus corax</i>	Common Raven	3	SH328927	Cemlyn; Bwthyn Penreos	2011
<i>Corvus corax</i>	Common Raven	3	SH330932	Cemlyn	5 records - 23/06/2002 - 2008
<i>Corvus corax</i>	Common Raven	3	SH331932	Cemlyn NWWT Reserve	3 records - 26/01/2008 - 18/05/2013
<i>Corvus corax</i>	Common Raven	3	SH333933	Cemlyn Bay	6 records - 27/04/2006 - 25/12/2006
<i>Corvus corax</i>	Common Raven	3	SH335935	Cemlyn	7 records - 30/01/2007 - 25/12/2007
<i>Corvus corax</i>	Common Raven	3	SH3393	Cemlyn	123 records - 23/06/1994 - 24/04/2012
<i>Corvus corax</i>	Common Raven	3	SH3593	Wylfa; Power Station Nature trail	3 records - 21/02/1999 - 03/03/1999
<i>Corvus corax</i>	Common Raven	3	SH3793	Cemaes Bay	20 records - 11/02/2002 - 09/09/2002
<i>Corvus corax</i>	Common Raven	3	SH3794	Llanbadrig	7 records - 15/02/1999 - 18/04/1999
<i>Cyanistes caeruleus</i>	Blue Tit	3	SH330932	Cemlyn	5 records - 2002 - 2008
<i>Cyanistes caeruleus</i>	Blue Tit	3	SH331932	Cemlyn NWWT Reserve	2 records - 26/01/2008 - 18/05/2013
<i>Cyanistes caeruleus</i>	Blue Tit	3	SH3393	Cemlyn	240 records - 20/06/1994 - 08/08/2013
<i>Cyanistes caeruleus</i>	Blue Tit	3	SH3593	Wylfa; Power station nature trail	6 records - 14/02/1999 - 03-03-1999
<i>Dendrocopos major</i>	Great Spotted Woodpecker	3	SH327928	Cemlyn; Bwthyn Penreos	4 records - 21/06/2011 - 07/07/2011
<i>Dendrocopos major</i>	Great Spotted Woodpecker	3	SH330932	Cemlyn	2 records - 12/07/2003 - 15/07/2008
<i>Dendrocopos major</i>	Great Spotted Woodpecker	3	SH335935	Cemlyn	01/10/2007
<i>Dendrocopos major</i>	Great Spotted Woodpecker	3	SH3393	Cemlyn	9 records - 06/06/1998 - 01/05/2012

Scientific Name	Common Name	Importance Category	Grid Reference	Location	Records Summary
<i>Dendrocopos major</i>	Great Spotted Woodpecker	3	SH3493	Cemlyn Bay; Cafnan	18/01/2000
<i>Dendrocopos major</i>	Great Spotted Woodpecker	3	SH3793	Cemaes Bay	2 records - 27/02/2002 - 27/09/2005
<i>Egretta garzetta</i>	Little Egret	3	SH3302093234	Cemlyn	4 records - 19/07/2013 - 02/08/2013
<i>Egretta garzetta</i>	Little Egret	3	SH3304493305	Cemlyn; In lagoon	23/04/2013 - 26/05/2013
<i>Egretta garzetta</i>	Little Egret	3	SH330932	Cemlyn	29/04/2008 - 10/05/2008
<i>Egretta garzetta</i>	Little Egret	3	SH330933	Cemlyn Bay	15/01/2007
<i>Egretta garzetta</i>	Little Egret	3	SH331932	Cemlyn NWWT Reserve	6 records - 26/01/2008 - 18/05/2013
<i>Egretta garzetta</i>	Little Egret	3	SH333933	Cemlyn Bay	17/07/2006
<i>Egretta garzetta</i>	Little Egret	3	SH335935	Cemlyn	4 records - 25/12/2006 - 25/12/2008
<i>Egretta garzetta</i>	Little Egret	3	SH3393	Cemlyn	72 records - 02/05/1994 - 17/05/2012
<i>Egretta garzetta</i>	Little Egret	3	SH3793	Cemaes Bay	17/12/2008
<i>Mergus merganser</i>	Goosander	3	SH3393	Cemlyn	3 records - 21/07/2005 - 09/06/2011
<i>Motacilla alba</i>	Pied Wagtail	3	SH3308792863	Cemlyn; Outside Warden's house	02/06/2012
<i>Motacilla alba</i>	Pied Wagtail	3	SH331932	Cemlyn NWWT Reserve	2 records - all 18/05/2013
<i>Motacilla alba</i>	Pied Wagtail	3	SH3393	Cemlyn	4 records - May 1998 - 03/06/2012
<i>Motacilla alba subsp. alba</i>	White Wagtail	3	SH3293	Cemlyn/Henborth	26/04/2008
<i>Motacilla alba subsp. alba</i>	White Wagtail	3	SH330932	Cemlyn	03/05/2008
<i>Motacilla alba subsp. alba</i>	White Wagtail	3	SH335935	Cemlyn	09/04/2008
<i>Motacilla alba subsp. alba</i>	White Wagtail	3	SH3393	Cemlyn	51 records - May 1994 - 03/06/2012
<i>Motacilla alba subsp. yarrellii</i>	Pied Wagtail	3	SH328934	Cemlyn; Bryn Aber	Spring 2011
<i>Motacilla alba subsp. yarrellii</i>	Pied Wagtail	3	SH3294393545	Cemlyn - Car Park (North)	02/06/2012
<i>Motacilla alba subsp. yarrellii</i>	Pied Wagtail	3	SH330932	Cemlyn	8 records - 2002 - July 2008
<i>Motacilla alba subsp. yarrellii</i>	Pied Wagtail	3	SH331928	Cemlyn; Plas Cemlyn	Spring 2011
<i>Motacilla alba subsp. yarrellii</i>	Pied Wagtail	3	SH331932	Cemlyn NWWT Reserve	3 records - 26/01/2008 - 18/05/2013
<i>Motacilla alba subsp. yarrellii</i>	Pied Wagtail	3	SH3393	Cemlyn	63 records - May 1994 - 03/06/2012
<i>Motacilla cinerea</i>	Grey Wagtail	3	SH330932	Cemlyn	20/07/2008
<i>Motacilla cinerea</i>	Grey Wagtail	3	SH3393	Cemlyn	43 records - 26/06/1995 - 28/06/2013
<i>Motacilla cinerea</i>	Grey Wagtail	3	SH3793	Cemaes Bay	48 records - 10/04/1999 - 27/12/2008
<i>Motacilla flava</i>	Yellow Wagtail	3	SH3393	Cemlyn	26 records - 30/04/1998 - 15/05/2013
<i>Motacilla flava subsp. flava</i>	Blue–Headed Wagtail	3	SH3393	Cemlyn	11 records - 14/05/1994 - 06/05/2011
<i>Parus major</i>	Great Tit	3	SH328934	Cemlyn; Bryn Aber	Jun-11
<i>Parus major</i>	Great Tit	3	SH330932	Cemlyn	5 records - 2002 - 2008
<i>Parus major</i>	Great Tit	3	SH331932	Cemlyn NWWT Reserve	2 records - 26/01/2008 - 18/05/2013
<i>Parus major</i>	Great Tit	3	SH335929	Cemlyn; Tyddyn Sidney	Jun-11
<i>Parus major</i>	Great Tit	3	SH3393	Cemlyn	136 records - May 1994 - 08/08/2013
<i>Parus major</i>	Great Tit	3	SH3593	Wylfa; Power station nature trail	6 records - 14/02/1999 - 03-03-1999
<i>Phalacrocorax aristotelis</i>	Shag	3	SH3293	Cemlyn	2 records - 06/05/1996 - 27/06/1996
<i>Phalacrocorax aristotelis</i>	Shag	3	SH330932	Cemlyn	4 records - 05/08/2002 - 20/06/2008
<i>Phalacrocorax aristotelis</i>	Shag	3	SH331932	Cemlyn NWWT Reserve	5 records - 03/01/2008 - 18/05/2013
<i>Phalacrocorax aristotelis</i>	Shag	3	SH3393	Cemlyn	29 records - 30/06/1994 - 03/06/2012
<i>Phylloscopus collybita</i>	Common Chiffchaff	3	SH330932	Cemlyn	21/05/2002
<i>Phylloscopus collybita</i>	Common Chiffchaff	3	SH331932	Cemlyn NWWT Reserve	18/05/2013
<i>Phylloscopus collybita</i>	Common Chiffchaff	3	SH335935	Cemlyn	2 records - 14/05/2007 - 09/04/2008
<i>Phylloscopus collybita</i>	Common Chiffchaff	3	SH3393	Cemlyn	43 records - 02/05/1994 - 01/06/2013

Scientific Name	Common Name	Importance Category	Grid Reference	Location	Records Summary
<i>Phylloscopus collybita</i>	Common Chiffchaff	3	SH3594	Wylfa	2 records - 30/03/2002 - 14/05/2002
<i>Phylloscopus collybita</i>	Common Chiffchaff	3	SH3793	Cemaes Bay	3 records - 31/03/2002 - 26/03/2005
<i>Podiceps cristatus</i>	Great Crested Grebe	3	SH330932	Cemlyn	17/05/2008
<i>Podiceps cristatus</i>	Great Crested Grebe	3	SH3349293702	Cemlyn	3 records - 24/04/2013 - 21/05/2013
<i>Podiceps cristatus</i>	Great Crested Grebe	3	SH3393	Cemlyn	24 records - 26/08/1994 - 07/05/2013
<i>Prunella modularis</i>	Dunnock	3	SH330932	Cemlyn	5 records - 2002 - 2008
<i>Prunella modularis</i>	Dunnock	3	SH331932	Cemlyn NWWT Reserve	4 records - 26/01/2008 - 18/05/2013
<i>Prunella modularis</i>	Dunnock	3	SH3393	Cemlyn	205 records - 1994 - 03/06/2012
<i>Prunella modularis</i>	Dunnock	3	SH3594	Wylfa; Power Station nature Trail	5 records - 14/02/1999 - 03/03/1999
<i>Rallus aquaticus</i>	Water Rail	3	SH335935	Cemlyn	4 records - 25/12/2006 - 23/11/2007
<i>Rallus aquaticus</i>	Water Rail	3	SH3393	Cemlyn Bay	12 records - 18/09/1995 - 22/12/2000
<i>Rallus aquaticus</i>	Water Rail	3	SH3493	Cafnan, Cemlyn	10 records - 06/01/2000 - 17/12/2000
<i>Rissa tridactyla</i>	Kittiwake	3	SH3304493305	Cemlyn	3 records - 29/04/2013 - 10/05/2013
<i>Rissa tridactyla</i>	Kittiwake	3	SH330931	Cemlyn; Lagoon	2011
<i>Rissa tridactyla</i>	Kittiwake	3	SH330932	Cemlyn	5 records - 26/05/2002 - 29/06/2008
<i>Rissa tridactyla</i>	Kittiwake	3	SH331932	Cemlyn NWWT Reserve	4 records - 03/01/2008 - 18/05/2013
<i>Rissa tridactyla</i>	Kittiwake	3	SH3393	Cemlyn	48 records - May 1994 - 03/06/2012
<i>Rissa tridactyla</i>	Kittiwake	3	SH3594	Wylfa; Wylfa Head seawatches	4 records - 12/08/2006 - 02/09/2006
<i>Saxicola rubetra</i>	Whinchat	3	SH330932	Cemlyn	02/05/2002
<i>Saxicola rubetra</i>	Whinchat	3	SH333933	Cemlyn Bay	27/07/2006
<i>Saxicola rubetra</i>	Whinchat	3	SH335935	Cemlyn	30/07/2007
<i>Saxicola rubetra</i>	Whinchat	3	SH3393	Cemlyn	51 records - 02/05/1994 - 17/05/2013
<i>Saxicola torquata</i>	Stonechat	3	SH330932	Cemlyn	8 records - 2002 - June 2008
<i>Saxicola torquata</i>	Stonechat	3	SH331932	Cemlyn NWWT Reserve	6 records - 03/01/2008 - 18/05/2013
<i>Saxicola torquata</i>	Stonechat	3	SH3393	Cemlyn	138 records - 1994 - 2011
<i>Stercorarius skua</i>	Great Skua	3	SH330932	Cemlyn	29/05/2002
<i>Stercorarius skua</i>	Great Skua	3	SH3393	Cemlyn	15 records - 08/07/1994 - 18/07/2011
<i>Stercorarius skua</i>	Great Skua	3	SH3594	Wylfa; Wylfa Head seawatches	3 records - 28/08/2006 - 02/09/2006
<i>Strix aluco</i>	Tawny Owl	3	SH330932	Cemlyn	May-08
<i>Strix aluco</i>	Tawny Owl	3	SH3393	Cemlyn	4 records - 01/06/1996 - 31/07/2007
<i>Sylvia atricapilla</i>	Blackcap	3	SH330932	Cemlyn	2 records - 28/04/2008 - 03/05/2008
<i>Sylvia atricapilla</i>	Blackcap	3	SH3393	Cemlyn	14 records - 18/05/1998 - 08/07/2013
<i>Sylvia atricapilla</i>	Blackcap	3	SH3592	Tregele; The Firs	02/05/1999
<i>Sylvia atricapilla</i>	Blackcap	3	SH3793	Cemaes Bay	19 records - 19/01/2000 - 31/03/2008
<i>Sylvia curruca</i>	Lesser Whitethroat	3	SH330932	Cemlyn	3 records - 09/05/2002 - 04/05/2008
<i>Sylvia curruca</i>	Lesser Whitethroat	3	SH333933	Cemlyn Bay	17/07/2006
<i>Sylvia curruca</i>	Lesser Whitethroat	3	SH335929	Cemlyn; Tyddyn Sidney	11/07/2011
<i>Sylvia curruca</i>	Lesser Whitethroat	3	SH335935	Cemlyn	14/05/2007
<i>Sylvia curruca</i>	Lesser Whitethroat	3	SH3393	Cemlyn	15 records - 20/05/1996 - 03/08/2013
<i>Sylvia curruca</i>	Lesser Whitethroat	3	SH344931	Cemlyn Bay	07/05/2004
<i>Sylvia curruca</i>	Lesser Whitethroat	3	SH3594	Wylfa	14/05/2002

## Appendix B. Target Species Surveys – Additional Results

Species	2012	2013	2014
<b>(CB = Confirmed Breeding; PB = Probable Breeding; PsB = Possible Breeding; - = not seen)</b>			
Blackcap ( <i>Sylvia atricapilla</i> )	-	PsB	-
Blackbird ( <i>Turdus merula</i> )	-	PB	-
Blue tit ( <i>Cyanistes caeruleus</i> )	-	PsB	-
Bullfinch ( <i>Pyrrhula pyrrhula</i> )	-	PB	-
<b>Carrion crow (<i>Corvus corone</i>)</b>	-	<b>CB</b>	-
Chaffinch ( <i>Fringilla coelebs</i> )	-	PsB	-
<b>Chiffchaff (<i>Phylloscopus collybita</i>)</b>	-	<b>CB</b>	-
Coal tit ( <i>Periparus ater</i> )	-	PsB	-
Collared dove ( <i>Streptopelia decaocto</i> )	-	PsB	-
Cuckoo ( <i>Cuculus canorus</i> )	PB	-	-
Dunnock ( <i>Prunella modularis</i> )	-	PB	-
Goldfinch ( <i>Carduelis carduelis</i> )	-	PsB	-
Gold crest ( <i>Regulus regulus</i> )	-	PB	-
Grasshopper warbler ( <i>Locustella naevia</i> )	PB	PB	-
Great tit ( <i>Parus major</i> )	-	PsB	-
Greater spotted woodpecker ( <i>Dendrocopos major</i> )	-	PsB	-
Greenfinch ( <i>Chloris chloris</i> )	-	PsB	-
<b>Herring gull (<i>Larus argentatus</i>)</b>	<b>CB</b>	-	-
<b>House sparrow (<i>Passer domesticus</i>)</b>	<b>CB</b>	<b>PsB</b>	-
Jackdaw ( <i>Coloeus monedula</i> )	-	PsB	-
<b>Lesser redpoll (<i>Carduelis cabaret</i>)</b>	<b>CB</b>	-	-
Lesser whitethroat ( <i>Sylvia curruca</i> )	-	PsB	-
<b>Linnet (<i>Carduelis cannabina</i>)</b>	<b>CB</b>	<b>CB</b>	-
Long tailed tit ( <i>Aegithalos caudatus</i> )	-	PsB	-
Magpie ( <i>Pica pica</i> )	-	PB	-
<b>Meadow pipit (<i>Anthus pratensis</i>)</b>	-	<b>CB</b>	-
Moorhen ( <i>Gallinula chloropus</i> )	-	PsB	-
Pied wagtail ( <i>Motacilla alba</i> )	-	PsB	-
Raven ( <i>Corvus corax</i> )	-	PsB	-
Reed bunting ( <i>Emberiza schoeniclus</i> )	-	PB	-
Robin ( <i>Erithacus rubecula</i> )	-	PsB	-
Rock pipit ( <i>Anthus petrosus</i> )	-	PB	-
Sedge warbler ( <i>Acrocephalus schoenobaenus</i> )	-	PsB	-

<b>Species</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
<b>(CB = Confirmed Breeding; PB = Probable Breeding; PsB = Possible Breeding; - = not seen)</b>			
Skylark ( <i>Alauda arvensis</i> )	CB	-	-
Song thrush ( <i>Turdus philomelos</i> )	CB	PB	-
Spotted flycatcher ( <i>Muscicapa striata</i> )	PB	-	-
Starling ( <i>Sturnus vulgaris</i> )	CB	-	-
Stonechat ( <i>Saxicola torquata</i> )	-	PsB	-
Tawny owl ( <i>Strix aluco</i> )	-	CB	CB
White throat ( <i>Sylvia communis</i> )	-	PB	-
Willow warbler ( <i>Phylloscopus trochilus</i> )	-	PB	-
Wood pigeon ( <i>Columba palumbus</i> )	-	PsB	-
Wren ( <i>Troglodytes troglodytes</i> )	-	PB	-

## Appendix C. Combined Results – Summary

Table C.1 : Breeding Birds - Results Summary (X = Relevant legal protection or policy; CB = Confirmed Breeding; PB = Probable Breeding; PsB = Possible Breeding; NB = Not Breeding; and - = Not observed).

Species	Protection/Conservation Status						Breeding Status				
	Annex I	Schedule 1 (WCA, 1998)	Section 42 (NERC Act, 2006)	LBAP	Red List	Amber List	2010	2011	2012	2013	2014
Barn owl	-	X	-	X	-	X	PB	-	CB	CB	CB
Blackbird	-	-	-	-	-	-	CB	CB	CB	CB	CB
Blackcap	-	-	-	-	-	-	PsB	PsB	CB	PB	CB
Black-headed gull	-	-	-	-	-	-	-	-	-	NB	NB
Black-tailed godwit	-	-	-	-	-	-	-	-	-	-	NB
Blue tit	-	-	-	-	-	-	CB	CB	CB	CB	CB
Bullfinch	-	-	-	-	X	-	CB	CB	CB	PB	CB
Buzzard	-	-	-	-	-	-	PsB	PsB	CB	CB	CB
Canada goose	-	-	-	-	-	-	-	-	CB	CB	CB
Carrion crow	-	-	-	-	-	-	-	-	CB	CB	CB
Chaffinch	-	-	-	-	-	-	CB	CB	CB	CB	CB
Chiffchaff	-	-	-	-	-	-	CB	CB	CB	CB	CB
Chough	X	X	-	X	X	X	CB	CB	CB	CB	CB
Coal tit	-	-	-	-	-	-	PsB	PsB	CB	CB	PB
Collared dove	-	-	-	-	-	-	CB	CB	CB	PB	PB
Common crossbill	-	X	-	-	-	-	-	-	NB	-	-
Common sandpiper	-	-	-	-	-	-	-	-	-	-	PsB
Cormorant	-	-	-	-	-	-	-	-	-	NB	NO
Corncrake	X	X	X	X	X	X	-	-	-	-	NB
Cuckoo	-	-	X	-	X	-	-	-	-	PsB	PsB
Curlew	-	-	-	-	X	-	NB	-	-	NB	NB

<b>Species</b>	<b>Protection/Conservation Status</b>					<b>Breeding Status</b>					
	<b>Annex I</b>	<b>Section 42 (NERC Act, 2006)</b>	<b>Schedule 1 (WCA, 1998)</b>	<b>LBAP</b>	<b>Red List</b>	<b>Amber List</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Dunnock	-	-	-	-	X	-	PsB	PsB	CB	CB	CB
Feral pigeon	-	-	-	-	-	-	-	-	CB	PB	PB
Fieldfare	-	X	X	-	-	-	NB	NB	-	-	-
Garden warbler	-	-	-	-	-	-	PsB	PsB	CB	-	-
Goldcrest	-	-	-	-	-	-	PsB	PsB	CB	CB	CB
Goldfinch	-	-	-	-	-	-	CB	CB	CB	CB	CB
Goshawk	X	X	-	-	-	-	NB	-	PsB	NB	-
Grasshopper warbler	-	-	X	-	X	-	CB	PB	PB	PB	PB
Great black-backed gull	-	-	-	-	-	-	-	-	CB	NB	NB
Great spotted woodpecker	X	-	-	-	-	-	PB	PB	CB	CB	PB
Great tit	-	-	-	-	-	-	CB	CB	CB	CB	CB
Green woodpecker	-	-	-	-	-	-	-	-	CB	-	-
Greenfinch	-	-	-	-	-	-	CB	CB	-	CB	CB
Grey heron	-	-	-	-	-	-	CB	CB	CB	CB	CB
Grey wagtail	-	-	-	-	-	-	-	-	-	NB	PsB
Greylag goose	-	-	-	-	-	-	NB	-	CB	PsB	NB
Herring gull	-	-	X	-	X	-	-	-	CB	CB	CB
Hen harrier	X	X	X	-	X	-	-	-	-	-	NB
House martin	-	-	-	-	-	-	CB	CB	-	CB	CB
House sparrow	-	-	X	-	X	-	CB	CB	CB	CB	CB
Jackdaw	-	-	-	-	-	-	NB	NB	CB	CB	CB
Jay	-	-	-	-	-	-	-	-	CB	-	-
Kestrel	-	-	-	-	X	-	PsB	PsB	CB	PsB	CB
Lesser black-backed gull	-	-	-	-	-	-	-	-	CB	CB	CB

<b>Species</b>	<b>Protection/Conservation Status</b>					<b>Breeding Status</b>					
	<b>Annex I</b>	<b>Section 42 (NERC Act, 2006)</b>	<b>Schedule 1 (WCA, 1998)</b>	<b>LBAP</b>	<b>Red List</b>	<b>Amber List</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Lesser redpoll	-	-	X	-	X	-	-	-	CB	CB	NB
Lesser whitethroat	-	-	-	-	-	-	PsB	PsB	-	PB	PB
Linnet	-	-	X	-	X	-	PB	-	CB	CB	CB
Little egret	X	-	-	-	-	-	-	-	-	-	NB
Long-tailed tit	-	-	-	-	-	-	PsB	PsB	CB	PsB	PB
Magpie	-	-	-	-	-	-	-	CB	CB	CB	CB
Mallard	-	-	-	-	-	-	CB	CB	CB	CB	PB
Manx shearwater	X	-	-	-	-	-	-	-	-	-	PsB
Meadow pipit	-	-	-	-	-	-	CB	CB	CB	-	CB
Merlin	-	X	-	-	-	-	-	-	NB	NB	-
Mistle thrush	-	-	-	-	-	-	CB	CB	CB	CB	PsB
Moorhen	-	-	-	-	-	-	-	-	-	CB	-
Mute swan	-	-	-	-	-	-	-	-	CB	-	-
Nuthatch	-	-	-	-	-	-	-	-	CB	-	PsB
Osprey	X	X	-	-	-	-	-	-	-	-	NB
Oystercatcher	-	-	-	-	-	-	NB	NB	CB	CB	PB
Peregrine	X	X	-	-	-	-	NB	NB	NB	PsB	PsB
Pheasant	-	-	-	-	-	-	PsB	PsB	CB	CB	PB
Pied wagtail	-	-	-	-	-	-	CB	CB	CB	PB	CB
Raven	-	-	-	-	-	-	NB	CB	CB	CB	CB
Red-breasted merganser	-	-	-	-	-	-	NB	NB	-	-	-
Red-legged partridge	-	-	-	-	-	-	-	-	-	-	PsB
Redshank	-	-	-	-	-	-	NB	-	PB	PsB	NB
Redstart	-	-	-	-	-	-	-	-	-	-	PsB

<b>Species</b>	<b>Protection/Conservation Status</b>					<b>Breeding Status</b>					
	<b>Annex I</b>	<b>Section 42 (NERC Act, 2006)</b>	<b>Schedule 1 (WCA, 1998)</b>	<b>LBAP</b>	<b>Red List</b>	<b>Amber List</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Redwing	-	X	X	-	-	-	NB	-	-	-	-
<b>Reed bunting</b>	-	-	-	-	X	-	PB	-	CB	CB	CB
Ring ouzel	-	-	X	-	X	-	-	-	-	-	NB
<b>Robin</b>	-	-	-	-	-	-	CB	CB	CB	CB	CB
<b>Rock pipit</b>	-	-	-	-	-	-	-	-	CB	CB	PB
<b>Rook</b>	-	-	-	-	-	-	CB	CB	CB	CB	CB
Sand martin	-	-	-	-	-	-	-	-	-	-	PsB
<b>Sedge warbler</b>	-	-	-	-	-	-	CB	CB	CB	CB	CB
Shag	-	-	-	-	-	-	-	-	-	-	NB
Shelduck	-	-	-	-	-	-	-	-	-	-	NB
Short-eared owl	X	-	-	-	-	-	-	-	-	-	NB
<b>Siskin</b>	-	-	-	-	-	-	PsB	PsB	CB	PsB	PsB
<b>Skylark</b>	-	-	X	X	X	X	PsB	-	CB	PsB	NB
<b>Snipe</b>	-	-	-	-	-	-	PB	-	CB	PsB	PsB
<b>Song thrush</b>	-	-	X	X	X	X	CB	CB	CB	CB	CB
Sparrowhawk	-	-	-	-	-	-	PsB	PsB	PsB	PsB	PB
Spotted flycatcher	-	-	X	-	X	-	-	-	PB	-	PsB
<b>Starling</b>	-	-	X	-	X	-	CB	CB	CB	CB	CB
<b>Stock dove</b>	-	-	-	-	-	-	-	-	-	NB	CB
<b>Stonechat</b>	-	-	-	-	-	-	CB	CB	CB	CB	CB
<b>Swallow</b>	-	-	-	-	-	-	CB	CB	CB	CB	CB
<b>Swift</b>	-	-	-	-	-	-	-	-	-	NB	CB
<b>Tawny owl</b>	-	-	-	-	-	-	-	-	-	CB	-
<b>Treecreeper</b>	-	-	-	-	-	-	-	-	CB	-	PsB

<b>Species</b>	<b>Protection/Conservation Status</b>				<b>Breeding Status</b>							
	<b>Annex I</b>	<b>Section 42 (NERC Act, 2006)</b>	<b>Schedule 1 (WCA, 1998)</b>	<b>LBAP</b>	<b>Red List</b>	<b>Amber List</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	
Turnstone	-	-	-	-	-	-	-	-	-	NB	-	
Twite	-	-	X	-	X	-	-	-	-	NB	-	
<b>Wheatear</b>	-	-	-	-	-	-	CB	CB	CB	NB	PB	
Whimbrel	-	X	X	-	-	-	NB	-	NB	-	NB	
Whinchat	-	-	-	-	-	-	-	-	-	CB	-	-
Whitethroat	-	-	-	-	-	-	-	CB	CB	CB	CB	
Willow warbler	-	-	-	-	-	-	CB	CB	CB	CB	CB	
Wood pigeon	-	-	-	-	-	-	PB	PB	CB	PB	PB	
Woodcock	-	-	-	-	-	-	-	-	CB	NB	-	
Wren	-	-	-	-	-	-	PB	PB	CB	CB	CB	
Yellowhammer	-	-	X	-	X	-	PsB	-	-	-	-	



---

# **Site Preparation and Clearance**

## **Environmental Statement**

### **Volume 3 – Appendix 14-11**

### **Consultancy Report: Barn Owl Technical**

### **Summary Report**

---

[This page is intentionally blank]



## Wylfa Newydd

Horizon Nuclear Power (Wylfa) Ltd

### Technical Summary Report - Barn Owl

60PO8032/TER/REP/002 | 2

WN034-JAC-PAC-REP-00004

#### Document history and status

Revision	Date	Description	By	Review	Approved
		Wylfa Barn Owl Technical Summary Report	Laura Gore	Dave Jones	
1	16/12/15	Minor edits following proof read	Suzanne Jenkins	Jonathan Jackson	Rob Bromley
2	17/03/16	Minor edits following HNP IC comments	Jonathan Jackson	Nick Clark	

#### Distribution of copies

Revision	Issue approved	Date issued	Issued to	Comments

## **Wylfa Newydd**

Project no: 60PO8032  
Document title: Technical Summary Report - Barn Owl  
Document No.: 60PO8032/TER/REP/002  
Revision: 2  
Date: 17 March 2016  
Client name: Horizon Nuclear Power (Wylfa) Ltd  
Client no: WN034-JAC-PAC-REP-00004  
Project manager: Robert Bromley  
Author: Laura Gore  
File name: \\SOUFIL01\Projects\\$PROJECTS\\$B1496000 Wylfa Marine Services\6. Reports\Jacobs 2015 Technical Summary Reports\60PO8032 Barn Owl Technical Summary Report 2015 Issued to RB 27 07 15.docx

Jacobs U.K. Limited

Churchill House  
Churchill Way  
Cardiff, CF10 2HH  
United Kingdom  
T +44 (0)29 2035 4200  
F +44 (0)29 2035 3222  
[www.jacobs.com](http://www.jacobs.com)

© Copyright 2015 Jacobs U.K. Limited. The concepts and information contained in this document are the property of Jacobs. Use or copying of this document in whole or in part without the written permission of Jacobs constitutes an infringement of copyright.

Limitation: This report has been prepared on behalf of, and for the exclusive use of Jacobs' Client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

## Contents

<b>Executive Summary.....</b>	<b>1</b>
<b>1. Introduction.....</b>	<b>2</b>
1.1 Overview.....	2
1.2 Wylfa Newydd Project .....	2
1.3 Site Description .....	2
1.4 Aims and Objectives.....	3
1.5 Summary of Work.....	3
1.6 Legal Status.....	3
<b>2. Methodology .....</b>	<b>5</b>
2.1 Desk Survey .....	5
2.2 Field Survey.....	5
2.2.1 Habitat Assessment.....	5
2.2.2 Building Inspection .....	6
2.2.3 Vantage Point Survey.....	6
2.3 Limitations .....	6
<b>3. Results.....</b>	<b>7</b>
3.1 Desk Survey .....	7
3.2 Field Survey.....	7
3.2.1 Habitat Assessment.....	7
3.2.2 Building Inspection .....	7
3.2.3 Vantage Point Surveys .....	17
<b>4. Discussion .....</b>	<b>18</b>
<b>5. Conclusions and Recommendations .....</b>	<b>19</b>
<b>6. References .....</b>	<b>20</b>
<b>7. Figures.....</b>	<b>21</b>

### Appendix A. Cofnod Data

### Appendix B. Incidental Records

## Executive Summary

Horizon Nuclear Power Wylfa Ltd. (Horizon) is currently planning to develop a new nuclear power station on Anglesey (the Wylfa Newydd Generating Station) as identified in the National Policy Statement for Nuclear Power Generation (EN-6). The Wylfa Newydd Project (the Project) will require a number of applications to be made under different legislation to different regulators. Jacobs UK Ltd (Jacobs) was commissioned to collect baseline data to inform the various applications, assessments and permits that will be submitted for approval to construct and operate the Wylfa Newydd Generating Station.

This technical summary report provides a single resource regarding all survey and background data available for barn owl *Tyto alba* in the study area that comprises the Wylfa Newydd Development Area and the surrounding 500m. General bird surveys of the study area have taken place in consecutive years between 2010 and 2014, and specific barn owl surveys have been undertaken between winter 2011 and summer 2015.

Data gathering has included a review of:

- online resources and local records centre search;
- incidental records;
- habitat assessment survey results;
- building and nest box inspection survey results; and
- vantage point survey results.

The results show that there is suitable habitat for barn owl within the study area comprising rank grassland, scrub and woodland margins, but it is limited in abundance. The results also show that the following nesting and roosting sites have been identified:

- three confirmed breeding sites;
- five regular roosts;
- seven occasional roosts; and
- one historical regular roost.

The results from the report also show that mitigation for barn owl implemented to date has been successful within the study area. This comprises confirmed breeding at the Cafnan Farm Wildlife Tower in 2014 and 2015 (the tower was constructed in 2013) producing five and three fledglings respectively. Additionally, potential breeding was recorded in Caerdegog Isaf Wildlife Barn in 2014. In 2015 nesting jackdaw *Corvus monedula* were recorded here making it unlikely that barn owl used it in the most recent breeding season, but barn owl may return to use it in future years as they have been frequently recorded in this area.

Analysis of the compiled results to date indicates that the study area is likely to support two breeding pairs of barn owl, and that these birds contribute significantly to the wider meta-population present on Anglesey.

## 1. Introduction

This report provides a technical summary of the data collected on barn owl within the Wylfa Newydd Development Area and from sites within a 500m buffer zone around the boundary of the Wylfa Newydd Development Area.

### 1.1 Overview

Horizon Nuclear Power Wylfa Ltd. (Horizon) is currently planning to develop a new nuclear power station on Anglesey as identified in the National Policy Statement for Nuclear Power Generation (EN-6). The Wylfa Newydd Project (the Project) comprises the proposed new nuclear power station (the Wylfa Newydd Generating Station), including the reactors, associated plant and ancillary structures and features, together with all of the development needed to support its delivery, such as highway improvements, worker accommodation and specialist training facilities. The Project will require a number of applications to be made under different legislation to different regulators. As a nationally significant infrastructure project under the Planning Act 2008, the construction and operation must be authorised by a development consent order.

Jacobs UK Ltd (Jacobs) was commissioned by Horizon to undertake a full ecological survey programme within the vicinity of the Power Station Site. This work has included the gathering of baseline data to inform the various applications, assessments and permits that will be submitted for approval to construct and operate the Power Station and Associated Development.

### 1.2 Wylfa Newydd Project

The Project includes the Wylfa Newydd Generating Station and Associated Development<sup>1</sup>. The Wylfa Newydd Generating Station includes two UK Advanced Boiling Water Reactors to be supplied by Hitachi-GE Nuclear Energy Ltd, associated plant and ancillary structures and features. In addition to the reactors, development on the Power Station Site (the indicative area of land and sea within which the majority of the permanent Wylfa Newydd Generating Station buildings, plant and structures would be situated) will include steam turbines, control and service buildings, operational plant, radioactive waste storage buildings, ancillary structures, offices and coastal developments. The coastal developments will include a Cooling Water System (CWS) and breakwater, and a Marine Off-Loading Facility (MOLF).

### 1.3 Site Description

The Wylfa Newydd Development Area (the indicative areas of land and sea, including the Power Station Site, the Wylfa NPS<sup>2</sup> Site and the surrounding areas that would be used for the construction and operation of the Wylfa Newydd Generating Station) covers an area of approximately 380ha. It is bounded to the north by the coast and the existing Magnox power station (the Existing Power Station). To the east, it is separated from Cemaes by a narrow corridor of agricultural land. The A5025 and residential properties define part of the south-east boundary, with a small parcel of land spanning the road to the north-east of Tregele. To the south and west, the Wylfa Newydd Development Area abuts agricultural land, and to the west it adjoins the coastal hinterland.

The Wylfa Newydd Development Area includes the headland south of Wylfa Head candidate Wildlife Site. There is one designated site for nature conservation within the Wylfa Newydd Development Area; Tre'r Gof Site of Special Scientific Interest (SSSI). It is also within 1km of the Cae Gwyn SSSI, Cemlyn Bay Special Area of Conservation (SAC) and SSSI, and the Ynys Feurig, the Skerries and Cemlyn Bay Special Protection Area (SPA).

<sup>1</sup> Development needed to support delivery of the Wylfa Newydd Generating Station is referred to as Associated Development. This includes highway improvements along the A5025, park and ride facilities for construction workers, Logistics Centre, Temporary Workers' Accommodation, specialist training facilities, Horizon's Visitor Centre and media briefing facilities.

<sup>2</sup> The site identified on Anglesey by the National Policy Statement for Energy EN-6/NPS EN-6 as potentially suitable for the deployment of a new nuclear power station.

Tre'r Gof is a small basin mire adjacent to the Existing Power Station, west of Cemaes. The area receives mineral-enriched waters from the surrounding boulder clay leading to the development of notable flora. It is the botanical interest that provides the reason for the designation of the site as a SSSI.

Cae Gwyn SSSI is located immediately to the south of the site to the west of Llanfachell. The site comprises two wetland areas separated by an outcrop of rock with heathland vegetation. The southern wetland is confined by a rock basin and is dominated by bogmoss (*Sphagnum* spp.) and a wide variety of common wetland herbs. The northern wetland has a different flora containing denser areas of willow (*Salix* spp.) and common reed (*Phragmites communis*).

## 1.4 Aims and Objectives

The purpose of this technical summary is to provide a single resource regarding all survey and background data available for barn owl to inform and support the Ecological Chapter of the Environmental Impact Assessment (EIA) for development of the Wylfa Newydd Generating Station.

The specific aims of the surveys completed to date were:

- identify foraging habitats suitable for barn owl within the study area;
- determine the presence of roosts and availability of potential roosts within the study area;
- identify presence, distribution, and abundance of barn owl in the study area; and
- identify the breeding status of barn owl in the study area.

## 1.5 Summary of Work

A variety of bird surveys in the study area have taken place in consecutive years between 2010 and 2015. Specific barn owl surveys have been undertaken in:

- winter 2011/12 (Arup, 2012);
- summer 2012 (Arup, 2012);
- summer 2013 (Jacobs, 2013);
- summer 2014 (Jacobs, 2014a); and
- summer 2015 (unpublished monitoring of existing mitigation buildings (see section 2.2.2)).

During these surveys a significant amount of data was collected and it is the intention of this report to collate and interpret these data. Collation will also include a review of biological records for the study area and a 2km search radius as provided by Cofnod (The North Wales Environmental Information Service). Data will also be summarised from information contained within incidental records collected by ecologists during surveys for other habitats and species.

## 1.6 Legal Status

Barn owl is listed in the Bern Convention 1979 that places a legal obligation to protect this bird species. This convention has been implemented in UK law through the Wildlife and Countryside Act 1981 (as amended) (WCA, 1981).

As well as being listed among all wild birds protected by the WCA, barn owl is also given the highest level of protection as it is listed on Schedule 1 of the WCA. Taken together the legislation makes it an offence to:

- intentionally injure, kill or take a wild bird;
- intentionally take, damage or destroy the eggs or nest of a bird, while that nest is in use or being built;
- intentionally or recklessly disturb a barn owl while it is building a nest or is at, on or near a nest containing eggs or young; or

- intentionally or recklessly disturb the dependent young of a barn owl.

Since barn owls do not build a nest but instead lay their eggs on a flat surface known as a scrape, the disturbance is considered liable to prosecution once the first egg is laid (Barn Owl Trust, 2012).

## 2. Methodology

A variety of data sources have been used to establish the status of barn owl populations within the study area with reference to methodology described in Shawyer (2011) and the Barn Owl Trust (2010a). The data sources are summarised in table 1.

**Table 1 : Sources of Data**

Data Gathering	2010	2011	2012	2013	2014	2015
Desk/Background Information	Y	-	-	Y	-	-
Incidental Sightings (Breeding Bird and Wintering Bird Surveys)	Y	Y	Y	Y	Y	-
Habitat Assessment for Barn Owl	-	-	-	Y	-	-
Building Inspections for Barn Owl	-	-	-	Y	Y	Y
Vantage Point Survey for Barn Owl	-	-	-	-	Y	-

### 2.1 Desk Survey

A background data search was requested in order to inform the scope of surveys required to inform future EIA and Habitats Regulations Assessments (HRA). This was requested from Cofnod and included all legally protected and notable species records, including barn owl, within 2.5km of the study area. These data were then analysed and mapped.

Breeding bird surveys were undertaken by Arup in 2010 and 2011. No species-specific barn owl survey was undertaken in these years but incidental sightings of barn owls during the breeding bird surveys were recorded. Subsequent breeding and wintering bird surveys undertaken by Jacobs in 2013 and 2014 also recorded incidental sightings of the species. These data have been mapped to provide an indication of barn owl presence in the study area.

### 2.2 Field Survey

#### 2.2.1 Habitat Assessment

A habitat suitability survey was undertaken in 2013 to identify the distribution of all areas that had the potential to provide foraging habitat for barn owls within the study area. Areas were categorised dependent on certain habitat characteristics that would influence suitability for an abundant small mammal population; small mammals are the preferred prey of barn owls and so habitats suitable for supporting large numbers of these animals is an indicator of likely suitability for barn owls (Barn Owl Trust, 2012). The areas were categorised as follows:

- suitable – fields of rough grassland, notably those with a thatch layer present and tussocks throughout the field, showing no signs of recent management for a number of years or excessive human disturbance;
- less suitable – a field that exhibited features suitable for field voles *Microtus agrestis* and other small mammals but not widespread throughout the field; or
- not suitable – fields which do not exhibit any of the features or characteristics listed above.

During the habitat suitability survey potential roosting/breeding sites were also identified and subjected to a detailed inspection during a second survey by a licensed surveyor (see section 2.2.2 below).

All trees within the study area were also assessed for the potential to support roosting or nesting barn owls in accordance with methodology described by Shawyer (2011).

## 2.2.2 Building Inspection

During the initial breeding bird and winter bird surveys, and later during the habitat assessment, buildings that had the potential to support roosting and/or breeding barn owls were noted for further investigation.

A total of 40 locations have been inspected for barn owls within the study area between 2011 and 2015. These inspections were undertaken in:

- winter 2011/12 (Arup, 2012);
- summer 2012 (Arup, 2012);
- summer 2013 (Jacobs, 2013);
- summer 2014 (Jacobs, 2014a); and
- summer 2015 (British Trust for Ornithology volunteers arranged by Jacobs).

Inspection surveys of all buildings and nest boxes were conducted in the presence of a barn owl licenced ecologist.

All identified properties with agreed landowner access were inspected externally and internally for suitable potential barn owl access points, with evidence of breeding or roosting barn owl (such as droppings, pellets, feathers, chicks, eggs, and adults carrying food items) being recorded (Barn Owl Trust, 2012). All features inside a property were surveyed for barn owl field signs, including the walls, ledges, floors, hay/straw bales, flat surfaces on top of old machinery etc. The outside of buildings were also examined for signs of barn owl.

A roosting site was categorised as either a regular roost having greater than 10 pellets or an occasional roost with less than 10 pellets (Barn Owl Trust, 2010a).

Three barn owl nest boxes were also inspected, located at Cestyll Gardens, Cafnan House, and Simddaa-Wen.

The summer surveys in 2015 comprised a visit to the Cafnan Wildlife Tower and Wildlife Barn at Caerdegog Isaf only. This was part of monitoring in order to record and ring any barn owl chicks present.

## 2.2.3 Vantage Point Survey

A building at Caerdegog Isaf was previously identified as having potential to support roosting and breeding barn owls in 2014 (Jacobs, 2014a). The tenant informed Jacobs ecologists that barn owls had been seen at least twice using the building for roosting. On 26 June 2014 surveyors were positioned outside of the building and watched for any owls flying in or out of the building and foraging or commuting in the area. Surveys were completed one hour before sunset until the conditions became too dark for accurate identification of any birds seen.

## 2.3 Limitations

There were four properties where no surveys have taken place in the study area due to access permission not being granted in any year of survey: Nanner; Caerdegog Uchaf; Cemaes Mill; and 'Building east of Power Station'. There was also one building at Neudd which was locked at the time of survey in 2013 preventing internal inspection. It is therefore not known if there are any additional buildings used for roosting or breeding by barn owl at these properties.

However, being unable to survey these buildings is not considered to be a significant limitation. The majority of these buildings were occupied and in residential use, and in good structural condition with no obvious access points for barn owl e.g. broken windows. It is therefore considered unlikely that the properties support nesting or roosting barn owls, so the assessment of the population in the study area will not fundamentally change despite the absence of data from a small number of buildings.

## 3. Results

### 3.1 Desk Survey

The data from Cofnod showed that there are 25 records of barn owl within 2.5km of the study area between 1994 and 2013. These records are shown in figure 7.1 and detailed in appendix A.

Incidental records of barn owl sightings have also been made by ecologists working within the Wylfa Newydd Development Area between 2010 and 2014. The locations of these incidental records are shown in figure 7.1 and details are provided in appendix B.

The RSPB's Rare Bird Panel (RSPB, 2014) provided limited information for 2003, 2004 and 2005, which listed 18, 25 and 12 pairs of barn owl respectively, across Anglesey.

### 3.2 Field Survey

#### 3.2.1 Habitat Assessment

Suitable foraging habitat for barn owl was identified within the study area. These habitats included:

- field margins;
- hedgerows;
- woodland edge;
- unmanaged pasture;
- rough grassland;
- coastal grassland; and
- lowland heath.

As shown in figure 7.2, these habitats were scarce in the study area which comprised a mostly improved agricultural landscape. However, additional suitable habitats (as listed above) were also present throughout the wider landscape, beyond the study area.

No trees were found within the study area that had features with the potential to support roosting or breeding barn owl.

#### 3.2.2 Building Inspection

A number of roosting and breeding locations were identified across the study area:

- breeding site – three;
- regular roost – five;
- occasional roost – seven; and
- historical regular roost – one.

The full results of the building inspections are detailed in table 2. The location of each property is shown in figure 7.3. A reference number has been attributed to each property location and is given in brackets in the following text which can be cross-referenced with the numbering in figure 7.3.

No evidence of barn owl use was recorded in any of the three owl nest boxes.

A Wildlife Barn at Caerdegog Isaf (17a) and a Wildlife Tower at Cafnan Farm (15c), both built as mitigation for the buildings demolished for health and safety reasons, produced positive records for barn owl with an occasional roost and breeding roost, respectively. These are also detailed in table 2 and shown in figure 7.3.

Table 2: Building Inspection Survey Results<sup>3</sup>

<b>Building Number</b>	<b>Name</b>	<b>Grid Ref.</b>	<b>Description</b>	<b>2012 Survey Result</b>	<b>2013 Survey Result</b>	<b>2014 Survey Result</b>	<b>2015 Survey Result</b>	<b>Barn owl Nesting/Roosting Potential</b>	<b>Roost Status</b>
1	Plas Cemlyn	SH 33104 92804	Derelict stone barn and group of several farm buildings and outbuildings.	Not surveyed	No evidence recorded	Seen roosting	Not surveyed	Derelict stone barn provides suitable opportunities for roosting and nesting.  The other outbuildings do not provide potential.	Occasional Roost
2	Taldrwst	SH 33283 92839	Derelict stone building.	Not surveyed	Many pellets less than a month old and faecal splashes.	Not surveyed	Not surveyed	Suitable for nesting.	Regular roost
3	Tyddyn Sydney	SH 33555 92987	Residential buildings, open barn and outbuildings.	Not surveyed	Not surveyed	No evidence recorded	Not surveyed	Open barn with potential to support roosting and nesting.	No evidence of use by barn owl
4	Neuadd	SH 33558 92464	Several residences and courtyard with accompanying outhouses.	Not surveyed	One pellet found in one of the outhouses that was several months old.	Not surveyed	Not surveyed	The outhouse used as an occasional roost. Suitable for nesting.  The other outhouses at the site were suitable for roosting and nesting but no evidence was recorded.	Occasional roost
5	Capel Siloam	SH 33429 92390	Chapel and converted residential buildings.	Not surveyed	Not surveyed	No evidence recorded	Not surveyed	Access point in one outbuilding. Potential for roosting. Breeding unlikely due to high human disturbance.	No evidence of use by barn owl

<sup>3</sup> Where there is no data available, this indicated by a dash “-“.

<b>Building Number</b>	<b>Name</b>	<b>Grid Ref.</b>	<b>Description</b>	<b>2012 Survey Result</b>	<b>2013 Survey Result</b>	<b>2014 Survey Result</b>	<b>2015 Survey Result</b>	<b>Barn owl Nesting/Roosting Potential</b>	<b>Roost Status</b>
6	Nanner	SH 33612 92006	Not surveyed	Not surveyed	Not surveyed	Not surveyed	Not surveyed	-	Unknown
7	Pen Carreg	SH 33885 93128	A residence with several outhouses and one barn to the north-west of the residential property.	Not surveyed	Barn – many faecal splashes on beam faces with many pellets up to eight months old scattered below the beams.	Not surveyed	Not surveyed	Barn had potential to support nesting and roosting barn owls. Other buildings with potential to provide roosting and nesting opportunities. However, no signs have been found.	<b>Regular roost</b>
8	Swn y Mor	SH 33875 92972	A large barn with several areas for storing hay/straw bales and cattle shed.	Not surveyed	No evidence recorded	Not surveyed	Not surveyed	Potential to provide suitable nest and roost sites when straw/hay bales are present.	No evidence of use by barn owl
9	Mynydd-Ithel	SH 34112 92073	Farm consisting of several outhouses and horse stables.	Not surveyed	Storage shed – 10 plus pellets up to eight months old.  Outhouse – four pellets between one and eight months old.	Not surveyed	Not surveyed	Other outhouses used for storage of hay were suitable for roosting and nesting. However, no evidence of field signs were found.	<b>Regular roost</b> (Storage shed)  <b>Occasional roost and Breeding site</b> (disused chimney stack)
10	Caerdegog Uchaf	SH 34196 91740	Not surveyed	Not surveyed	Not surveyed	Not surveyed	Not surveyed	-	Unknown

<b>Building Number</b>	<b>Name</b>	<b>Grid Ref.</b>	<b>Description</b>	<b>2012 Survey Result</b>	<b>2013 Survey Result</b>	<b>2014 Survey Result</b>	<b>2015 Survey Result</b>	<b>Barn owl Nesting/Roosting Potential</b>	<b>Roost Status</b>
11	Felin Gafnan	SH 34386 93301	A residence with an outhouse.	Not surveyed	No evidence recorded	Not surveyed	Not surveyed	The outhouse was suitable for roosting and nesting. The residence was completely sealed allowing no access to barn owls.	No evidence of use by barn owl
12	Old Mill (Felin Cafnan)	SH 34480 93356	An old mill and storage outhouse owned by the National Trust.	No evidence recorded	No evidence recorded	Not surveyed	Not surveyed	Both the old mill and outhouse were suitable for roosting and nesting.	No evidence of use by barn owl
13	Cestyll Gardens	SH 34535 93256	A disused pump house at the southern end of the gardens that has become overgrown.	Roosting evidence	10 plus pellets many years old.	Not surveyed	Not surveyed	Not used for some time, probably due to the denseness of the surrounding vegetation. Suitable for nesting if a clear flight line was available.	<b>Historical regular roost</b>
13a	Cestyll Garden – Nest Box	SH 34502 93364	Barn owl box belonging to the Hawk and Owl Trust – situated at the northern end of Cestyll Gardens.	No evidence recorded	No evidence recorded	Not surveyed	Not surveyed	Suitable for nesting and roosting – although needs minor repair.	No evidence of use by barn owl
14	Pont Cafnan	SH 34322 93111	Three stone barns: one operational, one a ruin and the third derelict.	Roosting evidence	Operational Building – many pellets less than three months old and faecal splashes evident below the beams.	Not surveyed	Not surveyed	Operational building – low potential for a nesting site.  The derelict and ruined buildings were suitable as a short term roost site.	<b>Regular roost</b>

<b>Building Number</b>	<b>Name</b>	<b>Grid Ref.</b>	<b>Description</b>	<b>2012 Survey Result</b>	<b>2013 Survey Result</b>	<b>2014 Survey Result</b>	<b>2015 Survey Result</b>	<b>Barn owl Nesting/Roosting Potential</b>	<b>Roost Status</b>
15	Cafnan Farm	SH 34381 93019	Farm buildings consisting of two operational large A-frame barns and several stone outhouse buildings.	Roosting evidence	Cattle Shed – three pellets up to eight months old were present with several faecal splashes. A barn owl was disturbed from a roost perch within the building.  Storage Shed – building adjacent to the roost site has a chimney which is suitable for nesting.	Not surveyed	Not surveyed	Cattle shed – suitable for roosting. Not suitable for nesting.  Other buildings – suitable for nesting.	Occasional roost (Cattle Shed)
15a	Cafnan House	SH 34262 93067	Residence and outbuildings.	Breeding roost	An adult barn owl was seen emerging from the chimney stack. At least one owlet has been observed exercising its wings on the chimney at this location. It has been seen several times so could be more than one bird.	Not surveyed	Not surveyed	Confirmed nesting and roosting site.	Breeding site (Disused chimney stack)
15b	Cafnan House – Nest Box	SH 342 930	Nest Box in garden	No evidence recorded	Not surveyed	Not surveyed	Not surveyed	Potential for roosting and nesting.	No evidence of use by barn owl

<b>Building Number</b>	<b>Name</b>	<b>Grid Ref.</b>	<b>Description</b>	<b>2012 Survey Result</b>	<b>2013 Survey Result</b>	<b>2014 Survey Result</b>	<b>2015 Survey Result</b>	<b>Barn owl Nesting/Roosting Potential</b>	<b>Roost Status</b>
15c	Cafnan Farm – Wildlife Tower	SH 34328 93055	Wildlife Tower built as mitigation in 2013.	-	-	Breeding pair – five chicks	Breeding pair – three chicks	Nesting and roosting confirmed	<b>Breeding Roost</b>
16	Pennant	SH 34752 93077	Residential building and outbuilding.	Not surveyed	Demolished	-	-	-	Demolished
17	Caerdegog Isaf	SH 34753 92478	Several apartments in two complexes. One large barn and one small outhouse in courtyard.	Not surveyed	Not surveyed	No evidence recorded	Not surveyed	None – buildings sealed. One large barn with no potential to support roosting or nesting barn owls.	No evidence of use by barn owl
17a	Caerdegog Isaf – Wildlife barn	SH 34789 92495	Existing barn converted as ecological mitigation.	Not surveyed	Not surveyed	Anecdotal evidence of barn owl presence	Nesting jackdaws recorded	Potential for roosting and breeding.	<b>Occasional roost</b>
18	Tan yr Allt	SH 34946 93153	Residential and outbuilding.	No evidence recorded	Demolished	-	-	-	Demolished
19	Rhwng Dau fynydd	SH 35065 92827	Residential and outbuildings.	No evidence recorded	Demolished	-	-	-	Demolished
20	Tyddyn-Gele	SH 35090 92579	Residence with a courtyard and several outhouses.	Not surveyed	Two pellets – one very fresh in outhouse.	Not surveyed	Not surveyed	Outhouse has limited suitability for nesting.  Other buildings were not suitable for nesting or roosting.	<b>Occasional roost</b>

<b>Building Number</b>	<b>Name</b>	<b>Grid Ref.</b>	<b>Description</b>	<b>2012 Survey Result</b>	<b>2013 Survey Result</b>	<b>2014 Survey Result</b>	<b>2015 Survey Result</b>	<b>Barn owl Nesting/Roosting Potential</b>	<b>Roost Status</b>
21	Groes-fechan	SH 34983 91684	Group of houses with two large outhouses to the west of the residences and a small potting shed in the garden to the south.	Not surveyed	None	Not surveyed	Not surveyed	Outbuilding – suitable for roosting however the buildings have limited opportunity for an owl to access.  Small potting shed – roosting and nesting opportunities, however there is poor access due to surrounding vegetation.	No evidence of use by barn owl
22	Tai-hirion	SH 35077 93298	Residential house and barn.	Roosting evidence in barn	Roosting evidence in barn	Demolished	-	-	Demolished
23	Simdda-Wen Nest Box	SH 35137 93327	A barn owl box situated to the west of the demolished Simdda-wen.	None	Owl evidence recorded – most likely to be tawny owl ( <i>Strix aluco</i> ).	Not surveyed	Not surveyed	Suitable for nesting and roosting.	No evidence of use by barn owl
24	The Firs	SH 35185 93001	A remaining storage shed to the north-west of the demolished buildings at 'The Firs'.	Signs of Use	Twenty plus pellets and splashes – many pellets less than a month old, some up to 21 months old.	Not surveyed	Not surveyed	Suitable for nesting and roosting.	<b>Regular roost</b>
25	The Firs – air raid shelter	SH 35287 92917	Air raid shelter	Signs of Use	Demolished	-	-	-	Demolished
26	Unnamed	SH 35374 92890	Residential building	No evidence recorded	Not surveyed	Not surveyed	Not surveyed	No potential to support nesting or roosting.	No evidence of use by barn owl

<b>Building Number</b>	<b>Name</b>	<b>Grid Ref.</b>	<b>Description</b>	<b>2012 Survey Result</b>	<b>2013 Survey Result</b>	<b>2014 Survey Result</b>	<b>2015 Survey Result</b>	<b>Barn owl Nesting/Roosting Potential</b>	<b>Roost Status</b>
27	Penrallt	SH 35348 92598	Residential house and barn.	Signs of use in barn	Demolished	-	-	-	Demolished
28	Ty Croes	SH 35618 93482	Residential and outbuildings.	No evidence recorded	Demolished	-	-	-	Demolished
29	Tyddyn-Goronwy	SH 35843 93246	Residential house	No evidence recorded	Not surveyed	Not surveyed	Not surveyed	None	No evidence of use by barn owl
30	Unnamed	SH 35764 92959	Agricultural building	No evidence recorded	Demolished	-	-	-	Demolished
31	Gwyddelyn Bach – House	SH 36002 92850	House	Not surveyed	No evidence recorded	Not surveyed	Not surveyed	None	No evidence of use by barn owl
32	Gwyddelyn Bach – Outbuildings	SH 36002 92850	Barn and two small outhouses.	Not surveyed	No evidence recorded	Not surveyed	Not surveyed	Limited access point to outhouses. Potential to roost in barn.	No evidence of use by barn owl
33	Foel Fawr	SH 35760 91969	Group of large barns, mainly steel and wood construction.	Not surveyed	No evidence recorded	Not surveyed	Not surveyed	Limited opportunities for roosting.	No evidence of use by barn owl
34	Tre'r Gof	SH 36259 93205	A farm with three barns used for sheep shearing and sheltering livestock.	Not surveyed	No evidence recorded	Not surveyed	Not surveyed	Suitable for roosting but with limited opportunities. No opportunities for nesting.	No evidence of use by barn owl

<b>Building Number</b>	<b>Name</b>	<b>Grid Ref.</b>	<b>Description</b>	<b>2012 Survey Result</b>	<b>2013 Survey Result</b>	<b>2014 Survey Result</b>	<b>2015 Survey Result</b>	<b>Barn owl Nesting/Roosting Potential</b>	<b>Roost Status</b>
35	Cefn Helyg	SH 36517 92762	Residential and outbuildings.	Not surveyed	Not surveyed	No evidence recorded	Not surveyed	Residential buildings sealed with two open storage buildings with potential for roosting but unsuitable for breeding.	No evidence of use by barn owl
36	Cemaes Mill	SH 36648 92664	Not surveyed	Not surveyed	Not surveyed	Not surveyed	Not surveyed	-	Unknown
37	Tre'r Gof – Isaf	SH 36625 93536	Several stables, a barn used for livestock and several outbuildings, some housing chickens.	Not surveyed	No evidence recorded	Not surveyed	Not surveyed	The stables and out buildings were suitable for roosting.  Limited opportunities for nesting.	Demolished
38	Building east of Power Station	SH 35513 93885	Not surveyed	Not surveyed	Not surveyed	Not surveyed	Not surveyed	-	Unknown
39	Park Lodge	SH 36417 93525	A large lodge, outhouses and stables.	Not surveyed	No evidence recorded	Not surveyed	Not surveyed	The outhouses and stables are suitable for roosting.  Limited opportunities for nesting.	Demolished
40	Gardener's Cottage	SH 34672 93376	Residential building	Roosting material identified	Not surveyed	Not surveyed	Not surveyed	Potential for both roosting and nesting.	<b>Occasional roost</b>

### **3.2.3 Vantage Point Surveys**

The vantage point survey at Caerdegog Isaf (17) did not record barn owl presence or activity at the specific building under direct observation. However, hissing, which is a noise characteristic of breeding barn owls, was heard from the Wildlife Barn (17a) at the same property to the north-east of the building under direct observation. As survey efforts were concentrated on Building 17 and not the barn, presence of barn owl in the barn could not be confirmed during the survey.

## 4. Discussion

Barn owls are not territorial birds as their foraging areas of between 1km in summer and 3km in winter are too large to successfully defend (Barn Owl Trust, 2010). The species is particularly sedentary and regular in their habitats which results in barn owls tending not to leave their home ranges. Once established, these home ranges usually consist of one breeding site, one or two roosting sites and a few additional sites for occasional roosting and often overlap with the home ranges of other pairs of barn owl.

Four to seven eggs are laid in each clutch by a breeding pair. Of these, approximately three are usually successful. The chicks then leave the parental home range at approximately 14 weeks with an average dispersal of around 12km.

The results of the barn owl surveys undertaken in the study area appear to concur with the established literature with confirmed breeding sites located at a distance of at least 1km apart. The roost sites also appear to be associated with habitat identified as being suitable to support barn owls with noticeable absences of historical records or survey data in the east of the study area where minimal suitable habitats were recorded during the habitat assessment survey.

Pairs of breeding barn owl were recorded at:

- Cafnan Farm Wildlife Tower (15c);
- Cafnan House (15a); and
- Mynydd-Ithel (9).

It is considered likely that the pair breeding at Cafnan Farm Wildlife Tower (15c) in 2014 is the same pair that was breeding at Cafnan House (15a) in 2013. The number of breeding pairs in 2014 has therefore not increased from the two pairs recorded in 2013.

When comparing the number of barn owl pairs in the study area with the most recent figures for breeding pairs across Anglesey, it can be seen that the study area supports a significant proportion of the barn owl breeding population on Anglesey. This is because the study area potentially contributes between 8% and 17% of the total island population based on 12 pairs recorded across Anglesey (2005) and 25 pairs (2004), but is only 1% of the total landmass. However, it must be noted that the figures for the whole of Anglesey are over ten years old and so recent changes in population numbers or trends will not have been reflected.

The two breeding pairs within the study area are therefore likely to form an important part of the overall breeding population on the island.

## 5. Conclusions and Recommendations

Suitable habitat for barn owl was present within the study area, although it is not particularly widespread. No trees suitable to support breeding barn owl were recorded in the study area, but a number of roosting and breeding locations were identified across the study area:

- breeding site – three;
- regular roost – five;
- occasional roost – seven; and
- historical regular roost – one.

Two pairs of barn owl were considered to be breeding within the study area (up to 2014).

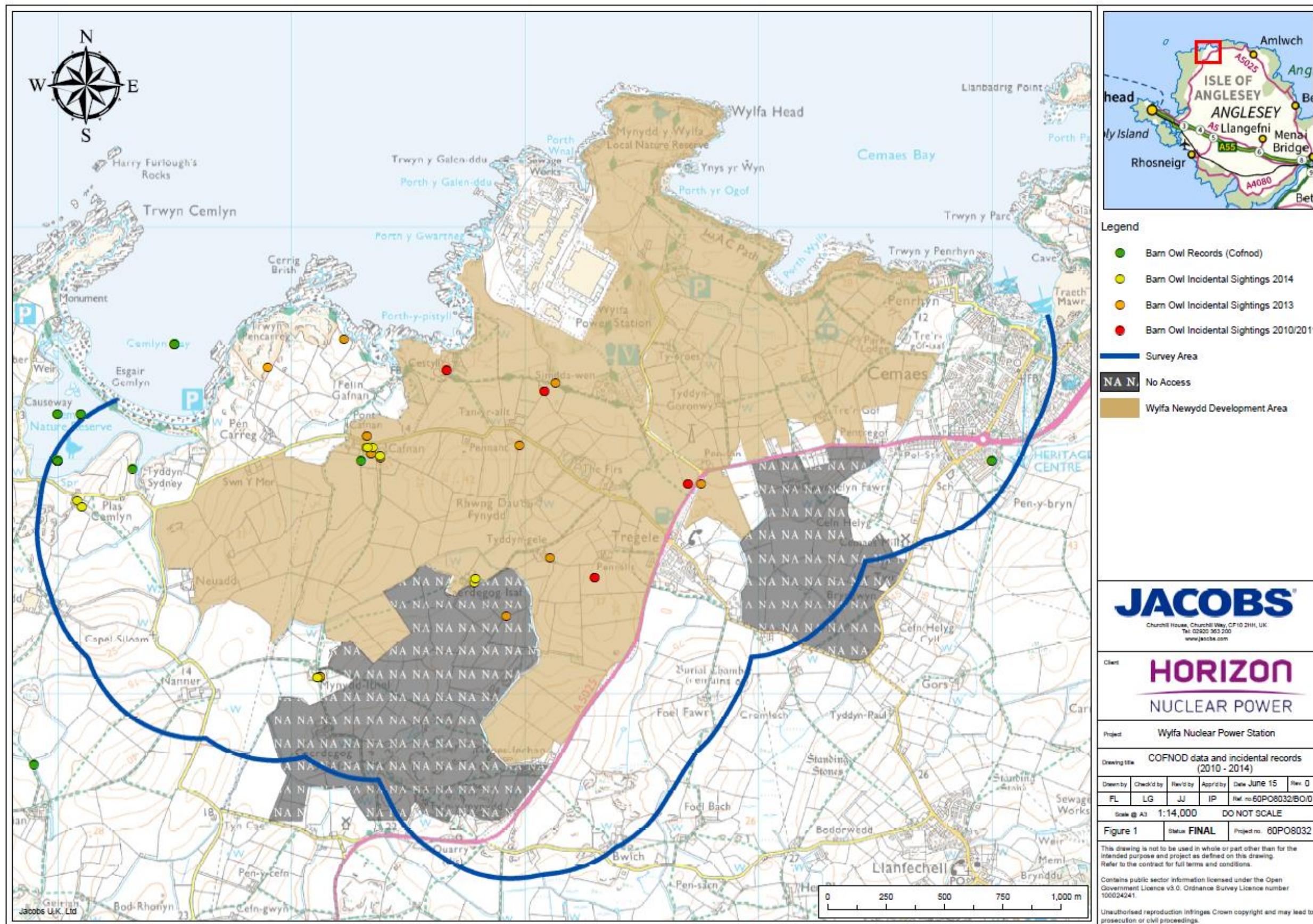
It can be concluded that the wildlife tower mitigation at Cafnan Farm (15c) has been a success, and could be used as a template for further barn owl mitigation. Further survey work to establish likely impacts on barn owl as a result of the Project is not considered to be necessary. However, should the buildings not subject to survey be affected, pre-works inspections would need to be completed to comply with relevant wildlife protection legislation.

## 6. References

- Arup. 2011. *Wylfa Winter Bird Survey 2010, 2011*. Unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd.
- Arup. 2012. *Breeding Bird Survey Report 2012*. Unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd.
- Arup. 2012a. *Breeding Bird Surveys 2010 and 2011*. Unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd.
- Arup. 2013. *Wintering Bird Report 2012, 2013*. Unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd.
- Barn Owl Trust. 2010. *About the Barn Owl – Leaflet 33* [[http://www.barnowltrust.org.uk/content\\_images/pdf/About\\_the\\_Barn\\_Owl\\_33.pdf](http://www.barnowltrust.org.uk/content_images/pdf/About_the_Barn_Owl_33.pdf)] Accessed May 2015.
- Barn Owl Trust. 2010a. *Survey Techniques – Leaflet 8* [[http://www.barnowltrust.org.uk/content\\_images/pdf/Survey\\_Techniques\\_8.pdf](http://www.barnowltrust.org.uk/content_images/pdf/Survey_Techniques_8.pdf)] Accessed May 2015.
- Barn Owl Trust. 2012. *Barn Owl Conservation Handbook*. Pelagic Publishing, Exeter.
- Chartered Institute of Ecology and Environmental Management. 2006. *Guidelines for Ecological Impact Assessment*. CIEEM, Winchester.
- Jacobs. 2013. *Consultancy Report - Barn Owl Baseline Surveys 2013*. Unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd. Ref. W202.01-S5-PAC-REP-00020.
- Jacobs. 2013a. *Consultancy Report - Breeding Bird Baseline Survey Report 2013*. Unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd. Ref. W202.01-S5-PAC-REP-00016.
- Jacobs. 2014. *Consultancy Report - Breeding Bird Survey Baseline Report 2014*. Unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd. Ref. WN03.01.01-S5-PAC-REP-00012.
- Jacobs. 2014a. *Consultancy Report - Barn Owl Baseline Surveys 2014*. Unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd. Ref. WN03.01.01-S5-PAC-REP-00013.
- Jacobs. 2014b. *Consultancy Report - Wintering Bird Survey Baseline Report 2013/14*. Unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd. Ref. W202.01-S5-PAC-REP-00017.
- Jacobs. 2015. *Consultancy Report - Wintering Birds Survey Baseline Report 2014/15*. Unpublished report on behalf of Horizon Nuclear Power (Wylfa) Ltd. Ref. WN03.01.01-S5-PAC-REP-00016.
- Royal Society for the Protection of Birds. 2014. RBBP Reports online [<http://www.rbbp.org.uk/rbbp-online-reports.php>] Accessed October 2014.
- Shawyer, C.R. 2011. *Barn Owl Tyto alba Survey Methodology and Techniques for use in Ecological Assessment. Developing Best Practice in Survey and Reporting*. IEEM, Winchester.

## **7. Figures**

This page has been left blank.



**Figure 7.1 Cofnod Data and Incidental Records (2010-2014)**

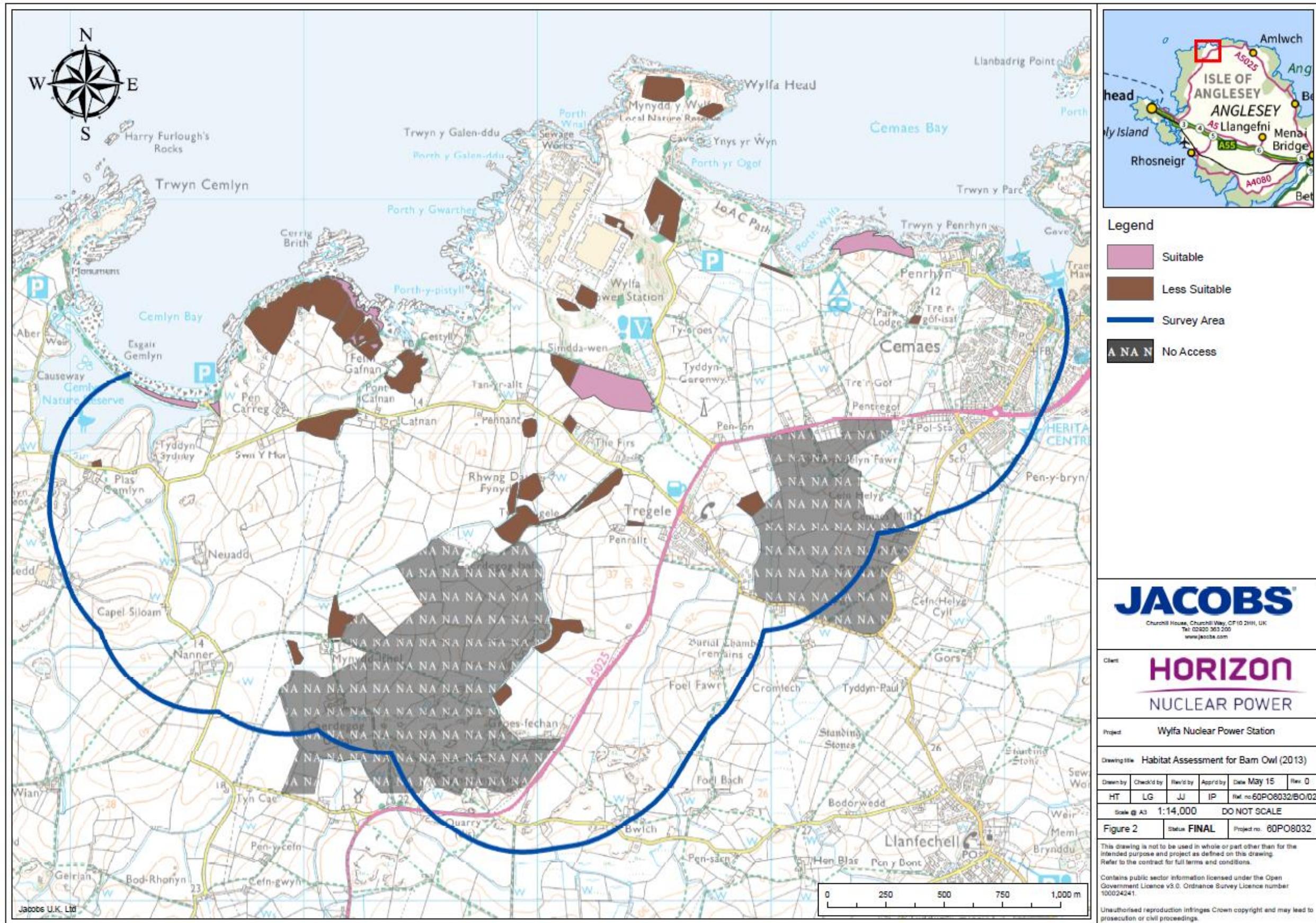


Figure 7.2 Habitat Assessment for Barn Owl (2013)

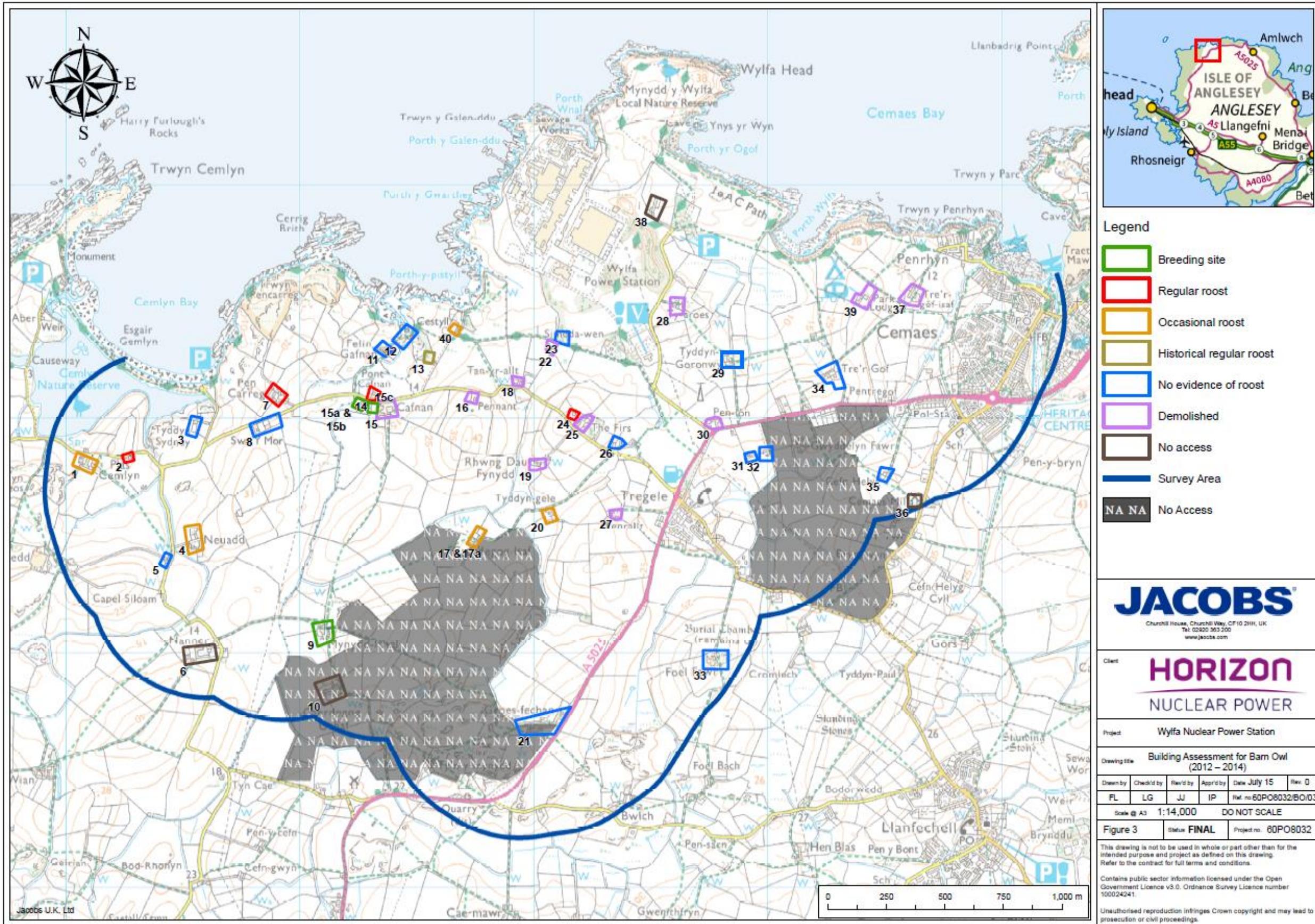


Figure 7.3 Building Assessment for Barn Owl (2012-2014)

## Appendix A. Cofnod Data

<b>Scientific Name</b>	<b>English Name</b>	<b>Grid Reference</b>	<b>Location</b>	<b>Date</b>	<b>Abundance</b>	<b>Comments</b>
<i>Tyto alba</i>	Barn Owl	SH329917	-	2005 approx.	-	-
<i>Tyto alba</i>	Barn Owl	SH330932	Cemlyn	2003	1 Pair, 2 Juveniles	Not seen by the wardens but a pair nested at Cafnan and successfully fledged two young.
<i>Tyto alba</i>	Barn Owl	SH330932	Cemlyn	12/07/2002	-	On July 12 at around 00:30 one flew low past Tyddyn Sydney.
<i>Tyto alba</i>	Barn Owl	SH330932	Cemlyn	2008	-	Seen on two occasions hunting in the evening at the back of Plas Cemlyn Farm.
<i>Tyto alba</i>	Barn Owl	SH331932	Cemlyn NWWF Reserve	11/05/2013	-	-
<i>Tyto alba</i>	Barn Owl	SH3332292965	Cemlyn	12/06/2010	1	-
<i>Tyto alba</i>	Barn Owl	SH335935	Cemlyn	14/05/2007	1	Feeding young.
<i>Tyto alba</i>	Barn Owl	SH335935	Cemlyn	02/06/2007	1	Feeding young.
<i>Tyto alba</i>	Barn Owl	SH335935	Cemlyn	07/06/2007	1	Feeding young.
<i>Tyto alba</i>	Barn Owl	SH3393	Cemlyn	Spring 1993 – Summer 1993	1	Seen hunting in the fields towards Tregele.
<i>Tyto alba</i>	Barn Owl	SH3393	Cemlyn; Hen Blas	24/05/1994	1	Seen by Mr Jones coming out of stone barns at about midday.
<i>Tyto alba</i>	Barn Owl	SH3393	Cemlyn; Tregele	1994	1	Reported by Javen Healy hunting in fields.
<i>Tyto alba</i>	Barn Owl	SH3393	Cemlyn	Spring 1991 – Summer 1991		Not seen on the reserve itself, but hunting barn owls were recorded on a number of occasions in the fields between Tregele and Wylfa.
<i>Tyto alba</i>	Barn Owl	SH3393	Cemlyn	24/05/2006	1	One seen at dusk on 24 May at Cafnan. A visitor reported seeing a bird at the chimney stack in the yard here, the traditional nesting site, but believed they had been evicted by jackdaws ( <i>Coloeus monedula</i> ).
<i>Tyto alba</i>	Barn Owl	SH3393	Cemlyn	13/07/2007	1 Adult/1 Juvenile	Bred at Cafnan with an adult first seen by the wardens on 13 July. It was seen the following evening at around 21:05 hunting in nearby fields and whenever trips were made to see them.

<b>Scientific Name</b>	<b>English Name</b>	<b>Grid Reference</b>	<b>Location</b>	<b>Date</b>	<b>Abundance</b>	<b>Comments</b>
<i>Tyto alba</i>	Barn Owl	SH3393	Cemlyn	31/07/2007	2 Juvenile	The eerie screech was also heard and two fledged young were seen perched on top of the chimney at Cafnan and heard hissing on the 31 July.
<i>Tyto alba</i>	Barn Owl	SH3393	Cemlyn	2005	1 Pair	A pair is thought to have nested again at Cafnan farm, towards Tregele.
<i>Tyto alba</i>	Barn Owl	SH3393	Cemlyn	21/05/2005 – 22/05/2005	1 Adult	An adult was seen hunting at dusk on 21 and 22 May.
<i>Tyto alba</i>	Barn Owl	SH3393	Cemlyn	2004	1 Pair	A pair is thought to have nested again at Cafnan farm, towards Tregele.
<i>Tyto alba</i>	Barn Owl	SH3393	Cemlyn	06/08/2004	1 Adult	An adult was seen hunting on the 6 August and the following day at a similar time period, around 9pm.
<i>Tyto alba</i>	Barn Owl	SH3393	Cemlyn	24/05/2012	1	-
<i>Tyto alba</i> subsp. <i>guttata</i>	Dark-breasted Barn Owl	SH3393	Cemlyn	Spring 1998 – Summer 1998	1	Recorded in the early morning flying over area.
<i>Tyto alba</i>	Barn Owl	SH343930	Cemlyn; Cafnan Farm	26/07/2001		Visitors staying at Cafnan farm reported a family of barn owls nesting in an old chimney stack on the farm.
<i>Tyto alba</i>	Barn Owl	SH3793	Cemaes	17/01/2002	1	Hunting over A5025.
<i>Tyto alba</i>	Barn Owl	SH3793	Cemaes Bay	17/03/2006	1	-

## Appendix B. Incidental Records

Date	Grid Reference	Location	Comments
<b>2010/2011</b>			
2010/2011	SH 34666 93388	Gardener's Cottage	Barn owl emerged from chimney
2010/2011	SH 35085 93296	Tai-Hirion Barn	Barn owl roost in barn
2010/2011	SH 357929	South west of Pen-lon	Seen in flight
2010/2011	SH 353 925	Penrallt	Seen in flight
<b>2012 - None</b>			
<b>2013</b>			
26 June 2013	SH 339 934	Point CG - Coastal grassland	Seen in flight during point count for coastal grassland
<b>2014</b>			
June 2014	SH 34789 92495	Caerdegog Wildlife barn	Barn owl seen in entrance to building
June 2014	SH 34328 93055	Cafnan Farm Wildlife Tower	Owl chicks heard
June to August 2014	SH 34112 92073	Mynydd Ithel	Breeding barn owls seen – adults returning to nesting site with food items.
June to August 2014	SH 34381 93019	Cafnan Farm	Owlet seen on chimney
July 2014	-	Transect 4	Seen in flight during breeding bird survey
July 2014	-	Transect 5	Seen in flight during breeding bird survey

Date	Grid Reference	Location	Comments
25 July 2014	SH 34381 93019	Cafnan Farm	Roosting
26 July 2014	SH 33104 92804	Plas Cemlyn	Roosting
30 September 2014	-	Cemaes Turning – Amlwch side of A5025	Single bird flying towards Cemaes
<b>2015</b>			
23 June 2015	-	Cafnan Farm	Two juvenile birds on wall of Cafnan Farm – believed to be fledged chicks from the Wildlife Tower.

PWER NIWCLEAR

**HORIZON**

NUCLEAR POWER

**CONTACT US:**

If you have any questions or feedback regarding the Wylfa Newydd Project you can contact us on our dedicated Wylfa Newydd freephone hotline and email address, by calling on **0800 954 9516** or emailing [wylfaenquiries@horizonnuclearpower.com](mailto:wylfaenquiries@horizonnuclearpower.com)

---

Horizon Nuclear Power  
Sunrise House  
1420 Charlton Court  
Gloucester Business Park  
Gloucester, GL3 4AE

T +44 (0)1242 508508

[www.horizonnuclearpower.com](http://www.horizonnuclearpower.com)

---

All material in this document is, unless specified otherwise, copyright of Horizon Nuclear Power Wylfa Ltd and may not be reproduced without prior permission. Any unauthorised use or copying of the material may violate trademark, copyright and other proprietary rights and civil and criminal statutes. The material shall not be used in any manner that infringes any trademark, copyright or other proprietary rights and Horizon Nuclear Power Wylfa Ltd reserves all rights with respect to such unauthorised use.