PROJECT N^{O} 62103859-300

COSMESTON FARM

EXTENDED PHASE 1 HABITAT ASSESSMENT

NON-CONFIDENTIAL

APRIL 2016

WSP | PARSONS BRINCKERHOFF

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Welsh Assembly Government

Version 1.0
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Project no: 62103859-300
Date: April 2016

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QUALITY MANAGEMENT

ISSUE/REVISION	FIRST ISSUE	REVISION 1	REVISION 2	REVISION 3
Remarks				
Date	18/04/2016			
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Project number	62103859-300			
Report number				
File reference	Cosmeston Farm Extended Phase 1 Habitat Assessment			

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1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

1.1.1 WSP | Parsons Brinckerhoff (WSP | PB) was commissioned by Welsh Assembly Government to undertake an Extended Phase 1 Habitat Assessment as part of a due diligence exercise for potential development at Cosmeston Farm, south of Penarth, south Wales.

1.2 METHODOLOGY

1.2.1 An Extended Phase 1 Habitat Assessment was conducted of the survey area on 8th March 2016. The purpose of the survey was to assess the ecological value of the survey area, recording any protected or otherwise important habitats and any evidence/potential for notable or protected species. The survey was carried out on land owned by Welsh Assembly Government and managed by a single land owner and extended up to 100 m outside the redline boundary (refer to Figure 1) where access and visibility allowed.

1.2.2 The survey was conducted using best practice guidance as listed below in Section 3.

1.2.3 A desk study was undertaken to collate data of protected and notable species; the search area included a radius of up to 2 km from the centre of the survey area for all protected and notable species, except bats which were searched for within a radius of 10 km and non-native invasive species which were searched for within a radius of 0.5 km. The desk based study also included a search within a 2 km radius for non-statutory and statutory designated sites.

1.3 RESULTS

1.3.1 The 2016 desk study identified four statutory designated sites and seven non-statutory protected sites within 2 km of the survey area (refer to Figure 2 and Figure 3.) Sites identified include the River Severn which is a designated Special Area of Conservation (SAC), Special Protection Area (SPA), Site of Special Scientific Interest (SSSI) and Ramsar site, which is designated for estuarine habitat and the ability to support large populations of overwintering waders, waterfowl and migratory fish species.

1.3.2 The desk study also identified a large number of species records within the search area including 15 mammal species, 140 bird species, three amphibian species, 11 invertebrate species and 12 plant species. Six invasive species were recorded within 0.5 km of the survey area.

1.3.3 The field survey identified the presence of or potential for the following species within the survey area:

[redacted]

- Dormouse (*Muscardinus avellanarius*);
- Bats;
- Breeding birds;
- Reptiles;
- Great crested newt (GCN) (*Triturus cristatus*); and
- Invasive non-native flora species.

1.3.4 Field survey findings are shown in Figure 4.

1.4 RECOMMENDATIONS

1.4.1 From the Extended Phase 1 Habitat Assessment, it is recommended that the following Phase 2 ecological survey types are undertaken to inform potential impacts and suitable mitigation and compensation measures in light of any potential development:

- [redacted]
- Dormouse nest tube surveys throughout suitable scrub and woodland habitats;
- Bats: Preliminary Bat Roost Assessment (PBRA) of buildings and trees; activity transect surveys; and static monitoring surveys;
- Breeding bird surveys and pre-works checks for breeding birds prior to any vegetation clearance undertaken between March and September, inclusive;
- Barn owl (*Tyto alba*):an assessment to be made of suitability of buildings within the survey area for nesting barn owls simultaneously with PBRA for roosting bats;
- Reptile surveys throughout areas of scrub, rubble and potential basking sites; and
- Great crested newt surveys of up to four ponds within the survey area and ponds in close proximity at Cosmeston Lakes Country Park within 500 m of the red line boundary. Great crested newt eDNA surveys of smaller ponds within 500 m of the survey area **if Phase 2 surveys commence after mid-May** to determine potential presence and requirements for full population assessment.

1.4.2 It is recommended that the following be considered in addition to the above depending upon the nature of any potential development.

- It is highly likely that a Habitat Regulations Screening Assessment will be required to assess the potential for likely significant effects to the Severn Estuary SPA/SAC/Ramsar. It is recommended that this is undertaken if development proposals are progressed;
- Wintering birds are a key feature of the Severn Estuary SPA which may be affected by urbanisation and recreational activity which are cited as “threats” (negative impacts with high effect);
- Phase 2 National Vegetation Classification (NVC) Habitat Survey of surrounding habitats of interest such as woodland, marshy grassland and basic flush mosaic habitats, in particular Ty-r-Orsaf Site of Importance for Nature Conservation (SINC). These were found within 100 m of the survey area and should any potential development be deemed to have a potential indirect impact on the integrity of these habitats then a detailed habitat survey will be required;
- Invertebrate surveys of habitats of interest such as woodland and marshy grassland mosaic habitats, in particular the Ty-r-Orsaf SINC. These habitats found within 100 m of the survey area are floristically diverse and have potential to support a wide range of terrestrial invertebrate species. Should any potential development be deemed to have a potential indirect impact on the integrity of these habitats then a targeted invertebrate survey of these habitats will be required; and
- Creation of a Method Statement regarding *Montbretia* in the event any potential development is likely to affect this species.

2 PROJECT BACKGROUND

2.1 PROJECT BACKGROUND

2.1.1 WSP | PB was commissioned by WAG to undertake an Extended Phase 1 Habitat Assessment as part of a due diligence exercise for potential development at Cosmeston Farm, Penarth, south Wales. The assessment included identification of any designated sites or habitats that could be affected by any potential development and the presence or potential presence of protected and/or otherwise notable species of conservation interest. Potential effects on ecological features were explored and requirements for further ecological works recommended where applicable.

2.2 SURVEY AREA CONTEXT

2.2.1 Cosmeston Farm lies south of and adjacent to the southern extent of the town of Penarth, south Wales. It is approximately 12.5 hectares consisting of a livery yard and stables, farm buildings, horse paddocks and training areas, scrub and storage areas.

2.2.2 The survey area is bordered along the south eastern edge by a disused railway line now part-metalled for access to a storage area with the rest consisting of a woodland ride used for horse riding. There is a railway bridge in the south east of the survey area and two further bridges adjacent to the survey area at the northern and southern tips. To the west the survey area is bordered by Lavernock Road B4267 and Cosmeston Lakes Country Park and Medieval Village. The north of the survey area is bordered by residential housing at the southern edge of Penarth. The south west, south east and east of the survey area are surrounded by agricultural land.

2.3 LEGISLATION AND POLICY CONTEXT

2.3.1 Articles of wildlife and countryside legislation, planning policy guidance and references to both local and national biodiversity action plans and regional/local strategies and plans informed the scope of the survey. The key articles of relevance are listed in Table 2.3.1 below.

Table 2.3.1: Legislation and policy context

Conservation of Habitats and Species Regulations 2010 (as amended)
The Wildlife and Countryside Act 1981 (as amended) (WCA)
The Protection of Badgers Act 1992
The Countryside and Rights of Way Act 2000 (CRoW)
The Natural Environment and Rural Communities Act 2006 (NERC)
UK Post 2010 Biodiversity Framework
Technical Advice Note 5; Nature Conservation and Planning 2009)

3 METHODOLOGY

3.1 DESK STUDY

3.1.1 A desk study was carried out in April 2016 to collate and review existing ecological information, which is available in the public domain, and obtaining data held by relevant third parties. The following data was requested from the South East Wales Biodiversity Records Centre (SEWBReC):

- records of non-statutory sites designated for nature conservation value within 2 km of the survey area;
- records of legally protected and notable species (including Species of Principal Importance (SPI), and species of conservation concern) within a 2 km radius of the survey area; and
- records of bats within a 10 km radius of the survey area.

3.1.2 The respective search radii were selected based on the following guidelines:

- Chartered Institute for Ecology and Environmental Management (CIEEM) Guidelines for Preliminary Ecological Appraisal (CIEEM, 2013); and
- Bat Surveys for Professional Ecologists Good Practice Guidelines (Bat Conservation Trust, 2016).

3.1.3 All species information was reviewed considering records within the last ten years only, and with regard for the following legislation and species lists;

- The Conservation of Species and Habitat Regulations (2010), as amended;
- Wildlife and Countryside Act (1981), as amended;
- Natural Environment and Rural Communities (NERC) Act (2006);
- [redacted]
- Local Biodiversity Action Plans (BAP); and
- Birds of Conservation Concern (BoCC); Red and Amber Lists (2015) (for both UK[1] and Wales[2]).

3.1.4 The findings of the desk study have been incorporated within this report with designated sites mapped on Figures 2 and 3.

1 Eaton MA, Aebischer NJ, Brown AF, Hearn R, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (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.

2 Thorpe RI and Young A (2003) The population status of birds in Wales: an analysis of conservation concern: 2002-2007. RSPB Cymru, Cardiff.

3.2 FIELD STUDY

3.2.1 A visit to the survey area was carried out on the 8th March 2016 as part of the Extended Phase 1 Habitat Assessment. The purpose of the survey was to assess the ecological importance of the survey area, recording any protected or otherwise important habitats and any evidence/potential for notable or protected species. The survey was carried out on land owned by WAG and managed by a single land owner and extended up to 100 m outside the potential development area where access and visibility allowed.

3.2.2 The geographical extent of the survey is referred to as 'the survey area' for the remainder of this report.

3.2.3 The survey followed the methodology defined by the Joint Nature Conservation Committee (JNCC)[3]. Habitat types present were recorded on a Phase 1 habitat map and species presence/potential recorded. Plant species observed within each habitat type were recorded using species names as provided in Stace (2010)[4].

3.2.4 An informal visit was made to Cosmeston Lakes Country Park to scope out ponds within 500 m of the survey area. Photographs were taken for information.

3.3 NATURE CONSERVATION EVALUATION

3.3.1 The ecological features of the survey area have been evaluated in accordance with guidelines provided within the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment (EcIA)[5].

3.3.2 The guidance uses a geographic frame of reference for assigning importance to features of ecological importance that consists of the following categories given in the left hand column of Table 3.3.1 below. Examples of the types of features that are typically assigned to each geographic scale are given in the right hand column.

Table 3.3.1: The geographical scale at which features are assessed for nature conservation importance

GEOGRAPHICAL SCALE AT WHICH FEATURE IS IMPORTANT	EXAMPLE OF FEATURE
International and European	Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar sites.
National	Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs).
Regional	County designated wildlife sites supporting a regionally significant area of a Habitat of Principal Importance; or large population of a Species of Principal Importance or of a species of national nature conservation concern.
Metropolitan or County	Non-statutory sites designated at county level. Ancient woodlands, large areas of Habitat of Principal Importance offering a significant wildlife resource at county level. Large

3 Joint Nature Conservation Committee (20012) Handbook for Phase 1 Habitat Survey - A Technique for Environmental Audit, Joint Nature Conservation Committee, Peterborough.

4 Stace, C. A. (2000). New flora of the British Isles. Cambridge University Press.

5 CIEEM (2016) Guidelines for Ecological Impact Assessment and the Uk and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

Geographical Scale at which Feature is Important	Example of Feature
	populations of a legally protected species or species included in the UK or Local BAP or other species considered to be threatened at a national level.
District	Non-statutory sites designated at district level, Local Nature Reserves (LNRs). Moderately sized examples of Habitats of Principal Importance.
Local	Old hedges, woodlands, ponds, species rich grassland or other habitat, areas supporting small populations of protected species, species and habitats included in the Local BAP.
Important within the context of the survey area	Woodland plantations, structure planting, small areas of relatively species rich grassland or other species rich habitat that is not included in the Local BAP or Habitat of Principal Importance.
Negligible	Areas of built development, active mineral extraction or intensive agricultural land with low interest for nature conservation and little/no ability to support UK or Local BAP species or species considered threatened nationally.

3.4 SURVEY LIMITATIONS

3.4.1 The survey area was visited over the period of a single day; as such, seasonal variations could not be observed and it is likely that only a selection of all species that occur within the survey area will have been noted. However, due to the nature of the survey area (predominantly grazed horse paddocks and scrub) and the managed nature of the habitats recorded it is considered that the survey visit provides an accurate representation of the habitat types present and their potential to support protected species.

3.4.2 During the survey, the surveyor was not able to access one small area of woodland and reedbed habitat directly adjacent to the area of potential development. It was inaccessible due to electric and barbed wire fencing, however the majority of this land parcel was visible from outside and therefore it is considered a suitable assessment was made. This area is highlighted in Figure 4.

3.4.3 The surveyor was not able to access residential areas to the north and south west of the survey area.

In summary, it is considered that there are no significant limitations to the survey work, subsequent assessments or recommendations.

4 RESULTS

4.1 DESK STUDY

STATUTORY DESIGNATED SITES

4.1.1 Four statutory designated sites lie within 2 km of the survey area, details of which are summarised in Table 4.1.1 below; their locations are shown on Figure 2[6]. The results include the Severn Estuary which is designated as a Ramsar, SAC, SPA and SSSI; the primary reason for its designation is its potential to support large populations of overwintering wildfowl and migratory fish species.

Table 4.1.1: Summary of Statutory Designated Sites within 2 km of the survey area

SITE NAME	DESIGNATION	DESCRIPTION	DISTANCE AND DIRECTION FROM THE SURVEY AREA (KM)
Severn Estuary	Ramsar	**Criterion 1**: Due to immense tidal range, this affects both the physical environment and biological communities. • H1110 Sandbanks which are slightly covered by sea water all the time; • Estuaries; • Mudflats and sandflats not covered by sea water at low tide • Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)* **Criterion 3**: Due to unusual estuarine communities, reduced diversity and high productivity. **Criterion 4**: The site is important for the run of migratory fish between sea and river via estuary. Species include salmon *Salmo salar*, sea trout *S. trutta*, and sea lamprey *Petromyzon marinus*. **Criterion 8**: The fish of the whole estuarine and river system is one of the most diverse in Britain with over 110 species recorded. **Criterion 5**: peak counts in winter of waterfowl species, the assemblages are of international importance. **Criterion 6**: Species/populations occurring at levels of international importance with peak counts in winter: • tundra swan *Cygnus Columbianus bewickii* • greater white-fronted goose *Anser albifrons albifrons* • common shelduck *Tadorna tadorna* • gadwall *Anas strepera strepera* • dunlin *Calidris alpine alpine* • common redshank *Tringa totanus tetanus* Species regularly supported during the breeding	0.35 east

[6] It should be noted that mapping data was provided within 1 km of the central grid reference of the survey area.

SITE NAME	DESIGNATION	DESCRIPTION	DISTANCE AND DIRECTION FROM THE SURVEY AREA (KM)
		season: • lesser black-backed gull *Larus fuscus graellsii* Species with peak counts in spring/autumn: • ringed plover *Charadrius hiaticula* Species with peak counts in winter: • Eurasian teal *Anas crecca* • northern pintail *Anas acuta*	
	SAC	Annex I habitats that are a primary reason for selection of this site: • 1130: Estuaries • 1140: Mudflats and sandflats not covered by seawater at low tide • 1330: Atlantic salt meadows Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: • 1110: Sandbanks which are slightly covered by sea water all the time • 1170: Reefs Annex II species that are a primary reason for selection of this site: • 1095: sea lamorey *Petromyzon marinus* • 1099: river lamprey *Lampetra fluviatilis* • 1103: twaite shad *Alosa fallax*	0.35 east
	SPA	This site qualifies under **Article 4.1** of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: • Bewick's swan This site also qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: • Ringed plover (on passage) • Curlew (*Numenius arquata*) (over winter) • Dunlin (over winter) • Pintail (over winter) • Redshank (over winter) • Shelduck (over winter) The area qualifies under **Article 4.2** of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl.	0.35 east
	SSSI	The Severn Estuary lies on the south west coast of Britain at the mouth of four major rivers (the Severn, Wye, Usk and Avon) and many lesser rivers. The immense tidal range (the second highest in the world) and classic funnel shape make the Severn Estuary unique in Britain and very rare worldwide. The intertidal zone of mudflats, sand banks, rocky platforms and saltmarsh is one of the largest and most important n Britain. The estuarine fauna includes: • internationally important populations of waterfowl; • invertebrate populations of considerable interest; and • large populations of migratory fish, including the nationally rare and	0.35 east

SITE NAME	DESIGNATION	DESCRIPTION	DISTANCE AND DIRECTION FROM THE SURVEY AREA (KM)
		endangered allis shad *Alosa alosa*. The SSSI forms the major part of a larger area of estuarine habitat, which includes the Upper Severn Estuary, the Taf/Ely Estuary and Bridgwater Bay.	
Comeston Lakes/Llynnoedd Cosmeston	SSSI	The lakes are designated as a SSSI or starry stonewort *Nitellopsis obtuse*, a rare plant. The species prefers lakes between 1 and 6 m deep at low altitude calcareous waters, often near the coast.	0.11 north west
Penarth Coast	SSSI	The site includes some species rich calcareous grassland and cliff-top scrub which supports a number of plant species of limited occurrence and distribution in the former counties of mid and south Glamorgan, including Dyer's greenweed *Genista tinctoria*, butterfly orchid *Plantanthera chlorantha*, bee orchid *Ophrys apifera* and adder's tongue.	0.33 east
Cog Moors	SSSI	Cog Moors supports an extensive area of relatively unimproved species rich grassland, which was traditionally managed for hay. The site supports two species of special interest: the nationally scarce *Bulbous foxtaila* and a large population of pepper saxifrage *Silaum silaus*. The site also supports population of several species, which are uncommon in Glamorgan including brown sedge *Carex disticha*, adder's tongue *Ophioglossum vulgatum* and green-winged orchid *Orchis morio*.	1.75 north west

NON-STATUTORY DESIGNATED SITES

4.1.2 Seven non-statutory designated sites (Sites of Importance for Nature Conservation (SINCs)) were identified within 2 km of the survey area. None of these non-statutory designated sites are within the redline boundary (as provided by client on 22 February 2016). Ty-r-Orsaf SINC lies within the 100 m buffer survey area.

4.1.3 Details of the sites are summarised in Table 4.1.2 below. The locations of the Sites are presented on Figure 3[7].

Table 4.1.2: Summary of non-statutory designated sites within 2 km of the survey area

SITE NAME	DESIGNATION	DISTANCE AND DIRECTION FROM THE SURVEY AREA (KM)	DESCRIPTION
Ty-r-Orsaf	SINC	0.02 south east	A disused railway line supporting scrub and rough grassland with areas of species rich neutral and calcareous grassland.
Cosmeston Lakes/Llynnoedd Cosmeston	SINC & Country Park	0.16 north west	An extensive country park supporting a mosaic of habitats including species-rich calcareous and neutral grasslands, scrub, hedgerows, woodland, streams and ponds, which support a wide assemblage of species, including many species, listed under NERC Section 42.
Lavernock Point East	SINC &Wildlife Trust Reserve	0.41 south east	The site supports a mosaic of coastal species on a moderate to rich limestone grassland with scrub. The point is also a well-known spot for observing migratory birds.
Downs Wood	SINC	0.53 north west	An area of ancient semi-natural broadleaved woodland with areas of lowland mixed deciduous woodland.
Cogan Pond	SINC	1.05 north west	A large pond and reedbed.
Cog Moors	SINC	1.75 north west	Area of ancient semi-natural woodland with lowland mixed

SITE NAME	DESIGNATION	DISTANCE AND DIRECTION FROM THE SURVEY AREA (KM)	DESCRIPTION
			deciduous woodland. The area also contains a series of species-rich rush pastures with neutral grassland and associated wet ditches.
Pop Hill	SINC	2.0 north west	An area of predominantly ancient semi-natural broadleaved woodland with areas of lowland mixed deciduous woodland.

ANCIENT WOODLAND

4.1.4 There is one parcel of ancient woodland as listed on the Ancient Woodland Inventory AWI present within 2 km of the survey area (Downs Wood), which is also a SINC, and is mapped in Figure 3.

PROTECTED AND NOTABLE SPECIES

4.1.5 Records of protected and notable species within 2 km of the survey area are summarised in Table 4.1.3 below with bat records displayed in Table 4.1.4. Records of bird species are presented in Appendix A-5.

Table 4.1.3: Summary of protected and notable species recorded within the 2 km search area.

GRID REFERENCE (NEAREST RECORD)	COMMON NAME	SCIENTIFIC NAME	DATE (NEWEST RECORDS)	NO. OF RECORDS	CLOSEST DISTANCE (KM)	LEGAL STATUS[7]
Mammals						
ST177688	European otter	*Lutra lutra*	2010	1	0.17	EPS, HDir, W&CA, S42, UKBAP, RD1 (UK), RD2 (UK), LBAP
ST176689	Polecat	*Mustela putorius*	2008	1	0.276	HDir, S42, UKBAP, RD2 (UK), LBAP (BGW, BRG, CON, FLI, GWY, NEW, POW, SNP, VOG
ST18267037	West European hedgehog	*Erinaceus europaeus*	2011	1	1.079	S42, UKBAP, Bern, LBAP (ANG, BGW, BRG, CON, FLI, GWY, NEW, POW, RCT, VOG)
Amphibians						
ST1769	Common frog	*Rana temporaria*	2012	2	0.582	HDir, W&CA, LBAP
ST1769	Common toad	*Bufo bufo*	2015	2	0.582	W&CA, S42, UKBAP, LBAP
ST161685	Great crested newt (GCN)	*Triturus cristatus*	2013	3	1.778	EPS, HDir, W&CA, S42, UKBAP, RD1 (UK), RD2 (UK), LBAP
Plants						
ST186706	Autumn lady's-tresses	*Spiranthes spiralis*	2014	1	1.404	RD1 (UK), LBAP
ST1868	Fragrant orchid	*Gymnadenia conopsea*	2008	1	0.552	S42, LBAP
ST180679	Fritillary	*Fritillaria meleagris*	2011	1	0.835	RD1 (UK), RD2 (UK)
ST1768	Greater butterfly-orchid	*Platanthera chlorantha*	2009	1	0.561	RD1 (UK), LBAP
ST1868	Green-winged	*Anacamptis morio*	2009	1	0.552	RD1 (UK), LBAP

[7] EPS = European Protected Species, HDir = Habitats Directive, W&CA = Wildlife and Countryside Act (1981), NERC = Schedule 42 Natural Environemnt and Rural Communities Act (2006), UK BAP = UK Biodiversity Action Plan, LBAP = Local Biodiversity Action Plan, RD1 (Wales) = Welsh Red Data Book listing based on IUCN guidelines, RD1 (UK) = UK Red Data Book listing based on IUCN guidelines, RD2 (UK) = UK Red Data Book listing not based on IUCN guidelines (Nationally Rare and Scarce)

Grid Reference (nearest record)	Common Name	Scientific Name	Date (newest records)	No. of records	Closest Distance (km)	Legal Status[7]
	orchid					
ST17376747	Ivy broomrape	*Orobanche hederae*	2015	3	1.445	RD2 (UK), LBAP
ST170674	Minute pouncwort	*Cololejeunea minutissima*	2014	1	1.63	RD2 (UK)
ST167674	Nicholson's beard-moss	*Didymodon nicholsonii*	2015	4	0.109	RD2 (UK), LI(BIS)
ST179677	Service-tree	*Sorbus domestica*	2010	1	1.033	RD1 (UK), RD2 (UK), LBAP (VOG), WVP
ST175690	Starry stonewort (aquatic plant)	*Nitellopsis obtusa*	2007	8	0.381	S42, UKBAP, RD1 (UK), LBAP (VOG), LI(VC47)
ST185694	Strap-leaved earth-moss	*Ephemerum recurvifolium*	2014	1	0.313	RD1 (Wales), RD2 (UK), LI(VC45, LR), LI(VC49, LR), LI(WWBIC)
ST177689	Thatch-moss	*Leptodontium gemmascens*	2014	2	0.139	UKBAP, RD1 (UK), RD2 (UK)
Invertebrates						
ST180686	Bombus (*Thoracobombus*) *humilis*)	*Bombus (Thoracobombus) humilis*	2010	1	0.145	S42, UKBAP, LBAP
ST180679	Dingy skipper	*Erynnis tages*	2012	12	0.552	S42, UKBAP, RD1 (UK), LBAP
ST1769	Hairy dragonfly	*Brachytron pratense*	2013	7	0.582	RD2 (UK), LBAP
ST180691	Jersey tiger	*Euplagia quadripunctaria*	2015	2	0	EPS, HDir, RD2 (UK)
ST1868	L-album Wainscot	*Mythimna l-album*	2013	4	0	RD2 (UK)
ST180680	Marsh grey	*Eudonia pallida*	2014	4	0.552	RD2 (UK)
ST1778669091	Reed beetle	*Donacia bicolora*	2008	1	0.157	S42, UKBAP
ST180679	Scarce blue-tailed damselfly	*Ischnura pumilio*	2015	33	0.835	RD1 (UK), RD2 (UK), LBAP
ST18026792	Scarlet tiger	*Callimorpha dominula*	2015	2	0.735	RD2 (UK), LBAP
ST180682	Shrill carder bee	*Bombus (Thoracobombus) sylvarum*	2010	2	0.536	S42, UKBAP, RD2 (UK), LBAP
ST185682	Grayling	*Hipparchia semele*	2007	1	0.766	S42, UKBAP, RD1 (UK), LBAP

BATS

Table 2.1.4: Summary of bat species recorded within the 10 km of the search area

Grid Reference (nearest record)	Common Name	Sc entific Name	Date (newest records)	No. of records	Closest Distance (km)	Legal Status[2]
ST10306915	Brown long-eared bat	*Plecotus auritus*	2014	13	7.60	EPS, HDir, W&CA, S42 UKBAP, , RD2 (UK), LBAP
ST161686	Common pipistrelle	*Pipistrellus pipistrellus*	2015	530	0	EPS, HDir, W&CA, S42, RD2 (UK), LBAP
ST148765	Daubenton's bat	*Myotis daubentonii*	2015	48	7.98	EPS, HDir, W&CA, RD2 (UK), LBAP
ST161686	Lesser horseshoe bat	*Rhinolophus hipposideros*	2015	26	0	EPS, HDir, W&CA, S42, UKBAP, RD2 (UK), LBAP
ST161686	Leisler's Bat	*Nyctalus leisleri*	2013	6	0	EPS, HDir, W&CA, , RD2 (UK), LBAP
ST161686	Myotis sp.	*Myotis*	2015	32	1.78	EPS, HDir, W&CA, LBAP

ST176726	Nathusius's pipistrelle	*Pipistrellus nathusii*	2015	29	3.41	EPS, HDir, W&CA, RD2 (UK), LBAP
ST161686	Noctule bat	*Nyctalus noctula*	2015	63	0	EPS, HDir, W&CA, S42, UKBAP, RD2 (UK), LBAP
ST18277038	Pipistrelle sp.	*Pipistrellus*	2015	226	0	EPS, WCA5, LBAP
ST161686	Serotine	*Eptesicus serotinus*	2014	3	0	EPS, HDir, WCA5, RD2 (UK), LBAP
ST161686	Soprano pipistrelle	*Pipistrellus pygmaeus*	2015	503	0	EPS, HDir, WCA5, S42, UKBAP, RD2 (UK), LBAP
ST189712	Unspecified bat	*Chiroptera*	2015	145	2.07	EPS, WCA5, S42, LBAP
ST184701	Whiskered bat	*Myotis mystacinus*	2014	3	0.87	EPS, HDir, WCA5, RD2 (UK), LBAP

4.1.6 More than 140 species of bird have been recorded within 2 km of the survey area, many of them are on the British Birds of Conservation Concern (UKBoCC) and Welsh Birds of Conservation Concern (WBoCC) list as either red or amber species and/or listed as Schedule 1 species (W&CA, 1981) and/or species listed in Section 42 of NERC Act.

4.1.7 The majority of species recorded are listed as protected or notable. Therefore in the following table only those listed under Schedule 1 of W&CA 1981 have been included to illustrate the number of species with full nationalprotection against nesting disturbance within 2 km of the survey area. All wild birds, their nests, eggs and young, are protected by law. For a full list of bird species returned by the desk study refer to Appendix 5.

Table 4.1.5: W&CA Schedule 1 bird species recorded within a 2 km radius of the survey area.

COMMON NAME	SCIENTIFIC NAME
Northern Goshawk	*Accipiter gentilis*
Common Kingfisher	*Alcedo atthis*
Garganey	*Anas querquedula*
Greater Scaup	*Aythya marila*
Great Bittern	*Botaurus stellaris*
Lapland Longspur	*Calcarius lapponicus*
Purple Sandpiper	*Calidris maritima*
Ruff	*Calidris pugnax*
Cetti's Warbler	*Cettia cetti*
Black Tern	*Chlidonias niger*
Eurasian Marsh Harrier	*Circus aeruginosus*
Whooper Swan	*Cygnus cygnus*
Merlin	*Falco columbarius*
Peregrine Falcon	*Falco peregrinus*
Eurasian Hobby	*Falco subbuteo*
Brambling	*Fringilla montifringilla*
Great Northern Diver	*Gavia immer*
Red-throated Diver	*Gavia stellata*
Little Gull	*Hydrocoloeus minutus*
Eurasian Wryneck	*Jynx torquilla*
Mediterranean Gull	*Larus melanocephalus*
Black-tailed Godwit	*Limosa limosa*
Common Crossbill	*Loxia curvirostra*
Wood Lark	*Lullula arborea*
Common Scoter	*Melanitta nigra*
European Bee-eater	*Merops apiaster*
Red Kite	*Milvus milvus*
Whimbrel	*Numenius phaeopus*
Leach's Storm-petrel	*Oceanodroma leucorhoa*

COMMON NAME	SCIENTIFIC NAME
Osprey	*Pandion haliaetus*
Bearded Tit	*Panurus biarmicus*
Snow Bunting	*Plectrophenax nivalis*
Slavonian Grebe	*Podiceps auritus*
Black-necked Grebe	*Podiceps nigricollis*
Pied Avocet	*Recurvirostra avosetta*
Firecrest	*Regulus ignicapilla*
Wood Sandpiper	*Tringa glareola*
Common Greenshank	*Tringa nebularia*
Green Sandpiper	*Tringa ochropus*
Redwing	*Turdus iliacus*
Fieldfare	*Turdus pilaris*
Barn Owl	*Tyto alba*
Northern Pintail	*Anas acuta*

INVASIVE SPECIES

4.1.8 Six species listed as invasive non-native species under the W&CA Schedule 9, were recorded within 0.5 km of the survey area; none of the species listed (below) have been recorded within the search area:

- American mink *Neovison vison*;
- Egyptian goose *Alopochen aegyptiacus*;
- greater Canada goose *Branta Canadensis*;
- rose-ringed parakeet *Psittacula krameri*;
- ruddy duck *Oxyura jamaicensis*; and
- three-cornered garlic *Allium triquetrum*

4.2 FIELD STUDY

4.2.1 The survey area consisted mainly of Cosmeston Farm and livery yard with adjoining scrub and woodland habitats and Cosmeston Lakes Country Park on the opposite side of the bordering B4267 Lavernock Road, which bisects the western edge of the survey area. The town of Penarth borders the northern edge of the survey area. Several habitat types were recorded.

4.2.2 Table 4.2.1 lists the habitats recorded, the code for categorisation and the nature conservation evaluation. Refer to Appendix A Figure 4, the Extended Phase 1 habitat survey map, for a visual representation of the extent of these habitats.

Table 4.2.1: Phase 1 Habitat Survey results

HABITAT TYPE	DESCRIPTION	PRESENT WITHIN REDLINE BOUNDARY	PRESENT WITHIN 100 M OF RED LINE BOUNDARY	NATURE CONSERVATION EVALUATION
A1.1.1 Semi-improved broadleaved woodland	Woodland habitat 1: Broadleaved woodland with some bare ground. The majority of this habitat type is located outside the redline boundary to the south west of the survey area including within the Ty-r-Orsaf SINC. One small strip of woodland habitat recorded along the northern boundary of the survey area, adjacent to residential	Y	Y	Due to the habitat being an example of a Habitat of Principal Importance (HPI), this habitat was considered to be of local conservation value.

Habitat Type	Description	Present within redline boundary	Present within 100 m of red line boundary	Nature Conservation Evaluation
	housing. Mature trees including: sycamore (*Acer pseudoplatanus*), ash (*Fraxinus excelsior*), rose (*Rosa* sp.). Understorey species recorded were dominated by ivy (*Hedera helix*), moss sp., lesser celandine (*Ficaria verna*), *Carex* sp., purple moor grass (*Molinia caerula*), selfheal (*Prunella vulgaris*), greater willowherb (*Epilobium hirsutum*), *Rumex* sp., bramble (*Rubus fruticosus* agg.), hart's tongue fern (*Asplenium scolopendrium*), broad buckler fern (*Dryopteris dilatata*), lords and ladies (*Arum maculatum*) and *Montbretia,* which is listed under Schedule 9 of the W&CA 1981 as an invasive non-native species.			
	Woodland habitat 2: Broad-leaved woodland located outside the redline boundary to the south west of the survey area and directly west of an area of scattered scrub. Woodland habitat consisted of ash, oak (*Quercus robur*) and elder (*Sambucus nigra*). Understorey species recorded were bramble, ivy, cocksfoot (*Dactylis glomerata*), rosebay willowherb (*Chamerion angustifolium*), daffodil (*Narcissus pseudonarcissus*) and hogweed (*Heracleum sphondylium*). Canopy sparse, with swamp/pond at western end of land parcel.		Y	
A2.1 Dense scrub	Scrub habitat 1: Dense scrub dominated by buddleia and ash with elder, hawthorn (*Crataegus monogyna*), rose, and honeysuckle (*Lonicera periclymenum*). Present throughout the survey area. Understorey consisted of bramble, ivy, rosebay willowherb, knapweed (*Centaurea* sp.), teasel (*Dypsacus fullonum*), purple moor grass, wild carrot (*Daucus carota*), jointed rush (*Juncus articulates*), soft rush (*J. effusus*), St. John's wort (*Hypericum perforatum*), *Carex* sp., primrose (*Primula vulgaris*),	Y	Y	This habitat type was common within the survey area and is considered to be of negligible conservation value.

Habitat Type	Description	Present within redline boundary	Present within 100 m of red line boundary	Nature Conservation Evaluation
	Leycesteria formosa and hart's tongue fern.			
	Scrub habitat 2: Dense scrub of blackthorn (*Prunus spinosa*) with bramble understorey located outside the redline boundary to the east of the disused railway track and an area of scattered scrub.		Y	
	Scrub habitat 3: Dense bramble scrub located outside the redline boundary in the south east of the survey area.		Y	
A2.2 Scattered scrub	Scattered scrub located outside the redline boundary to the east of the disused railway track and within the redline boundary forming the south east boundary of horse paddocks. Scrub habitat dominated by young oak trees with bramble. Understorey recorded as cocksfoot, wild carrot and greater burdock (*Arctium lappa*).	Y	Y	This habitat type was common within the survey area and is considered to be of negligible conservation value.
B1.2 Semi-improved acid grassland	Small area of semi-improved acid grassland along disused railway track, now grassed over. This part of the track has no evidence of use by motorised vehicles; only use by users of the livery yard and horses and is situated directly atop the railways bridge at the south east of the redline boundary (refer to TN 24). Species including cocksfoot, Yorkshire fog (*Holcus lanatus*), bramble, soft rush, ribwort plantain (*Plantago lanceolata*), *Trifolium* sp., moss sp., creeping buttercup (*Ranunculus repens*), buddleia, yarrow (*Achillea millefolium*), tormentil (*Potentilla erecta*), common mouse-ear (*Cerastium fontanum*) and common valerian (*Valeriana officinalis*).		Y	Due to its scarcity within the survey area, this habitat was considered to be of value within the context of the survey area.
B4 Improved grassland	Improved grassland dominated the majority of the habitat within the redline boundary. This habitat type was grazed very short with poaching by horses. Perennial ryegrass (*Lolium*	Y	Y	This habitat type was common within the survey area and is considered to be of negligible conservation value.

Habitat Type	Description	Present within redline boundary	Present within 100 m of red line boundary	Nature Conservation Evaluation
	perenne) dominant with *Trifolium* sp., daisy (*Bellis perennis*), nettle (*Urtica dioica*), soft rush, selfheal and field forget-me-not (*Myosotis arvensis*). Evidence of some finer-leaved grasses throughout sward.			
B5 Marshy grassland	Marshy grassland 1: Long field parcel to the south east of the red line boundary. This field is part of the Ty-r-Orsaf SINC for grassland habitat mosaic interest. Contained tussocky grassland with mosaics of E2.2 throughout and bordered by scattered and dense scrub habitats. Dominated by purple moor grass and ragwort (*Senecio jacobaea*) dominant at the southern end. Other species recorded were knapweed, crested dog's tail (*Cynosurus cristatus*), sweet vernal grass (*Anthoxanthum odoratum*), soft rush, creeping bent (*Agrostis stolonifera*), *Juncus* sp., creeping buttercup, primroses, orchid (*Dactylorhiza* sp.) tussocks of tufted hair grass (*Deschampsia cespitosa*) and some stands of rose and bramble. Parts of field were churned up by horse activity and it is here where basic flush areas are evident.		Y	Due to its scarcity within the survey area, designation as a SINC and the habitat being an example of an HPI, this habitat was considered to be of district conservation value.
	Marshy grassland 2: Section of steep ground leading south west of the disused railway track with high proportions of bare ground leading directly into broad-leaved woodland, forming a short woodland ride. Forms part of Ty-r-Orsaf SINC. Area likely used as part of route for horse exercising, hence bare ground. Classified as marshy grassland due to abundance of bryophytes and presence of common valerian. Other species recorded were ivy, Yorkshire fog, greater willowherb, creeping buttercup and nettle.		Y	
B6 Poor semi-improved grassland	Semi-improved grassland narrow strip along disused railway track north of the area of semi-improved acid grassland, now grassed over. This part of the track has no evidence of use by motorised vehicles; only use by users of the livery yard and horses. Dominated by cocksfoot with		Y	This habitat type is considered to be of negligible conservation value.

Habitat Type	Description	Present within redline boundary	Present within 100 m of red line boundary	Nature Conservation Evaluation
	creeping bent, Yorkshire fog, *Trifolium* sp., daisy, tormentil, common mouse-ear. Used as track for horse training and as such much of the grass is disturbed and muddy.			
C3 Tall ruderal vegetation	Tall ruderal vegetation dominated by nettle with bramble, buddleia, greater burdock, cocksfoot, thistle (*Cirsium* sp.) and soft rush. Habitat evident throughout survey area.	Y	Y	This habitat type was relatively common within the survey area and is considered to be of negligible conservation value.
E2.2 Basic flush	Muddy wet habitat determined to be a basic flush due to a lack of dominant grasses. Located between disused railway and adjacent to marshy grassland with additional examples recorded at intervals throughout the marshy grassland habitat nearby. Significant poaching by horses / livestock. Species composition dominated by bryophytes and sedges predominantly carnation sedge (*Carex panacea*) with ribwort plantain, several moss sp., *Trifolium* sp., sow thistle (*Sonchus* sp.), purple moor grass, selfheal , yarrow, daisy.		Y	Due to its scarcity within the survey area this habitat was considered to be of local conservation value.
F1 Swamp	Pond 3: Bulrush (*Typha latifolia*) abundant with approximated 50% woodland canopy cover in summer. This part of the survey area could not be accessed and therefore this pond has not been mapped; assessment was made from adjacent field and habitat was determined due to height and characteristics of bulrush.		Y	Due to the habitat being a small example of an HPI, this habitat was considered to be of local conservation value.
	Linear drainage ditch near entrance to livery yard between two areas of improved grassland. Ditch consisted of low water level containing swamp species: common reed (*Phragmites australis*), bulrush, nettle, bramble, rosebay willowherb, cow parsley, broad-leaved dock (*Rumex obtusifolius*), soft rush, water forgetmenot (*Myosotis scorpioides*), bramble, greater willowherb.	Y		

Habitat Type	Description	Present within redline boundary	Present within 100 m of red line boundary	Nature Conservation Evaluation
F2.1 Marginal vegetation	Drainage ditch, dried out although still wet, located along field boundaries within the survey area. Dominated by perennial ryegrass, with greater burdock, *Rumex* sp., nettle, hogweed, rosebay willowherb, creeping buttercup.	Y		This habitat type was relatively common within the survey area and is considered to be of negligible conservation value.
G1 Standing water	Pond 1: Standing water within woodland to the south west of the survey area. Highly vegetated with approximately 75% of shade canopy in summer. Emergent plant species evident were hemlock water dropwort (*Oenanthe crocata*) and a pondweed. Ivy and bramble encroach at edges.		Y	This habitat is a small example of an HPI however it is common within the survey area and therefore this habitat was considered to be of local conservation value.
	Pond 2: Ephemeral in-field ponds outside of the redline boundary likely caused by season rainfall. No canopy cover. Some emergent vegetation recorded including floating sweetgrass (*Glyceria fluitans*), *Rumex* sp. and broad-leaved pondweed (*Potamogeton natans*). Pair of foraging mallard (*Anas platyrhynchos*).		Y	
J1.1 Arable	Arable fields left to stubble overwinter, outside the redline boundary. Likely conventional non-organic due to presence of tram-lines, possibly spring sown crop. No evidence of arable weeds amongst stubbles and no field margins evident: cropping adjacent to hedgerow.		Y	This habitat type was relatively common within the survey area and is considered to be of negligible conservation value.
J2.1 Continuous species-poor hedge	Continuous hedgerows evident throughout the survey area and within the redline boundary. Woody species dominated by hawthorn, with sycamore, hazel (*Corylus avellana*), ash, *Clematis* and blackthorn. Understorey species recorded were ivy, bramble, nettle, lords and ladies, greater burdock, *Rumex* sp., hairy bittercress (*Cardamine hirsute*), cocksfoot, cow parsley (*Anthriscus sylvestris*) and lesser celandine.	Y	Y	Hedgerows are classed as HPI however it is common within the survey area and therefore this habitat was considered to be of local value.
J2.2 Defunct species-poor hedge	Defunct species-poor hedge of approximately 2 m in height with patchy hawthorn evident, outside the redline boundary. Hedge		Y	Hedgerows are classed as HPI however this example is not a continuous boundary

Habitat Type	Description	Present within redline boundary	Present within 100 m of red line boundary	Nature Conservation Evaluation
	boundary separates scattered and dense scrub habitats and an arable field in the east of the survey area.			and is species-poor and therefore this habitat was considered to be of negligible conservation value.
J2.4 Stone wall	Stone wall of old railway bridge with vegetation alongside including buddleia, dogwood (*Cornus sanguinea*), bramble, ivy. Refer to TN 24.	Y	Y	This habitat type is considered to be of negligible conservation value.
J4 Bare ground	Muddy tracks present throughout site where used for horse exercise.	Y	Y	This habitat type is considered to be of negligible conservation value.

4.3 TARGET NOTES

4.3.1 Target notes were made for notable features and/or areas that could not be mapped, or which required further description beyond the Phase 1 habitat categorisation. Table 4.3.1 below summarises the features of interest that have been target noted (TN) on the Phase 1 habitat map (Appendix A, Figure 4).

Table 4.3.1: Target notes for the Extended Phase 1 Assessment and their relative descriptions

Target Note Number	Description
TN 1	General storage area containing: plastic piping, trailers, a caravan, traffic signals and mixed rubble. Potential for reptiles
TN 2	Hawthorn covered by ivy. Potentially suitable for bats.
TN 3	Mammal tracks either side of railway bridge leading down the embankment. Potential for small mammals, or badgers.
TN 4	Deadwood pile. Potential for reptiles.
TN 5	Woodpile. Potential for reptiles.
TN 6	Dense scrubland, many trees with ivy cover. Potential for bats. Includes many small mammal, possibly badger, runs throughout.
TN 7	Mammal tracks, possibly badger.
TN 8	Mature hawthorn with ivy cover. Potential for bats.
TN 9	Plastic piping with bramble cover. Potential for reptile refugia.
TN 10	Potential mammal hole.
TN 11	Old railway bridge. Potential for bats.
TN 12	Rubble with ivy/bramble cover. Potential for reptiles.
TN 13	Potential reptile refugia.
TN 14	Mature tree with ivy cover. No holes visible. Potential for bats.
TN 15	Four mature trees with ivy cover. No holes visible. Potential for bats.
TN 16	Small mammal hole, with freshly dug spoil. Possible badger sign.

Target Note Number	Description
TN 17	Electrical cable tubing and vegetation. Potential for reptiles.
TN 18	Mature hawthorn tree with ivy cover. Potential for bats.
TN 19	Large, mature ash tree, no visible holes. Potential for bats.
TN 20	Storage area, with track over bridge leading to muck heaps. Potential for reptile refugia.
TN 21	Bridge with ivy cover. Potential for bats.
TN 22	Mature tree with ivy cover, no holes visible. Potential for bats.
TN 23	Mature tree, possibly sycamore, with holes and ivy cover. Potential for bats.
TN 24	Bridge. Potential for bats.
TN 25	Possible mammal tracks leading down embankment.
TN 26	Storage area for horse equipment containing wooden pallets. Potential for reptile refugia.
TN 27	Farm buildings with traditional open windows and corrugated metal roofing, has ivy cover. Potential for bats. Potential for barn owls.
TN 28	Mature oak tree with ivy cover, no holes visible. Potential for bats.

4.4 PROTECTED OR NOTABLE SPECIES

[redacted]

OTTER

4.4.4 The desk study returned one record of otter from 2010 at 0.17 km from the central grid reference of the survey area. This record was located at the south west boundary of the survey area at the junction of Fort Road and Lavernock Road. This individual was likely to have been commuting to Cosmeston Lakes Country Park to forage, potentially from the Severn Estuary.

4.4.5 The survey area comprised limited habitat considered suitable to support otters (*Lutra lutra*) with no suitable aquatic or terrestrial habitat for resting or breeding. No activity signs were noted during the Phase 1 habitat survey.

4.4.6 This species will not be considered further in this report.

WATER VOLE

4.4.7 The desk study returned no records of water voles (*Arvicola amphibius*) within 2 km of the survey area.

4.4.8 Waterbodies within the survey area were considered unsuitable to support water voles due to the absence of connected waterbodies within the survey area. Waterbodies were limited to small ponds. No activity signs were noted during the Phase 1 habitat survey.

4.4.9 This species will not be considered further in this report.

DORMOUSE

4.4.10 The desk study returned no records of dormice within 2 km of the survey area.

4.4.11 Suitable habitat for dormice was present throughout the survey area, particularly along embankments, woodland and dense scrub habitats with high levels of connectivity between areas of suitable habitat. Hedgerow and scrub habitats consisted of fruit-bearing trees which may provide dormice with nesting habitat, shelter and food sources.

4.4.12 This species will be considered further in this report.

BATS

4.4.13 The desk study returned more than 1600 records of bats within the 10 km search area. These records included 92 bat roosts from seven species comprising brown long-eared bat, common pipistrelle, Daubenton's bat, lesser horseshoe bat, Leisler's bat, noctule, serotine and soprano pipistrelle. Roosts were also recorded for unknown bat species and unknown pipistrelle species. The closest roost record was 1.089 km from the search area.

4.4.14 Non-roost records were comprised of more than 1500 records of ten species comprising brown long-eared bat, common pipistrelle, Daubenton's bat, lesser horseshoe bat, Leisler's bat, Nathusius's pipistrelle, noctule, serotine, soprano pipistrelle and whiskered bat. The closest record comprised several species from within the survey area.

4.4.15 Suitable roosting, breeding and foraging habitats for bats were present throughout the survey area. The survey area contained several buildings, trees and three railways bridges with potential for roosting sites. Suitable commuting / foraging routes for bats were present throughout the survey area including linear features of scrub, woodland and hedgerow adjacent to habitat mosaics which may provide a broad range of invertebrate prey.

4.4.16 Bat species will be considered further in this report.

BIRDS

4.4.17 The desk study returned records of more than 140 bird species within 2 km of the survey area consisting of 44 Schedule 1 species, 53 Section 42 species, 34 red-listed species (UKBoCC) and 51 amber-listed species (UKBoCC).

4.4.18 The majority of records of bird species were associated with Cosmeston Lakes Country Park, the Severn Estuary SPA and other designated sites. The abundance of species records is reflective of the location of the survey area within 2 km of these designated sites.

4.4.19 The survey area was highly suitable for breeding birds. Key habitat features include woodland and scrub, including trees with holes that may be useful for hole-dwelling species and continuous habitat corridors providing nesting habitat, winter shelter and year-round food sources.

4.4.20 There is anecdotal evidence of a barn owl foraging in a building within the survey area. There are no barn owl nest boxes present. Several of the buildings have the potential to be used by barn owls for nesting. All buildings present are well-used for horse stables, livery yard activity and other storage and are consequently frequently disturbed.

4.4.21 The Severn Estuary SPA is designated for wintering populations of gadwall, white-fronted goose, dunlin, Bewick's swan, shelduck and redshank. These are unlikely to breed within the survey area although may use it for winter foraging or roosting at high tide. There was limited suitability for ground-nesting species, although the semi-improved grassland to the south east and surrounding arable land may provide suitable habitat.

4.4.22 Bird species will be considered further in this report.

REPTILES

4.4.23 The desk study returned no records of reptiles within 2 km of the survey area.

4.4.24 The survey area contained habitat suitable for foraging, resting and breeding reptiles. Areas of rubble (TN 1, TN 12) may provide suitable habitat for hibernacula. Scrub habitats and steep embankments throughout the survey area were considered to be suitable for reptiles, as well as the mosaic of scrub, grassland and waterbodies.

4.4.25 These species will be considered further in this report.

AMPHIBIANS (GREAT CRESTED NEWTS) (GCN)

4.4.26 The desk study returned two records each of common frog and common toad, and three records of GCN within the search area.

4.4.27 All standing water bodies within the survey area have potential for presence of GCN, both within the boundary of the survey area and at nearby Cosmeston Lakes Country Park SSSI.

4.4.28 This species will be considered further in this report.

INVERTEBRATES

4.4.29 The desk study returned 70 records of protected or notable invertebrates within 2 km of the survey area. None of these were recorded within the search area. These included the following species:

- One record of bumblebee (*Thoracobombus humilis*); listed under Section 42 (NERC) and UK BAP;
- Two records of shrill carder bee which is listed under Section 42 (NERC), UK BAP and RD2 (UK).
- 13 records of butterflies consisting of 12 records of dingy skipper and one record of grayling both of which are listed under Section 42 (NERC), UK BAP and RD1 (UK);
- 12 records of protected and notable moths consisting of two records of Jersey tiger, four records of L-album Wainscot , four records of marsh grey and two records of scarlet tiger which are listed on RD2 (UK);

- 40 records of protected and notable dragonflies consisting of seven records of hairy dragonfly which are listed under RD2 (UK); and 33 records of scarce blue-tailed damselfly which are listed under RD1 and RD2 (UK); and
- One record of reed beetle which is listed under Section 42 (NERC) and UK BAP.

4.4.30 The survey area contained a mosaic of common and widespread habitats, which present some potential for common species of terrestrial and aquatic invertebrates, however it is not considered likely that notable or protected species are present within the survey area.

4.4.31 These species will not be considered further in this report.

FLORA

4.4.32 The desk study returned 25 records of protected or notable plant species within 2 km of the survey area. These included the following species:

- Four records of orchids consisting of: one record of autumn lady's-tresses (*Spiranthes spiralis*), one record of greater butterfly-orchid (*Platanthera chlorantha*), and one record of green-winged orchid (*Anacamptis morio*) which are listed on RD1 (UK); and one record of fragrant orchid (*Gymnadenia conopsea*) listed under Section 42 (NERC);
- Three records of ivy broomrape (*Orobanche hederae*) which is listed under RD2 (UK);
- One record of a liverwort: minute pouncewort (*Cololejeunea minutissima*) which is listed under RD2 (UK);
- Seven records of bryophytes consisting of four records of Nicholson's beard-moss (*Didymodon nicholsonii*) which is listed under RD2 (UK); one record of strap-leaved earth-moss (*Ephemerum recurvifolium*) which is listed under RD1 (Wales) and RD2 (UK); and two records of thatch-moss (*Leptodontium gemmascens*) which is listed under UK BAP , RD1 (UK) and RD2 (UK);
- One record of wild service tree (*Sorbus domestica*) which is listed under RD1 (UK) and RD2 (UK);
- Eight records of the aquatic starry stonewort (*Nitellopsis obtuse*) which is listed under Section 42 (NERC), UK BAP and RD1 (UK); and
- One record of fritillary (*Fritillaria meleagris)* listed under RD1 and RD2 (UK).

4.4.33 The desk study returned one record of a non-native invasive species within 0.5 km of the survey area:

- Three-cornered garlic (*Allium triquetrum)*.

4.4.34 The field study identified one stand of *Montbretia* (refer to Table 4.2.1). This plant is a garden escape and is listed on Schedule 9 of the W&CA 1981, and as such, it is an offense to cause this species to propagate in the wild. No other protected or notable species were observed during the field survey. None of the species returned by the desk study were recorded with the survey area. The area within the redline boundary consisted of predominantly common and widespread, species-poor habitats such as improved grassland. Within the 100 m survey area lying outside the redline boundary there were habitats of further interest such as marshy grassland, basic flushes and mosaic habitats which are designated as a SINC.

4.4.35 Flora will be considered further in this report in the context of important habitats and invasive species

5 DISCUSSION AND RECOMMENDATIONS

5.1 DISCUSSION AND RECOMMENDATIONS

5.1.1 At this stage the detailed design of any potential works is not available and as such, the recommendations for further surveys contain a degree of uncertainty by necessity. A table summarising the requirement for potential additional surveys / assessments is included in the Recommendations Summary Section below.

5.1.2 An initial assessment with regards to potential ecological impacts associated with any potential development is discussed below.

STATUTORY AND NON-STATUTORY DESIGNATED SITES

5.1.3 The report has identified four statutory designated sites within 2 km of the survey area comprising of:

- Severn Estuary Ramsar / SPA / SAC / SSSI within 0.5 km of the survey area;
- Cosmeston Lakes SSSI adjacent to the survey area;
- Penarth Coast SSSI less than 0.5 km from the survey area; and
- Cog Moors SSSI within 2 km of the survey area.

5.1.4 The report has also identified eight non-statutory designated sites within 2 km comprising of:

- Ty-r-Orsaf SINC;
- Cosmeston Lakes Country Park SINC;
- Pop Hill SINC;
- Downs Wood SINC and AWI;
- Cogan Pond SINC;
- Lavernock Point East;
- Lavernock Point Wildlife Trust Nature Reserve; and
- Cog Moors SINC.

5.1.5 Once the full scope of any potential works is identified it is advised that any identified potential effects of the development on these aforementioned sites is evaluated and appropriate measures are taken to avoid negative impacts.

5.1.6 A HRSA will likely be required due to the proximity of the potential development to a European statutory designated site (Severn Estuary Ramsar / SPA / SAC). This would be to identify any likely significant effects of any development upon this European designated site, either alone or in combination with other plans and projects in the local area.

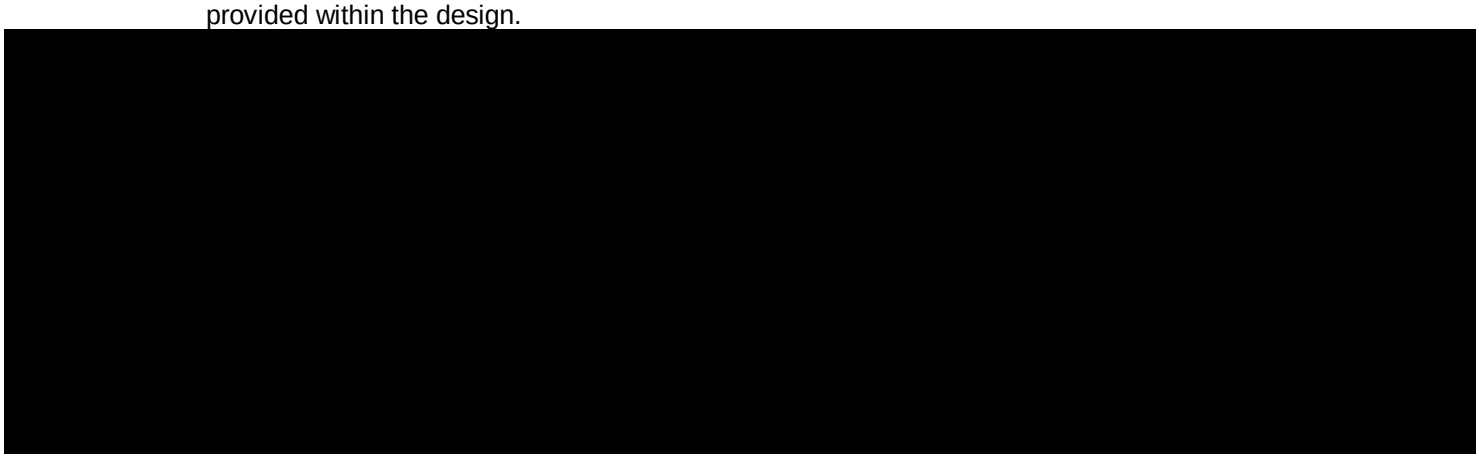
S42 / UK AND LOCAL BAP HABITATS

5.1.7 The majority of habitats present are considered to be of negligible importance or only of importance within the context of the survey area due to the high levels of recreational disturbance.

5.1.8 There are four habitats within the survey area that are priority habitats within the S42 / LBAP:

- Ponds;
- Lowland mixed deciduous woodland;
- Lowland meadows (as per designated Ty-r-Orsaf SINC); and
- Hedgerows.

5.1.9 Whilst there is no specific legal protection of these habitats, there is a presumption against development that would result in a loss of Habitats of Principal Importance. In order to comply with planning policy, development proposals would need to demonstrate that there would be no significant loss of this habitat as a result of the design. Therefore, if any waterbodies, woodland or lowland grassland are to be lost, replacement habitat commensurate with that loss should be provided within the design.



DORMICE

5.1.13 The presence of suitable habitat for dormice throughout the survey area suggests dormice may be present within the survey area. Further detailed dormouse surveys are recommended in areas of suitable habitat within the survey area to determine presence or likely absence.

5.1.14 Detailed surveys using nest tubes would need to be conducted within areas of suitable woodland and scrub. Nest tubes would need to be deployed during April/May followed by subsequent checks during May to October/November.

5.1.15 Should dormice be present and habitat clearance cannot be avoided, then a European Protected Species (EPS) mitigation licence may be required in order to undertake the works lawfully.

BATS

5.1.16 The Extended Phase 1 survey identified suitable habitat for foraging, commuting and roosting bats within the survey area. Bat activity surveys are recommended throughout the survey area to establish if any flight corridors / commuting routes would be affected, together with an assessment of species composition and general distribution. This would likely include bat activity transects and static detector surveys through April/May to October as per best practice guidance[8].

5.1.17 Several trees, structures and buildings were identified within the survey area as having potential to support bat roosts. Impacts therefore on semi-mature and mature trees should be avoided. Any trees and buildings that may be affected will require further input with respect to bats. This would involve a PBRA from the ground of potentially affected trees and buildings; those with the potential to support roosting bats would require further detailed surveys. This could include aerial assessments for bats and / or dusk and dawn emergence / re-entry surveys. Should a bat roost be identified and impacts cannot be avoided then a European Protected Species (EPS) mitigation licence may be required in order to undertake the required works.

5.1.18 There will need to be consideration of potential impacts on bats from lighting requirements both during the construction phase and once construction is complete.

[8] Collins, J (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd edition, Bat Conservation Trust, London.

BIRDS

5.1.19 The survey area contained habitats with the potential to support breeding bird species across a variety of habitats. Breeding bird surveys would involve, as a minimum, monthly transect surveys between March/April and June to ascertain breeding bird assemblages and would identify important habitat types that may need consideration.

5.1.20 Habitats known to be used by breeding birds that will require consideration include (but are not limited to): hedgerows and scrub; woodland; and grassland habitats.

5.1.21 During the construction phase it is recommended that any required vegetation clearance takes place outside of the breeding bird season (considered to be March to September) to avoid destruction of any active nests and with particular consideration for any Schedule 1 species breeding on-site which are legally protected from breeding disturbance. Where it is not possible to clear vegetation outside of the breeding bird season, vegetation suitable to support nesting birds that will be affected by works should be checked by an ecologist no more than 48 hours prior to commencement of works. Any nesting birds identified must be left to fledge before works may commence. Should nesting birds be identified, safe working distances should be determined by an ecologist.

5.1.22 The survey area was not determined to have suitable habitats for significant numbers of protected wintering birds, however due to close proximity to the Severn Estuary SPA it is recommended that once proposals are confirmed, the need for winter bird surveys is revised. This would be to determine any potential disturbance impacts on the SPA by future activities such as recreational disturbance and would require vantage point counts during the winter months (November to March) to record activity of designated species with regard to the nature of any development.

BARN OWLS

5.1.23 Assessment of suitability for nesting barn owls would be identified during internal bat roost inspections of buildings and trees (PBRA; see section 5.1.16). Any evidence of nesting would necessitate a barn owl survey by a licensed ornithologist.

REPTILES

5.1.24 The survey area was considered suitable to support the more common reptile species. It is recommended that a targeted survey is undertaken.

5.1.25 Targeted reptile surveys would involve presence / absence surveys carried out as per standard methodologies as recommended in the Herpetofauna Workers' Manual and Froglife Advice Sheet 10. Artificial refugia would be distributed across areas of suitable habitat, numbered and marked on a map.

5.1.26 Locations would be chosen to try to avoid areas of high levels of disturbance by members of the public, dogs and livestock. These refugia would be checked on seven visits throughout the active season (April to September) to record reptile species present.

5.1.27 Should reptile species be present, methods would be required during construction to avoid injury or killing. This could involve translocating reptiles out of the area prior to works, or careful vegetation clearance. Compensation could involve the enhancement of retained habitats.

GREAT CRESTED NEWTS

5.1.28 It is recommended that GCN presence / absence surveys are undertaken to ascertain the presence or likely absence of GCN within the survey area. If GCN are found to be present, population surveys would be required.

5.1.29 Survey work for GCN can be carried out between mid-March to mid-June, with at least two of these visits during mid-April to mid-May and may include a range of survey techniques. Should this survey window be missed it should be noted that it be possible for eDNA surveys of the waterbodies on site to be conducted in an attempt to establish GCN presence to inform potential constraints.

5.1.30 If the presence of GCN is confirmed further GCN surveys (population size class assessment surveys comprising 6 visits) would be required. This information would be used to inform the need for and details of an EPS mitigation licence application, including sufficient mitigation measures, in order to carry out the developmental proposals legally.

INVERTEBRATES

5.1.31 The Ty-r-Orsaf SINC, adjacent to the redline boundary, contains floristically diverse habitats with the potential to support a wide range of terrestrial invertebrate species, and the desk study returned results of species which although not recorded within the survey area, have potential to be found within the designated habitats. Should any potential development been deemed to have a potential indirect impacts on the integrity of these habitats then a targeted invertebrate survey of these habitats will be required.

5.1.32 After this assessment has been carried out should invertebrate surveys be required, these should be designed in consultation with the Local Authority Ecologist. Terrestrial invertebrate surveys would be carried out during the summer months.

5.1.33 It is recommended that landscape plans include retention and enhancement of the mosaic of habitats outside of the redline boundary and creation of suitable habitats for a range of aquatic and terrestrial invertebrates.

FLORA

5.1.34 The adjacent Ty-r-Orsaf SINC contained habitats designated for grassland and mosaic habitats. The desk study returned results of botanical species which although not recorded within the survey area, have potential to be found within the designated site, such as orchids and bryophytes.

5.1.35 Should any development be deemed to have potential indirect impacts on the integrity of these habitats, targeted NVC Phase 2 Habitat Surveys may be required. Targeted surveys would be conducted at optimal times of year according to habitat types with woodland surveys conducted in May; and grassland habitats conducted in the summer months).

5.1.36 One species listed on Schedule 9 of the W&CA 1981 (*Montbretia*) was identified during the field survey. Appropriate measures should be taken to ensure this species is not spread by any potential development.

5.2 RECOMMENDATIONS SUMMARY

5.2.1 From the Extended Phase 1 Habitat Assessment, it is recommended that the following Phase 2 ecological survey types are undertaken to inform potential impacts and suitable mitigation and compensation measures in light of any potential development:

- [redacted]
- Dormouse nest tube surveys throughout suitable scrub and woodland habitats;
- Bats: Preliminary Bat Roost Assessment (PBRA) of buildings and trees; activity transect surveys; and static monitoring surveys;
- Breeding bird surveys and pre-works checks for breeding birds prior to any vegetation clearance undertaken between March and September, inclusive;
- Barn owl: an assessment to be made of suitability of buildings within the survey area for nesting barn owls simultaneously with PBRA for roosting bats;
- Reptile surveys throughout areas of scrub, rubble and potential basking sites; and
- Great crested newt surveys of up to four ponds within the survey area and ponds in close proximity at Cosmeston Lakes Country Park within 500 m of the red line boundary. Great crested newt eDNA surveys of smaller ponds within 500 m of the survey area **if Phase 2 surveys commence after mid-May** to determine potential presence and requirements for full population assessment.

5.2.2 It is recommended that the following be considered in addition to the above depending upon the nature of any potential development.

- It is highly likely that a Habitat Regulations Screening Assessment will be required to assess the potential for likely significant effects to the Severn Estuary SPA/SAC/Ramsar. It is recommended that this is undertaken if development proposals are progressed;
- Wintering birds are a key feature of the Severn Estuary SPA which may be affected by urbanisation and recreational activity which are cited as “threats” (negative impacts with high effect);
- Phase 2 National Vegetation Classification (NVC) Habitat Survey of surrounding habitats of interest such as woodland, marshy grassland and basic flush mosaic habitats, in particular Ty-r-Orsaf Site of Importance for Nature Conservation (SINC). These were found within 100 m of the survey area and should any potential development be deemed to have a potential indirect impact on the integrity of these habitats then a detailed habitat survey will be required;
- Invertebrate surveys of habitats of interest such as woodland and marshy grassland mosaic habitats, in particular the Ty-r-Orsaf SINC. These habitats found within 100 m of the survey area are floristically diverse and have potential to support a wide range of terrestrial invertebrate species. Should any potential development be deemed to have a potential indirect impact on the integrity of these habitats then a targeted invertebrate survey of these habitats will be required; and
- Creation of a Method Statement regarding *Montbretia* in the event any potential development is likely to affect this species.

Appendix A

FIGURES

Appendix A-1

FIGURE 1: MAP OF THE SURVEY AREA

Rev	Date	Description	By	Chk	App

WSP | PARSONS BRINCKERHOFF
Kings Orchard,
1 Queen Street, Bristol
BS2 0HQ
Tel: 44-(0)117-930-6200

Client:
WELSH ASSEMBLY GOVERNMENT

Site/Project:
COSMESTON FARM

Title:
THE SURVEY AREA

Drawn: JSdS		Checked: FH	
Designed: FH		Approved: KF	
Date: 15/04/2016	Scale: 1:10,000	A3	Sheet:

Project Number:	Drawing Number:	Revision:
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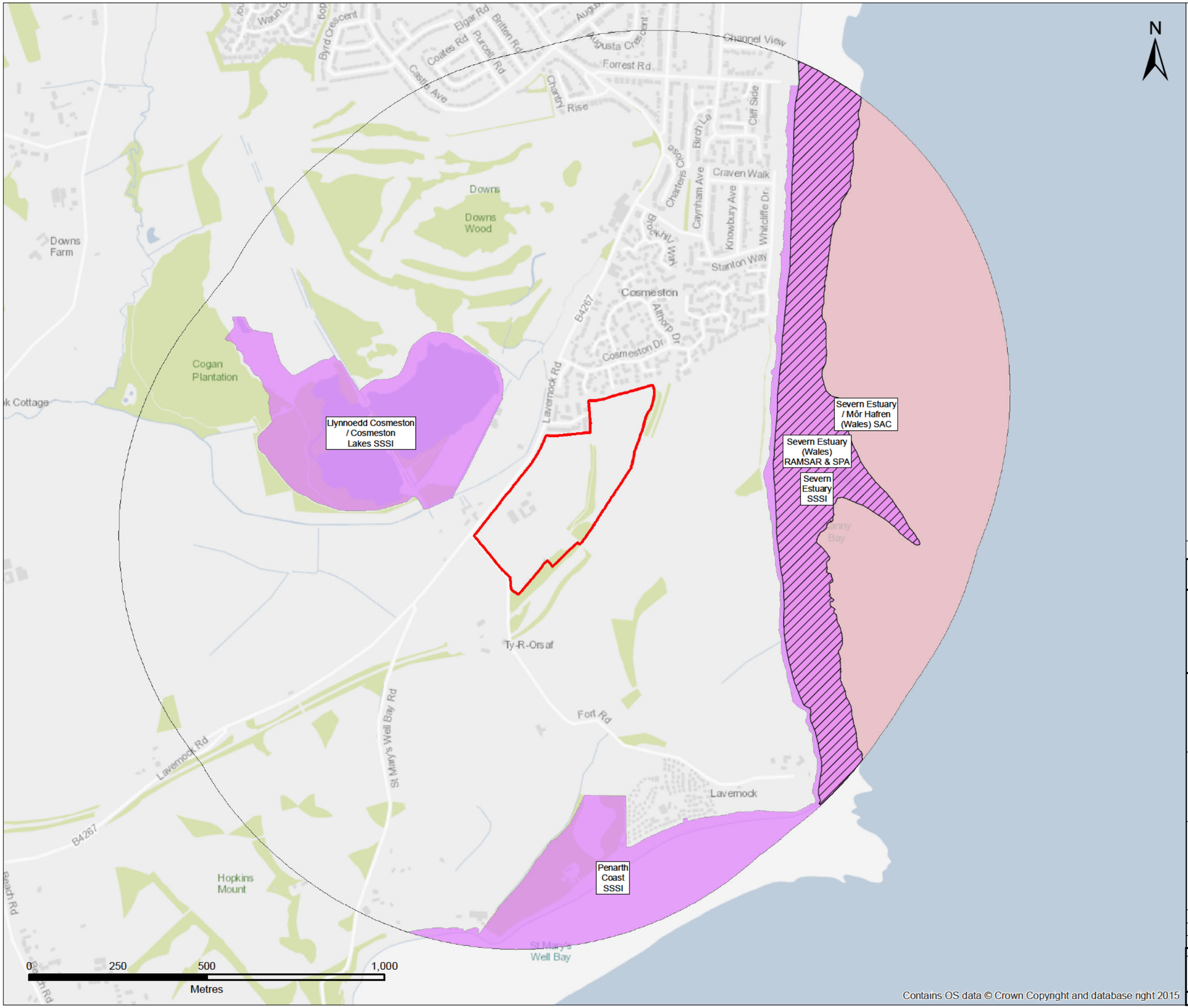
Login: DeSouzaJ
Plot Date: 15/04/2016

Appendix A-2

FIGURE 2: STATUTORY DESIGNATED SITES WITHIN 1 KM



The Survey Area
1km Study Area
Site of Special Scientific Interest (SSSI)
Special Area of Conservation (SAC)
RAMSAR and Special Protection Area (SPA)

Rev	Date	Description	By	Chk	App

WSP | PARSONS BRINCKERHOFF
Kings Orchard,
1 Queen Street, Bristol
BS2 0HQ
Tel: 44-(0)117-930-6200

Client:
WELSH ASSEMBLY GOVERNMENT

Site/Project:
COSMESTON FARM

Title:
STATUTORY DESIGNATED SITES WITHIN 1km OF THE SURVEY AREA

Drawn: JSdS		Checked: FH	
Designed: FH		Approved: KF	
Date: 15/04/2016	Scale: 1:10,000	A3	Sheet:

Project Number:	Drawing Number:	Revision:
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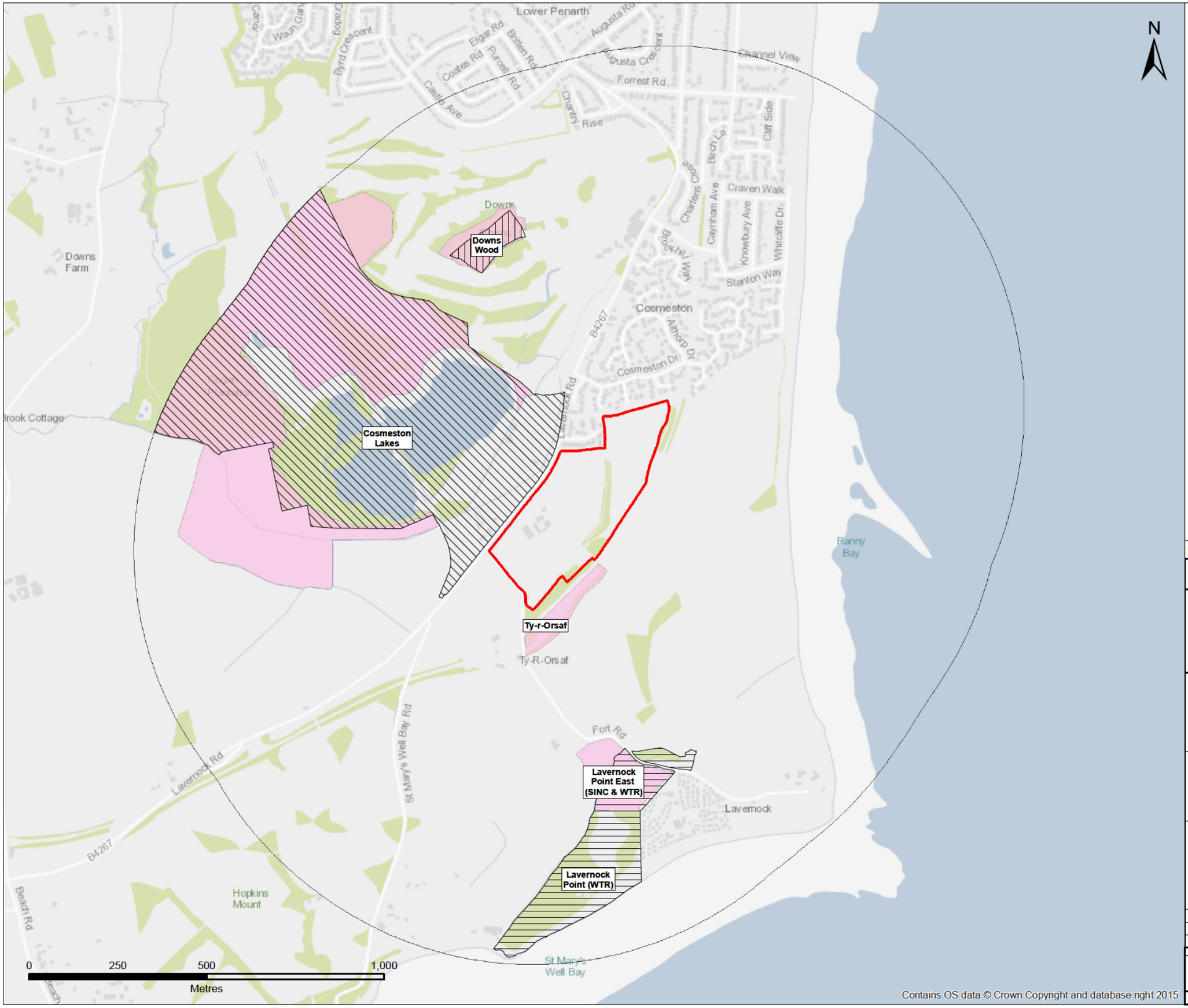
Login: DeSouzaJ
Plot Date: 15/04/2016

Appendix A-3

FIGURE 3: NON-STATUTORY DESIGNATED SITES WITHIN 1 KM



The Survey Area
1km Study Area
Site of Nature Conservation Interest (SINC)
Wildlife Trust Reserve (WTR)
Country Park
Ancient semi-natural woodland

Rev	Date	Description	By	Chk	App

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Site/Project:
COSMESTON FARM

Title:
NON-STATUTORY DESIGNATED SITES WITHIN 1km OF THE SURVEY AREA

Drawn: JSdS		Checked: FH	
Designed: FH		Approved: KF	
Date: 15/04/2016	Scale: 1:10,000	A3	Sheet:
Project Number:		Drawing Number:	Revision:
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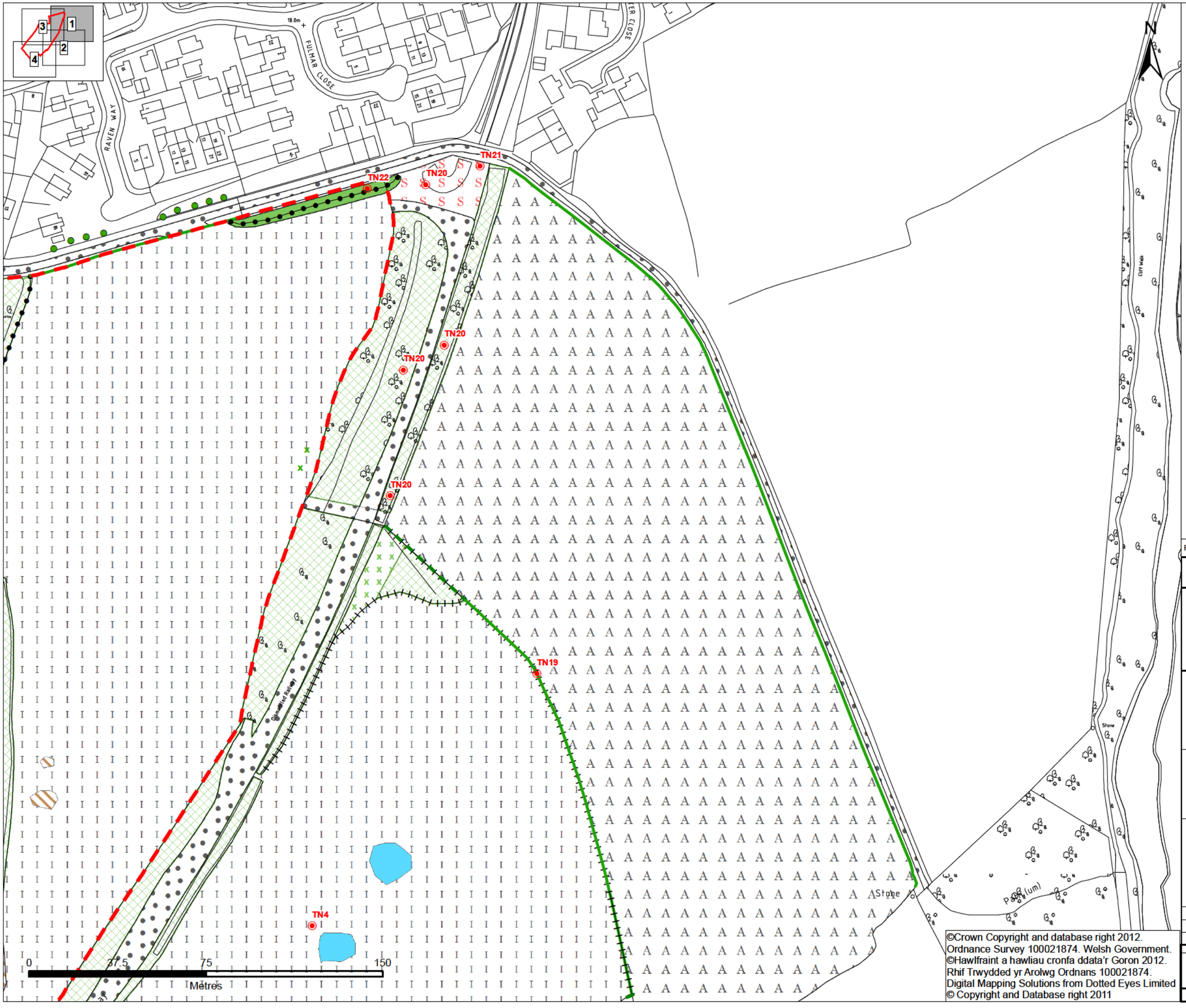
Appendix A-4

FIGURE 4: PHASE 1 HABITAT MAP



- The Survey Area
- Broad-leaved woodland
- Dense scrub
- Scatttered scrub
- Semi-improved acid grassland
- Marshy grassland
- Improved grassland
- Species-poor grassland
- Tall ruderal
- Basic flush
- Swamp
- Standing water
- Running water
- Spoil
- Arable
- Amenity grassland
- Buildings
- Bare ground
- Other habitat
- Not accessible
- Species-poor intact hedge
- Species-poor defunct hedge
- Marginal vegetation
- Fence
- Wall
- Earth bank
- Scattered tree
- Scattered scrub
- Target note

Rev	Date	Description	By	Chk	App

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BS2 0HQ
Tel: 44-(0)117-930-6200

Client:
WELSH ASSEMBLY GOVERNMENT

Site/Project:
COSMESTON FARM

Title:
PHASE 1
HABITAT SURVEY
PAGE 1 OF 4

Drawn: JSdS		Checked: FH	
Designed: FH		Approved: KF	
Date: 15/04/2016	Scale: 1:1,500	A3	Sheet:
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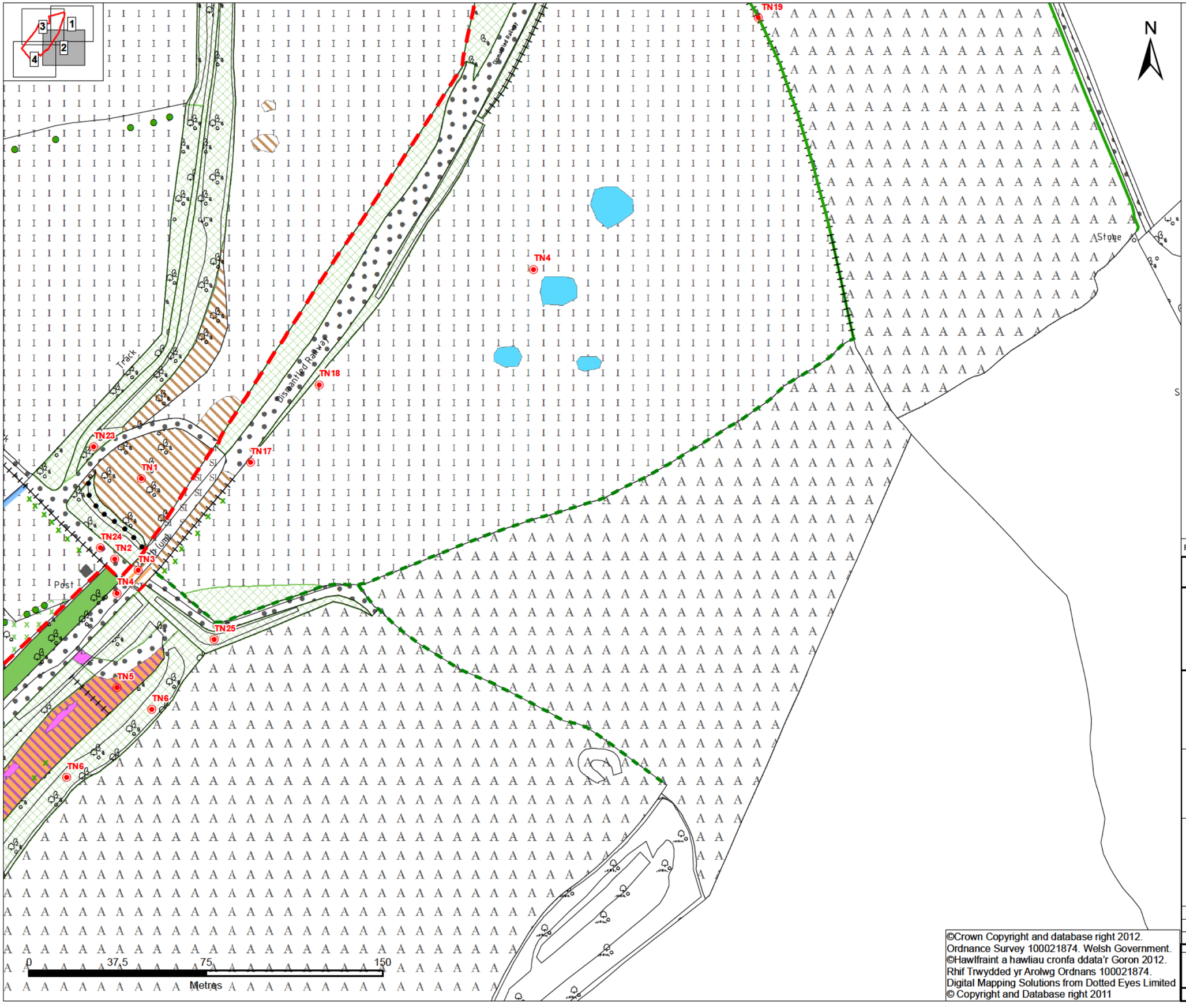

The Survey Area
Broad-leaved woodland
Dense scrub
Scatttered scrub
Semi-improved acid grassland
Marshy grassland
Improved grassland
Species-poor grassland
Tall ruderal
Basic flush
Swamp
Standing water
Running water
Spoil
Arable
Amenity grassland
Buildings
Bare ground
Other habitat
Not accessible
Species-poor intact hedge
Species-poor defunct hedge
Marginal vegetation
Fence
Wall
Earth bank
Scattered tree
Scattered scrub
Target note

Rev	Date	Description	By	Chk	App

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Site/Project:
COSMESTON FARM

Title:
PHASE 1
HABITAT SURVEY
PAGE 2 OF 4

Drawn:	JSdS	Checked:	FH
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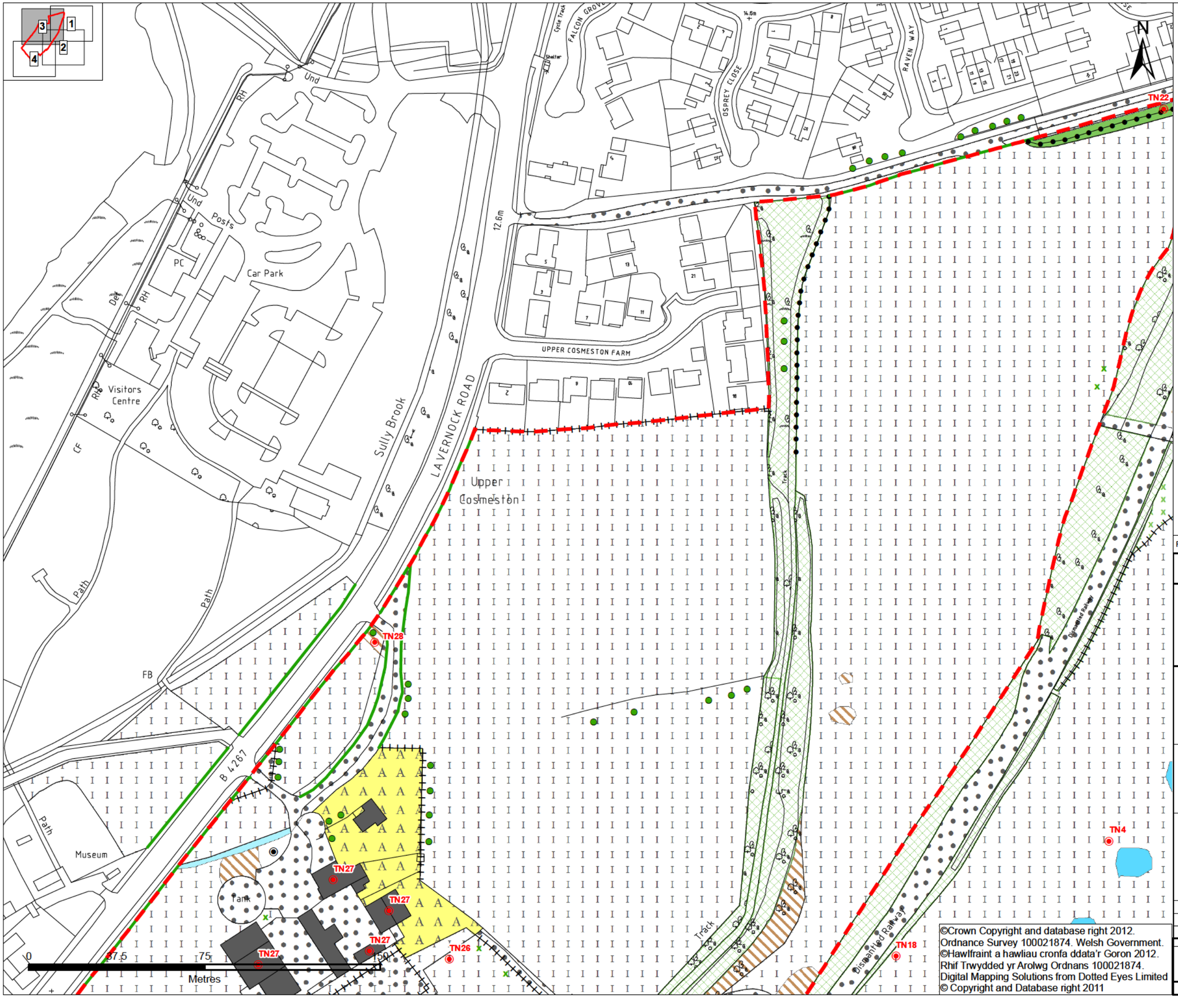

Rev	Date	Description	By	Chk	App

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Site/Project:
COSMESTON FARM

Title:
PHASE 1
HABITAT SURVEY
PAGE 3 OF 4

Drawn: JSdS		Checked: FH	
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Date: 15/04/2016	Scale: 1:1,500	A3	Sheet:
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62103859	FIGURE 4		

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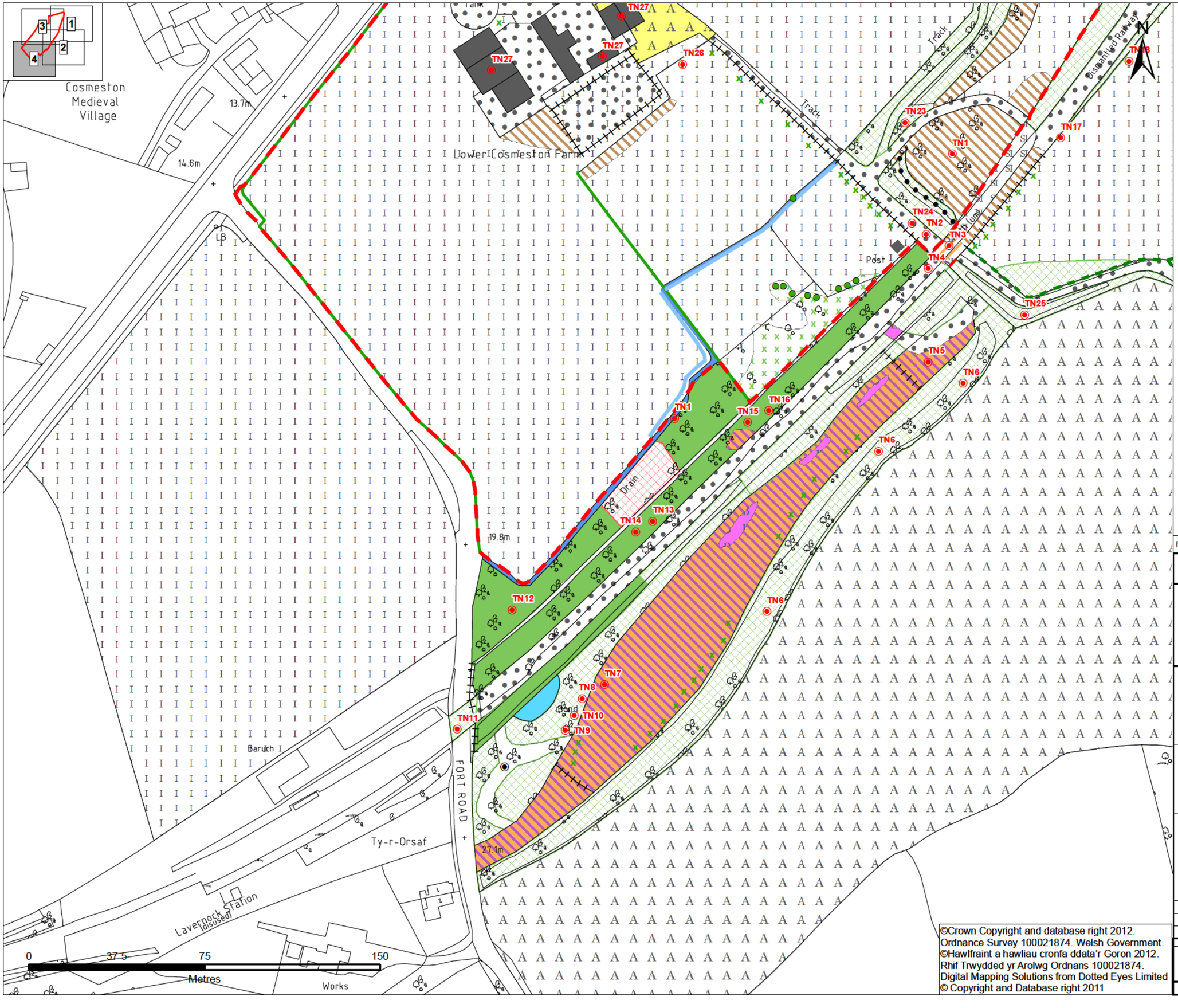

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Client:
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Site/Project:
COSMESTON FARM

Title:
PHASE 1
HABITAT SURVEY
PAGE 4 OF 4

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Plot Date: 15/04/2016

Appendix A-5

TABLE A-5.1: SUMMARY OF PROTECTED AND NOTABLE BIRD SPECIES

Table A-3.1: Summary of protected and notable bird species recorded within 2 km of the survey area

GR D REFERENCE (NEAREST RECORD)	COMMON NAME	SCIENTIFIC NAME	DATE (NEWEST RECORDS)	NO. OF RECORDS	CLOSEST DISTANCE (KM)	LEGAL STATUS[9]
ST1868	Arctic skua	*Stercorarius parasiticus*	2015	14	0.552	UKBAP, LBAP (CON), WBAm(RSPB), UKBR(RSPB)
ST177675	Arctic tern	*Sterna paradisaea*	2013	2	1.256	BDir1, WBR(RSPB), LBAP UKBAm(RSPB)
ST173688	Barn owl	*Tyto alba*	2012	2	0.552	WCA1.1, LBAP WBAm(RSPB) UKBAm(RSPB)
ST167674	Barn swallow	*Hirundo rustica*	2015	227	0.294	LBAP WBAm(RSPB), UKBAm(RSPB)
ST1769	Barnacle goose	*Branta leucopsis*	2013	3	0.582	BDir1, WBAm(RSPB), UKBAm(RSPB)
ST1866+	Bar-tailed godwit	*Limosa lapponica*	2007	1	2.338	WCA1.1, UKBAP, , LBAP WBAm(RSPB), UKBR(RSPB)
ST175695	Bearded tit	*Panurus biarmicus*	2014	46	0.202	WCA1.1 LBAP WBAm(RSPB), UKBAm(RSPB)
ST1967	Black tern	*Chlidonias niger*	2015	1	1.962	BDir1, WCA1.1, WBAm(RSPB), UKBAm(RSPB)
ST173691	Black-headed gull	*Chroicocephalus ridibundus*	2015	73	0.302	NERC, WBR(RSPB), LBAP UKBAm(RSPB)
ST1869	Black-legged kittiwake	*Rissa tridactyla*	2015	24	0.302	RD2 (UK), LBAP UKBAm(RSPB)
ST1769	Black-necked grebe	*Podiceps nigricollis*	2012	1	0.582	WCA1.1 WBAm(RSPB), UKBAm(RSPB)
ST1769	Black-tailed godwit	*Limosa limosa*	2009	1	0.582	WCA1.1, UKBAP, RD1 (UK), LBAP WBAm(RSPB), UKBR(RSPB)
ST17426906	Black-throated diver	*Gavia arctica*	2014	9	0.507	BDir1, UKBAP, WBAm(RSPB), UKBAm(RSPB)
ST1769	Brambling	*Fringilla montifringilla*	2015	25	0.552	WCA1.1, LBAP
ST1869	Brent goose	*Branta bernicla*	2011	2	0.302	BDir22, Bonn, LBAP, WBAm(RSPB), UKBAm(RSPB)
ST172691	Cetti's warbler	*Cettia cetti*	2015	46	0.202	WCA1.1, LBAP (ANG, PEM, VOG)
ST169695	Coal tit	*Periparus ater*	2015	35	0.282	Bern, LBAP (CON, POW), WBAm(RSPB)
ST175691	Common bullfinch	*Pyrrhula pyrrhula*	2015	91	0.181	NERC, UKBAP, WBR(RSPB), LBAP UKBR(RSPB), UKBAm(RSPB)
ST1769	Common crane	*Grus grus*	2015	2	0.582	BDir1, W&CA, UKBAm(RSPB)
ST181685	Common crossbill	*Loxia curvirostra*	2015	16	0.282	WCA1.1, LBAP
ST1769	Common cuckoo	*Cuculus canorus*	2015	5	0.552	NERC, UKBAP, WBR(RSPB), LBAP, UKBR(RSPB), UKBAm(RSPB)
ST1868	Common eider	*Somateria mollissima*	2008	5	0.302	LBAP WBAm(RSPB), UKBAm(RSPB)
ST173691	Common grasshopper warbler	*Locustella naevia*	2015	8	0.552	NERC, UKBAP, WBR(RSPB), LBAP UKBR(RSPB)

[9] UKBAP = UK biodiversity Action Plan, LBAP = Local Biodiversity Action Plan, BDir1 = EC Birds Directive Annex 1 Species, NERC = Natural Environment and Rural Communities Section 42 birds, UKBAm (RSPB) = RSPB UK Amber listed birds (not based on IUCN criteria), UKBR (RSPB) = RSPB UK Red listed birds (not based on IUCN criteria), WBAm (RSPB) = RSPB Welsh Amber listed birds (not based on IUCN criteria), WBR (RSPB) = RSPB Welsh Red listed birds (not based on IUCN criteria), and WCA1.1 = Wildlife and Countryside Act Schedule 1 Part 1 Species.

ST1868	Common greenshank	*Tringa nebularia*	2015	2	0.552	WCA1.1, LBAP
ST1967	Common guillemot	*Uria aalge*	2015	6	1.962	Bonn, LBAP (CON, PEM), WBAm(RSPB), UKBAm(RSPB)
ST1767	Common kestrel	*Falco tinnunculus*	2015	46	0.552	NERC, WBR(RSPB), LBAP, UKBAm(RSPB)
ST17466923	Common kingfisher	*Alcedo atthis*	2014	38	0.398	BDir1, WCA1.1, LBAP, WBAm(RSPB), UKBAm(RSPB)
ST173691	Common pochard	*Aythya ferina*	2014	172	0.202	WBR(RSPB), LBAP UKBAm(RSPB)
ST1769	Common redshank	*Tringa totanus*	2009	1	0.582	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST1769	Common redstart	*Phoenicurus phoenicurus*	2015	19	0.552	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST168675	Common sandpiper	*Actitis hypoleucos*	2015	13	0.552	Bonn, Bern, WBAm(RSPB), UKBAm(RSPB)
ST1967	Common scoter	*Melanitta nigra*	2013	8	1.962	WCA1.1, NERC, UKBAP, LBAP, WBAm(RSPB), UKBR(RSPB)
ST1769	Common shelduck	*Tadorna tadorna*	2013	8	0.552	LBAP WBAm(RSPB), UKBAm(RSPB)
ST175691	Common snipe	*Gallinago gallinago*	2014	33	0.576	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST159685	Common starling	*Sturnus vulgaris*	2015	16	0.282	NERC, UKBAP, WBR(RSPB), LBAP, UKBR(RSPB)
ST1769	Common swift	*Apus apus*	2015	80	0.302	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST1769	Common tern	*Sterna hirundo*	2013	7	0.582	BDir1, WBR(RSPB), LBAP UKBAm(RSPB)
ST175691	Common whitethroat	*Sylvia communis*	2015	134	0.302	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST1868	Corn bunting	*Emberiza calandra*	2014	1	0.552	NERC, UKBAP, WBR(RSPB), LBAP UKBR(RSPB)
ST1967	Dunlin	*Calidris alpina*	2015	1	1.962	WBR(RSPB), LBAP UKBR(RSPB), UKBAm(RSPB)
ST159685	Eurasian curlew	*Numenius arquata*	2015	14	0.282	NERC, UKBAP, (UK), WBR(RSPB), LBAP, UKBAm(RSPB)
ST1769	Eurasian hobby	*Falco subbuteo*	2015	13	0.302	WCA1.1, LBAP, WBAm(RSPB)
ST1868	Eurasian marsh harrier	*Circus aeruginosus*	2015	1	0.552	BDir1, WCA1.1, LBAP WBAm(RSPB), UKBAm(RSPB)
ST1667	Eurasian oystercatcher	*Haematopus ostralegus*	2013	27	0.552	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST175691	Eurasian teal	*Anas crecca*	2013	57	0.398	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST175691	Eurasian wigeon	*Anas penelope*	2015	50	0.398	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST1769	Eurasian woodcock	*Scolopax rusticola*	2011	2	0.552	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST1769	Eurasian wryneck	*Jynx torquilla*	2013	6	0.552	WCA1.1, UKBAP, UKBR(RSPB)
ST1868	European bee-eater	*Merops apiaster*	2008	1	0.552	WCA1.1
ST1868	European golden plover	*Pluvialis apricaria*	2015	4	0.552	BDir1, NERC, WBR(RSPB), LBAP, UKBAm(RSPB)
ST1866+	European shag	*Phalacrocorax aristotelis*	2007	1	2.338	LBAP UKBAm(RSPB)
ST1967	European storm-petrel	*Hydrobates pelagicus*	2014	7	1.962	BDir1, LBAP WBAm(RSPB), UKBAm(RSPB)
ST1769	European turtle dove	*Streptopelia turtur*	2013	8	0.582	NERC, UKBAP, WBR(RSPB), LBAP, UKBR(RSPB)
ST1767	Fieldfare	*Turdus pilaris*	2015	61	0.181	WCA1.1, LBAP WBAm(RSPB), UKBR(RSPB), UKBAm(RSPB)

ST1769	Firecrest	*Regulus ignicapilla*	2015	10	0.582	WCA1.1, LBAP, WBAm(RSPB), UKBAm(RSPB)
ST1769	Gadwall	*Anas strepera*	2014	46	0.582	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST1769	Garden warbler	*Sylvia borin*	2014	38	0.552	LBAP WBAm(RSPB)
ST1769	Garganey	*Anas querquedula*	2015	7	0.582	WCA1.1, LBAP WBAm(RSPB), UKBAm(RSPB)
ST175691	Goldcrest	*Regulus regulus*	2015	71	0.398	LBAP WBAm(RSPB), UKBAm(RSPB)
ST1769	Great bittern	*Botaurus stellaris*	2009	25	0.582	BDir1, WCA1.1, NERC, UKBAP, LBAP, WBAm(RSPB), UKBR(RSPB)
ST168675	Great black-backed gull	*Larus marinus*	2015	13	0.302	WBR(RSPB), UKBAm(RSPB)
ST17366922	Great cormorant	*Phalacrocorax carbo*	2015	66	0.209	LBAP WBAm(RSPB), UKBAm(RSPB)
ST1769	Great northern diver	*Gavia immer*	2010	6	0.507	BDir1, WCA1.1, LBAP WBAm(RSPB), UKBAm(RSPB)
ST1869	Great skua	*Stercorarius skua*	2013	14	0.302	LBAP, UKBAm(RSPB)
ST173691	Greater scaup	*Aythya marila*	2015	63	0.398	WCA1.1, UKBAP, LBAP, WBAm(RSPB), UKBR(RSPB), UKBAm(RSPB)
ST1967	Greater white-fronted goose	*Anser albifrons*	2010	2	1.962	NERC, UKBAP WBR(RSPB), LBAP (BBNP), UKBAm(RSPB)
ST1868	Green sandpiper	*Tringa ochropus*	2008	2	0.552	WCA1.1, LBAP UKBAm(RSPB)
ST174695	Green woodpecker	*Picus viridis*	2015	123	0.282	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST1866+	Grey plover	*Pluvialis squatarola*	2009	2	2.3380.339	WBR(RSPB), LBAP UKBAm(RSPB)
ST1769	Grey wagtail	*Motacilla cinerea*	2015	28	0.552	LBAP, UKBAm(RSPB)
ST1769	Greylag goose	*Anser anser*	2011	7	0.582	W&CA, (UK), LBAP (CON), UKBAm(RSPB)
ST1769	Hawfinch	*Coccothraustes coccothraustes*	2012	7	0.552	NERC, UKBAP, LBAP, WBAm(RSPB), UKBR(RSPB), UKBAm(RSPB)
ST169695	Hedge accentor	*Prunella modularis*	2015	72	0.181	NERC, UKBAP, (UK), LBAP UKBAm(RSPB)
ST1769	Hen harrier	*Circus cyaneus*	2007	1	0.582	NERC, WBR(RSPB), LBAP, UKBR(RSPB)
ST1769	House martin	*Delichon urbicum*	2015	102	0.302	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST163677	House sparrow	*Passer domesticus*	2015	49	0.552	NERC, UKBAP, LBAP, WBAm(RSPB), UKBR(RSPB)
ST1868	Lapland longspur	*Calcarius lapponicus*	2011	1	0.552	WCA1.1 , WBAm(RSPB), UKBAm(RSPB)
ST1866+	Leach's storm-petrel	*Oceanodroma leucorhoa*	2009	1	2.338	BDir1, WCA1.1, LBAP WBAm(RSPB), UKBAm(RSPB)
ST1667	Lesser black-backed gull	*Larus fuscus*	2015	92	0.209	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST175691	Lesser redpoll	*Acanthis cabaret*	2015	26	0.398	NERC, UKBAP, WBR(RSPB), LBAP, UKBR(RSPB), UKBAm(RSPB)
ST1767	Linnet	*Linaria cannabina*	2015	85	0.551	NERC, WBR(RSPB), LBAP, UKBR(RSPB)
ST1667	Little egret	*Egretta garzetta*	2015	9	0.373	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST1769	Little gull	*Hydrocoloeus minutus*	2014	6	0.209	WCA1.1, LBAP WBAm(RSPB), UKBAm(RSPB)
ST1967	Long-tailed skua	*Stercorarius longicaudus*	2013	1	1.962	BDir1, LBAP UKBAm(RSPB)
ST1669	Long-tailed tit	*Aegithalos caudatus*	2015	100	0.181	WBAm(RSPB)
ST173691	Mallard	*Anas platyrhynchos*	2015	50	0.209	WBAm(RSPB)
ST1868	Manx shearwater	*Puffinus puffinus*	2015	27	0.302	LBAP WBAm(RSPB), UKBAm(RSPB)

ST169695	Marsh tit	*Poecile palustris*	2015	12	0.552	NERC, UKBAP, WBR(RSPB), LBAP UKBR(RSPB)
ST1769	Meadow pipit	*Anthus pratensis*	2015	82	0.551	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST163677	Mediterranean gull	*Larus melanocephalus*	2015	30	0.302	BDir1, WCA1.1, LBAP WBAm(RSPB), UKBAm(RSPB)
ST1769	Merlin	*Falco columbarius*	2015	8	0.552	BDir1, WCA1.1, LBAP WBAm(RSPB), UKBAm(RSPB)
ST173691	Mew gull	*Larus canus*	2015	56	0.302	WBR(RSPB), UKBAm(RSPB)
ST176689	Mistle thrush	*Turdus viscivorus*	2015	70	0.181	UKBAm(RSPB)
ST173691	Mute swan	*Cygnus olor*	2015	73	0.209	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST1769	Northern fulmar	*Fulmarus glacialis*	2015	21	0.302	LBAP, UKBAm(RSPB)
ST1868	Northern gannet	*Morus bassanus*	2015	28	0.302	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST169695	Northern goshawk	*Accipiter gentilis*	2015	4	0.552	WCA1.1, LBAP
ST1769	Northern lapwing	*Vanellus vanellus*	2014	10	0.552	UKBAP, WBR(RSPB), LBAP, UKBR(RSPB), UKBAm(RSPB)
ST1769	Northern pintail	*Anas acuta*	2012	5	0.582	W&CA, LBAP WBAm(RSPB), UKBAm(RSPB)
ST175691	Northern shoveler	*Anas clypeata*	2014	90	0.398	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST1769	Northern wheatear	*Oenanthe oenanthe*	2015	25	0.552	LBAP WBAm(RSPB), UKBAm(RSPB)
ST1769	Osprey	*Pandion haliaetus*	2009	1	0.582	BDir1, WCA1.1, LBAP, WBAm(RSPB), UKBAm(RSPB)
ST1769	Peregrine falcon	*Falco peregrinus*	2015	29	0.282	BDir1, WCA1.1, LBAP, UKBAm(RSPB)
ST1769	Pied avocet	*Recurvirostra avosetta*	2009	1	0.582	BDir1, WCA1.1, WBAm(RSPB), UKBAm(RSPB)
ST1769	Pied flycatcher	*Ficedula hypoleuca*	2014	1	0.582	NERC, WBR(RSPB), LBAP UKBAm(RSPB)
ST1769	Pink-footed goose	*Anser brachyrhynchus*	2012	12	0.582	UKBAm(RSPB)
ST1967	Purple sandpiper	*Calidris maritima*	2009	1	1.962	WCA1.1, LBAP UKBAm(RSPB)
ST1967	Razorbill	*Alca torda*	2013	4	1.962	LBAP UKBAm(RSPB)
ST1769	Red kite	*Milvus milvus*	2015	9	0.552	BDir1, WCA1.1, LBAP WBAm(RSPB), UKBAm(RSPB)
ST1769	Red-breasted merganser	*Mergus serrator*	2008	1	0.582	LBAP WBAm(RSPB)
ST1967	Red-throated diver	*Gavia stellata*	2008	1	1.962	BDir1, WCA1.1, LBAP WBAm(RSPB), UKBAm(RSPB)
ST175691	Redwing	*Turdus iliacus*	2015	124	0.052	WCA1.1, LBAP WBAm(RSPB), UKBR(RSPB), UKBAm(RSPB)
ST17566904	Reed bunting	*Emberiza schoeniclus*	2015	94	0.202	NERC, UKBAP, LBAP WBAm(RSPB), UKBR(RSPB), UKBAm(RSPB)
ST1769	Ring ouzel	*Turdus torquatus*	2015	10	0.552	NERC, UKBAP, Bern, WBR(RSPB), LBAP (BBNP, CON, DEN, FLI, GWY, POW, VOG), LI(VC43), UKBR(RSPB)
ST168675	Ringed plover	*Charadrius hiaticula*	2014	3	0.202	NERC LBAP WBAm(RSPB), UKBAm(RSPB)
ST1667	Ruddy turnstone	*Arenaria interpres*	2015	7	1.677	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST1868	Ruff	*Calidris pugnax*	2015	1	0.552	WCA1.1, LBAP, WBAm(RSPB), UKBR(RSPB), UKBAm(RSPB)
ST1769	Sand martin	*Riparia riparia*	2015	98	0.294	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST1868	Sanderling	*Calidris alba*	2013	1	0.552	LBAP, WBAm(RSPB)
ST1868	Sandwich tern	*Sterna sandvicensis*	2012	10	0.302	LBAP WBAm(RSPB), UKBAm(RSPB)

ST179683	Short-eared owl	*Asio flammeus*	2015	3	0.435	WBR(RSPB), LBAP UKBAm(RSPB)
ST161684	Skylark	*Alauda arvensis*	2015	68	0.552	NERC, LBAP, WBAm(RSPB), UKBR(RSPB)
ST1769	Slavonian grebe	*Podiceps auritus*	2011	1	0.582	WCA1.1, WBAm(RSPB), UKBAm(RSPB)
ST1967	Snow bunting	*Plectrophenax nivalis*	2010	1	1.962	WCA1.1, LBAP WBAm(RSPB), UKBAm(RSPB)
ST175691	Song thrush	*Turdus philomelos*	2015	26	0.181	NERC UKBAP, LBAP, WBAm(RSPB), UKBR(RSPB
ST1769	Spotted flycatcher	*Muscicapa striata*	2015	32	0.552	NERC, UKBAP, WBR(RSPB), LBAP, UKBR(RSPB
ST1767	Stock pigeon	*Columba oenas*	2014	24	0.282	LBAP UKBAm(RSPB)
ST1769	Stonechat	*Saxicola rubicola*	2015	35	0.302	LBAP LBAP UKBAm(RSPB)
ST1867	Tree pipit	*Anthus trivialis*	2015	30	0.552	NERC, UKBAP, LBAP, WBAm(RSPB), UKBR(RSPB), UKBAm(RSPB)
ST173691	Tufted duck	*Aythya fuligula*	2015	213	0.209	LBAP, WBAm(RSPB), UKBAm(RSPB)
ST174692	Water rail	*Rallus aquaticus*	2014	58	0.302	LBAP, (UKBAm(RSPB)
ST1667	Whimbrel	*Numenius phaeopus*	2015	9	0.552	WCA1.1, LBAP, WBAm(RSPB), UKBR(RSPB), UKBAm(RSPB)
ST173691	Whooper swan	*Cygnus cygnus*	2012	33	0.582	WCA1.1, LBAP, UKBAm(RSPB)
ST1868	Willow tit	*Poecile montana*	2015	2	0.552	NERC, UKBAP, WBR(RSPB), LBAP UKBR(RSPB)
ST175691	Willow warbler	*Phylloscopus trochilus*	2015	104	0.282	WBR(RSPB), LBAP (CON), UKBAm(RSPB)
ST1769	Woodlark	*Lullula arborea*	2015	12	0.552	WCA1.1, NERC UKBAP, LBAP, UKBR(RSPB), UKBAm(RSPB)
ST1868	Wood sandpiper	*Tringa glareola*	2010	1	0.552	BDir1, WCA1.1, LBAP, UKBAm(RSPB)
ST1769	Wood warbler	*Phylloscopus sibilatrix*	2015	3	0.552	NERC, UKBAP, WBR(RSPB), LBAP, UKBR(RSPB), UKBAm(RSPB)
ST163677	Yellow wagtail	*Motacilla flava*	2015	22	0.552	NERC, UKBAP, WBR(RSPB), LBAP UKBR(RSPB), UKBAm(RSPB)
ST1868	Yellowhammer	*Emberiza citrinella*	2015	7	0.552	NERC, UKBAP, WBR(RSPB), LBAP, UKBR(RSPB)