

MONA OFFSHORE WIND PROJECT

Preliminary Environmental Information Report

Volume 7, annex 24.3: Onshore ornithology - breeding birds technical report



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FINAL

Image of an offshore wind farm

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Glossary

Term	Meaning
Access parcels	Areas of private land where access had to be sought from the landowner.
Birds Of Conservation Concern 5 (BOCC5)	A list of species of UK populations which are endangered or in decline, or internationally sensitive species.
Cofnod	North Wales Environmental Information Service.
Ground truth	To check the accuracy of remotely sensed data by means of in-situ observation.
Local Environmental Records Centre (LERC)	Where all biological records of local wildlife sightings are collated.
Mean High Water Spring (MHWS)	The average height of spring high tides, as marked on OS maps.
Public access	Areas that were accessible by surveyors using public roads and footpaths.
Site of Special Scientific Interest	An area protected under law for its for its nationally important biological or geological features.
Special Protection Area (SPA)	An area protected under law for its internationally or nationally important numbers of migratory bird species.
Territory analysis	A method of recognising probable breeding attempt by a bird using the territorial registrations noted down during survey.

Acronyms

Acronym	Description
AON	Apparently Occupied Nests
BOCC	Birds of Conservation Concern
BTO	British Trust for Ornithology
CBC	Common Bird Census
CoCP	Code of Construction Practice
EC	European Council
GIS	Geographic Information System
LERC	Local Environmental Records Centre
LWSs	Local Wildlife Sites
MHWS	Mean High Water Spring
MLWS	Mean Low Water Spring
NNRs	National Nature Reserves
PRoW	Public Rights of Way
pSPAs	Potential SPAs
SPA	Special Protection Area

Acronym	Description
SSSI	Site of Special Scientific Interest

Units

Unit	Description
%	Percentage
ha	Hectares
m ²	Square metres

1 ONSHORE ORNITHOLOGY BREEDING BIRDS TECHNICAL REPORT

1.1 Introduction

1.1.1 Background

1.1.1.1 Mona Offshore Wind Limited (the Applicant), a joint venture of bp Alternative Energy investments Ltd (hereafter referred to as bp) and Energie Baden-Württemberg AG (hereafter referred to as EnBW) is developing the Mona Offshore Wind Project. The Mona Offshore Wind Project is a proposed offshore wind farm located in the east Irish Sea. The Mona Proposed Onshore Development Area is located between Llandulas on the North Wales coast and St Asaph to the south of Rhyl, straddling two local authorities, Conwy and Denbighshire (Figure 1.1).

1.1.1.2 The Mona Proposed Onshore Development Area runs inland from the Mona Proposed Landfall, for approximately 18km (Figure 1.2). The west end of the Mona Proposed Onshore Development Area starts at Mean High Water Spring (MHWS) where it lies adjacent to the boundary of the Liverpool Bay Special Protection Area (SPA) and is approximately 10.6km southwest from the Dee Estuary Special Protection Area SPA and Ramsar (Figure 1.1). These sites are of international importance for waterbird species, primarily during migration or over-wintering periods, but also for a small number of species during the breeding season (and therefore relevant to this Technical Report).

1.1.1.3 In contrast to the importance of these intertidal and offshore habitats, eastwards and onshore from the Mona Proposed Landfall, and inland from the Clwyd valley to its terminus at Bodelwyddan, the Mona Proposed Onshore Development Area is only of local value to breeding birds, consisting mainly of improved pasture used for sheep grazing and arable farming (Figure 1.2). The fields are ornithologically impoverished and of negligible value for breeding bird species recorded (see 1.2.1.7 for the criterion used to determine the list of species recorded). Patches of woodland and stretches of hedgerow are better quality habitat but are still only of local importance for breeding species. There are no major watercourses and very limited wetland habitat.

1.1.1.4 The purpose of this technical report is to present baseline data on the breeding birds recorded along the Mona Proposed Onshore Development Area. It describes the methods used to characterise the baseline bird interests and habitats and presents the results of the desk-based studies and the 2022 breeding bird surveys undertaken at the Mona Offshore Wind Project.

1.1.1.5 This baseline information has been used to inform the assessment reported in Volume 3, Chapter 24: Onshore and intertidal ornithology of the Preliminary Environmental Information Report (PEIR).

1.1.1.6 Throughout this report the order in which birds are presented is based upon the widely used Voous order (Voous 1977), which lists birds by broad categories based on their physiology and ecology.

1.1.2 Onshore ornithology breeding birds search area

1.1.2.1 In this report, there are two specific terms used to identify areas used for baseline data collection. The onshore ornithology breeding birds search area covers:

1. Internationally designated ornithological sites, specifically Special Protection Areas (SPAs), potential SPAs (pSPAs), and Ramsar sites located within 20km of the Mona Proposed Onshore Development Area (Figure 1.1).
2. Nationally designated sites, specifically Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs), located within 5km of the Mona Proposed Onshore Development Area (Figure 1.1).
3. Locally designated sites, specifically Local Nature Reserves (LNRs) and Local Wildlife Sites (LWSs), located within 2km of the Mona Proposed Onshore Development Area.

1.1.2.2 However, no locally designated sites, including LNRs and LWSs relevant to ornithology have been identified within 2km of the Mona Proposed Onshore Development Area.

1.1.3 Onshore ornithology breeding birds study area

1.1.3.1 The second area is the Mona Proposed Onshore Development Area plus a 250 metre (m) buffer. The 250m buffer is included to take account of bird interests that may occur adjacent or close to the Mona Proposed Onshore Development Area. This distance is based on potential disturbance distances for recorded species from Hötter, *et. al.*, 2006; Cutts, *et. al.*, 2013, and Goodship and Furness, 2022.

1.1.4 Relevant legislation

1.1.4.1 There are three main pieces of legislation that protect breeding birds and their nests under UK and Welsh law, namely the Conservation of Habitats and Species Regulations 2017 (as amended), the Environment (Wales) Act 2016 and the Wildlife and Countryside Act (1981), as amended.

1.1.4.2 European Council Directive 2009/147/EC (otherwise known as the Birds Directive) recognised that habitat loss and degradation are the most serious threats to the conservation of wild birds. It stated that all member States must designate Special Protection Areas (SPAs) for the survival of all Annex 1 species, sub-species, and all migratory bird species. After the UK left the European Union certain elements of the Birds Directive were transposed into UK law through the Conservation of Habitats and Species Regulations 2017 (as amended). This has created a national site network to ensure continued protection for existing SPAs and to any new sites designated under these Regulations.

1.1.4.3 Section 7 under Part 1 of the Environment (Wales) Act 2016 requires Welsh Ministers to 'publish, review and revise lists of living organisms and types of habitats in Wales, which they consider are of key significance to sustain and improve biodiversity in relation to Wales'. The Welsh Ministers must also take all reasonable steps to maintain and enhance the living organisms and types of habitats included in any list published under this section and encourage others to take such steps.

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1.1.4.4 All wild birds, their nests and their eggs are protected under the Wildlife and Countryside Act (1981), as amended. This legislation makes it an offence to intentionally or recklessly:

- kill, injure, or take any wild bird (excluding certain specified game and other licence-controlled species).
- take, damage, destroy or otherwise interfere with the nest of any wild bird while it is in use or being built.
- obstruct or prevent any wild bird from using its nest.
- take or destroy the egg of any wild bird.

In addition, for birds listed on Schedule 1 of the Wildlife and Countryside Act (1981), it is also an offence to intentionally or recklessly:

- disturb any species listed under Schedule 1 of the Act whilst at the nest site, or while building a nest.
- disturb the dependent young of any species listed under Schedule 1.
- disturb any species listed under Schedule 1 which leks while it is doing so (lekking is a form of communal display used by species such as black grouse *Lyrurus tetrix* and ruff *Philomachus pugnax*. Leks are the areas used for display).

1.1.5 Consultation

1.1.5.1 No consultation to agree survey methodologies for onshore wintering and migratory birds surveys has taken place pre-submission of the PEIR. However, onshore wintering and migratory birds have been discussed with stakeholders through the Onshore Ecology Expert Working Group (EWG) meetings, which were used as a platform to share survey findings. The Onshore Ecology EWG will be used to agree the scope and methodology of further surveys (if required) following PEIR responses.

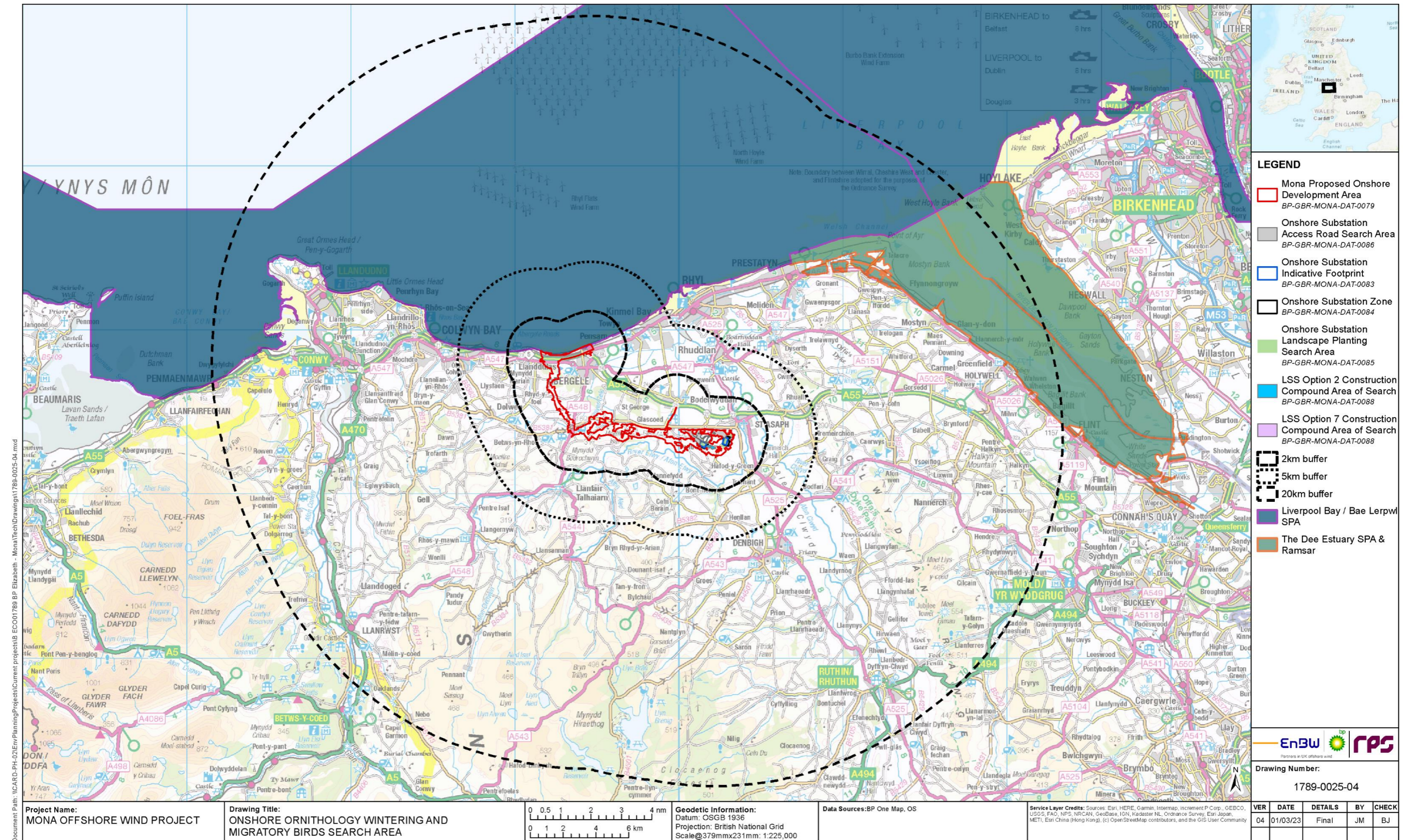


Figure 1.1: Onshore ornithology breeding birds search area.



Figure 1.2: Onshore ornithology breeding birds study area.

1.2 Methodology

1.2.1 Desktop study methodology

1.2.1.1 Information on breeding birds within the onshore ornithology breeding birds search area and study area was collected through a desktop review of the existing studies and datasets summarised in Table 1.1 below.

Table 1.1: Summary of key desktop sources.

Title	Source	Year	Author
Bird Atlas 2007-11	BTO	2013	Balmer, D., Gillings, S., Caffrey, B., Swann, B., Downie, I., Fuller, R.
Welsh Bird Report – 2018.	Welsh Ornithological Society website	Published 2019	Welsh Ornithological Society
The status of our bird populations: the fifth Birds of Conservation Concern (BOCC) in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain.	British Birds	2021	Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I.
Birds of Conservation Concern Wales 4: the population status of birds in Wales	Milvus	2022	Johnstone, I.G., Hughes, J., Balmer, D., Brenchley, A., Facey, R.J., Lindley, P.J., Noble, D.G., Taylor, R.
The Breeding Bird Survey 2021	BTO	2022	Harris, S.J., Massimino, D., Balmer, D.E., Kelly, L., Noble, D.G., Pearce-Higgins, J.W., Woodcock, P., Wotton, S. and Gillings, S.
Bird records for Mona Proposed Onshore Development Area plus 2km buffer	Local Environmental Records Centre's (LERC) supplied by Cofnod	2022	N/A

1.2.1.2 As noted in section 1.1.2, internationally designated sites were identified up to 20km from the Mona Proposed Onshore Development Area, and citations reviewed to identify those with breeding bird interests. Consideration was then given to potential connectivity between the designated site's habitats and qualifying species and the Mona Proposed Onshore Development Area using guidance set out by Scottish Natural Heritage (Scottish Natural Heritage, 2016).

1.2.1.3 To also assist with the assessment of effects of the Mona Proposed Onshore Infrastructure Development on breeding birds, the onshore ornithology breeding birds study area was divided into broad habitat types likely to share comparable breeding bird assemblages. This used known breeding habitat preferences of lowland bird species recorded in this part of the UK, as well as known distributions of breeding birds from the BTO Bird Atlas 2007-11 (Balmer, *et. al.*, 2013).

1.2.1.4 For the resulting breeding species considered likely to be present, consideration was given to their conservation status, specifically whether they were Annex 1 species under the Birds Directive (2009), Schedule 1 species under the Wildlife and Countryside Act (1981), as amended, identified as priority species under the Environment Wales Act (2016) or included as Red or Amber-listed species on the Birds of Conservation Concern 5 (Stanbury *et al.* 2021), hereafter called BOCC UK, or Red and Amber-listed species on the Birds of Conservation Concern 4 (Johnstone, *et. al.*, 2022), hereafter called BOCC Wales. Their status and trends locally were also checked using the 2021 Breeding Bird Survey Report (Harris, *et. al.*, 2022) and the Welsh Ornithological Societies' 'Birds in Wales 2018' county lists (Welsh Ornithological Society, 2019).

1.2.1.5 The final part of the desk study was to obtain records from the Cofnod (North Wales Environmental Information Service). Data supplied were bird records within 2km of the Mona Proposed Onshore Development Area recorded since 2010.

1.2.1.6 The result of this desk study phase was a robust understanding of the broad habitat types and the associated breeding bird assemblage likely to occur within the onshore ornithology breeding birds study area which informed the list of species recorded during the breeding bird surveys.

1.2.1.7 A full list of species recorded during field surveys comprised species identified as potentially present from any of the categories below, in addition to species that were identified with local sensitivities during the desk top study and associated with the habitat types present (Table 1.7):

- EU Birds Directive Annex I and regularly occurring migratory species
- Schedule 1 of the Wildlife and Countryside Act
- Section 7 species of the Environment (Wales) Act 2016
- A qualifying interest of a nearby SPA or SSSI
- Red or Amber-listed Birds of Conservation Concern (BOCC5) (Stanbury *et al.* 2021).

1.2.1.8 To focus field survey efforts and subsequent territory analysis on species of conservation importance, as described above, species which were of relatively low conservation concern and Green listed Birds of Conservation Concern (BoCC5) (Stanbury *et al.* 2021) were not recorded, e.g., Blackbird *Turdus merula* and Robin *Erithacus rubecula*. The full list of species to be recorded comprised 98 species in total.

1.2.2 Field survey methodology

1.2.3 Overview

1.2.3.1 Figure 1.3 outlines the coverage of the onshore ornithology breeding birds study area during the 2022 breeding bird survey, which took place between April and July 2022. This was achieved through a combination of surveys from Public Rights of Way (PRoW) and private land where access was agreed. Through this combination of coverage, robust survey data were obtained from across the majority of the onshore ornithology breeding birds study area.

1.2.4 PRow full breeding bird surveys

- 1.2.4.1 Where access to the onshore ornithology breeding birds study area was not agreed prior to breeding season surveys, PRowWs were used to survey the area and adjacent habitats. Details of breeding bird surveys completed from PRowWs are provided in Table 1.2 below. Four survey visits were undertaken between April and August 2022, using the Common Bird Census (CBC) method (Gilbert, *et. al.* 1998).
- 1.2.4.2 Survey visits were conducted at least 10 days apart. The position of each recorded bird was plotted onto a field map and details of behaviour, including behaviour indicative of breeding (such as singing males, or birds carrying food) were noted using standard BTO behaviour notation. Results were then transferred onto Geographic Information System (GIS) software to identify and map putative territory centres.
- 1.2.4.3 The location and extent of survey visits undertaken to date is presented in Figure 1.3 below.

Table 1.2: Summary of PRow full breeding bird surveys.

Date	Time	Weather
15 April 2022	06:00 - 09:00	Light air, no rain, cloud, cool
19 April 2022	06:00 - 11:00	Light air, no rain, fairly clear, cool
21 April 2022	06:00 - 11:00	Light air, no rain, fairly clear, cool
22 April 2022	06:00 - 11:00	Light air, no rain, cloudy, cool
22 April 2022	06:00 - 11:00	Light breeze, occasional drizzle, cloudy, cool
23 April 2022	06:00 - 11:00	Light breeze, no rain, light cloud, warm
23 April 2022	06:00 - 11:00	Light breeze, no rain, light cloud, warm
25 April 2022	06:00 - 11:00	Light air, no rain, light cloud, cool
29 April 2022	06:00 - 11:00	Light breeze, no rain, light cloud, cool start
30 April 2022	06:00 - 11:00	Light air, occasional showers, light cloud, cool
07 May 2022	06:00 - 11:00	Light air, no rain, light cloud, warm
08 May 2022	06:00 - 11:00	Light air, no rain, light cloud, warm
09 May 2022	08:00 - 10:00	Light air, no rain, medium cloud, warm
12 May 2022	06:00 - 11:00	Light air, no rain, cloudy, warm
13 May 2022	06:00 - 11:00	Gentle breeze, no rain, medium cloud, warm
14 May 2022	06:00 - 11:00	Light air, no rain, light cloud, warm
15 May 2022	06:00 - 11:00	Light breeze, no rain, cloudy, warm
16 May 2022	06:00 - 11:00	Light breeze, rain showers, cloudy, warm
21 May 2022	06:00 - 11:00	Light breeze, no rain, cloudy, warm
30 May 2022	06:00 - 11:00	Moderate breeze, rain showers, cloudy, cool
31 May 2022	06:00 - 11:00	Gentle breeze, occasional showers, cloudy, cool
04 June 2022	06:00 - 11:00	Light breeze, no rain, cloudy, warm

Date	Time	Weather
10 June 2022	06:00 - 11:00	Moderate breeze, no rain, medium cloud, warm
14 June 2022	06:00 - 11:00	No wind, no rain, cloudy, warm
18 June 2022	06:00 - 11:00	Gentle breeze, occasional drizzle, cloudy, warm
19 June 2022	06:00 - 11:00	Light breeze, no rain, cloudy, warm
19 June 2022	06:00 - 11:00	Light breeze, no rain, cloudy, warm
20 June 2022	06:00 - 08:00	Light breeze, no rain, light cloud, warm
22 June 2022	06:00 - 10:00	Light air, no rain, light cloud, warm
23 June 2022	06:00 - 11:00	Light air, no rain, no cloud, hot
25 May 2022	06:00 - 11:00	Moderate breeze, no rain, medium cloud, warm
26 June 2022	06:00 - 08:30	Moderate breeze, occasional rain, cloudy, warm
10 July 2022	06:00 - 11:00	Light air, no rain, light cloud, very warm
11 July 2022	06:00 - 11:00	Light air, no rain, no cloud, hot
13 July 2022	06:00 - 11:00	Gentle breeze, no rain, cloudy, hot
15 July 2022	06:00 - 11:00	Gentle breeze, no rain, cloudy, very warm
17 July 2022	06:00 - 11:00	Gentle breeze, no rain, medium cloud, hot
18 July 2022	06:00 - 11:00	Light air, no rain, no cloud, hot
24 July 2022	06:00 - 11:00	Gentle breeze, no rain, cloudy, warm
27 July 2022	06:00 - 11:00	Light breeze, no rain, cloudy, warm
28 July 2022	06:00 - 11:00	Gentle breeze, no rain, cloudy, warm
29 July 2022	06:00 - 11:00	Light breeze, no rain, cloudy, warm

1.2.5 Breeding bird walkover surveys

- 1.2.5.1 Where access to privately owned land parcels was granted, transects were walked as close to 100m of all areas of habitat as possible. As with the PRow surveys, all species were recorded and mapped using standard BTO notation. Results were then transferred onto GIS for territory mapping purposes.
- 1.2.5.2 Access permissions were not obtained in time for the start of the survey season (early March 2022), but nonetheless a minimum of one survey visit was made to privately owned land parcels within the breeding bird survey period. Details of these surveys are shown in Table 1.3 below.
- 1.2.5.3 The location and extent of survey visits undertaken to date is presented in Figure 1.3 below.

Table 1.3: Summary of private land breeding bird walkover surveys.

Date	Time	Weather
25 June 2022	05:05 – 10:40	Moderate breeze, no rain, cloudy
26 June 2022	04:55 – 10:35	Gentle breeze, occasional rain, cloudy
05 July 2022	06:00 – 11:00	Gentle breeze, occasional drizzle, cloudy, warm
05 July 2022	06:00 – 11:00	Gentle breeze, occasional drizzle, cloudy, warm
29 July 2022	06:00 – 11:00	Light breeze, no rain, cloudy, warm
30 July 2022	05:50 – 11:00	Light breeze, no rain, cloudy
31 July 2022	05:55 – 11:50	Light breeze, no rain, medium cloud

1.2.5.4 All surveys were carried out by competent field ornithologists suitably trained and experienced in undertaking the survey methodologies identified in this report.

1.2.6 Territory analysis

1.2.6.1 Territories were assigned following the CBC methods (Gilbert, *et al.*, 1998; and Bibby, *et al.*, 2007). This involves the identification of clusters of registrations of birds of the same species displaying breeding characteristics (e.g. singing, alarm calling, nest building, mating) in the same general area over successive survey visits. A breeding territory is defined as at least two registrations conforming to the above criteria recorded on separate survey visits. However, for early breeders, such as common crossbill *Loxia curvirostra*, species which are only vocal/visible during brief periods, such as lesser spotted woodpecker *Dryobates minor*, or species which may lay eggs and move on, such as cuckoo *Cuculus canorus*. One registration of breeding behaviour was determined as adequate to assign a territory. Territories were only mapped using GIS for recorded species.

1.2.6.2 The results of the territory analysis are provided in Figure 1.5 to Figure 1.24 below. The registrations indicate the putative territory centre and not the location of a nest. Territories are indicative of a breeding attempt and do not confirm successful nesting. Territories are mapped according to BOCC 5 - UK (Stanbury, *et. al*, 2021).

1.2.7 Limitations

1.2.7.1 Although every effort was made to cover the full onshore ornithology breeding birds study area, access to many landholdings, other than by PRow, was not possible until later in the 2022 breeding season.

1.2.7.2 However, all areas with PRow did receive four visits between April and July 2022, so with added insights from desk study results, it is not considered likely that any species being surveyed and present went unrecorded.

1.2.7.3 The baseline data is therefore considered sufficient for the purposes of informing volume 3, chapter 24: Onshore and intertidal ornithology of the PEIR and establishing the requirements for pre-commencement surveys and Bird Protection Plan, which are to be secured as part of the Code of Construction Practice (CoCP).

1.2.7.4 Ecological data can remain valid for short periods due to the transient nature of the subject. The survey results contained in this report are considered accurate at the time of reporting. However, it should be noted that birds may change territories and nest sites on a yearly basis.

1.2.7.5 Whilst every effort has been made to characterise onshore ornithology breeding birds study area in relation to breeding birds it must be noted that no amount of survey effort can fully guarantee a complete characterisation of the natural environment. Therefore, in compilation of this report, we have taken desk-top sources into consideration alongside survey results.

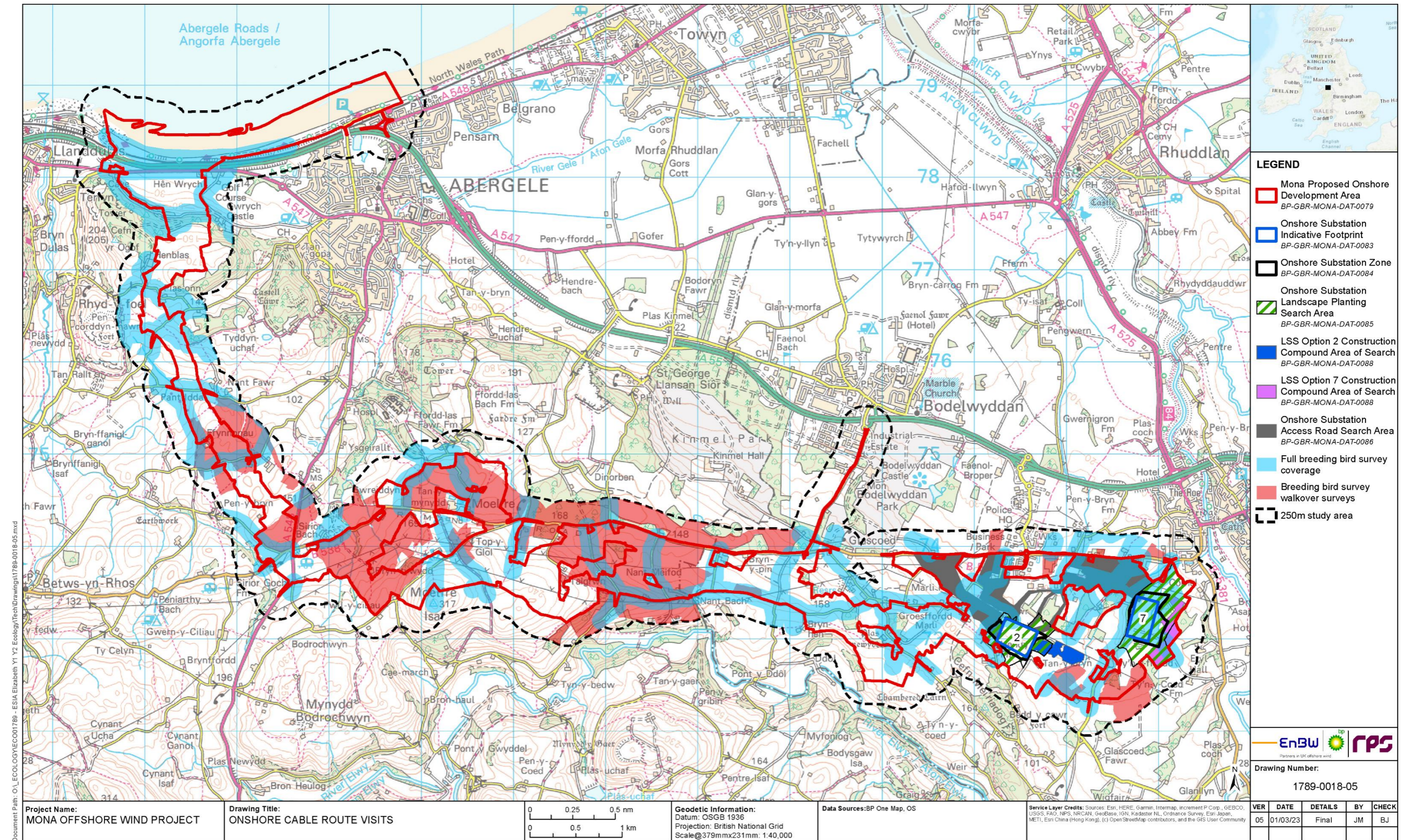


Figure 1.3: Areas covered by the 'full breeding bird survey' (by PRow) and private access 'breeding bird walkover survey' areas.

1.3 Results

1.3.1 Desk top study results

Designated sites

- 1.3.1.1 There are two SPAs and one Ramsar located within 20km of the Mona Proposed Onshore Development Area; The Dee Estuary SPA and Ramsar, and the Liverpool Bay SPA (Table 1.4).
- 1.3.1.2 The Dee Estuary is comprised of extensive areas of intertidal sand/mud flats and saltmarsh. Its main designated features are its large concentrations of wintering and passage wildfowl and waders. However, during the breeding season it also supports nationally important colonies of little tern *Sternula albifrons* and common tern *Sterna hirundo*.
- 1.3.1.3 The Liverpool Bay SPA is an entirely marine SPA. The Liverpool Bay SPA boundary starts at Mean Low Water Spring (MLWS) along the North Welsh coast. Its main designated features are its large concentrations of non-breeding wildfowl and divers along with non-breeding little gull *Hydrocoloeus minutus*. It is regularly used by more than 1% of the United Kingdom’s populations of breeding little tern and common tern for foraging.

Table 1.4: Summary of SPA and Ramsar sites located within 20km of the Mona Proposed Onshore Development Area.

Site name	Designation	Distance	Breeding bird species named in sites citation
Dee Estuary	SPA	10.9km	Little tern
	Ramsar		common tern
Liverpool Bay	SPA	0.2km	Little tern
			common tern

- 1.3.1.1 There is one SSSI with breeding ornithological features of scientific interest located within 5km of the Mona Proposed Onshore Development Area (Table 1.5).
- 1.3.1.2 Coedydd Derw Elwy SSSI contains mid-altitude woodlands on steep valley sides. The breeding birds named in its citation include pied flycatcher *Ficedula hypoleuca*, common redstart *Phoenicurus phoenicurus*, and wood warbler *Phylloscopus sibilatrix*.
- 1.3.1.3 Although the onshore ornithology breeding birds search area specifies a 5km radius for nationally designated sites, SSSIs located within 20km (e.g. the Dee Estuary SSSI which underpins the Dee Estuary SPA) were checked for potential impact pathways. No potential impact pathways were found for other SSSIs located within the 5km or 20km of the Mona Proposed Onshore Development Area.

Table 1.5: Summary of SSSI with ornithological sensitivities located within 20km of the Mona Proposed Onshore Development Area.

Site name	Designation	Distance	Breeding bird species named in sites citation
Coedydd Derw Elwy	SSSI	3.9km	Pied flycatcher common redstart wood warbler

- 1.3.1.4 The desk top study did not identify any locally designated sites (e.g. LNRs, LWSs) with ornithological interests located within 2km of the Mona Proposed Onshore Development Area.

1.3.2 Habitats present

- 1.3.2.1 The results of the habitat mapping exercise are shown in Table 1.6 and Figure 1.4 of this report below.
- 1.3.2.2 The onshore ornithology breeding birds study area is dominated by improved grassland used for sheep grazing and for intensive arable farming. Within this ornithologically impoverished landscape there are small blocks of woodland, scrub and field boundaries comprised of hedgerows of various habitat quality. Small areas of coastal habitats are present at the coast. Within this matrix there are also watercourses and built-up areas.

Table 1.6: Summary of the habitats present within the onshore ornithology breeding birds study area.

Habitat type	Onshore ornithology breeding birds study area (%)
Intertidal	8.5
Sand dunes	0.2
Scrub	1.0
Grassland/pasture	63.5
Arable	9.0
Parkland	2.1
Deciduous woodland	3.2
Mixed woodland	5.8
Ponds	0.1
Built environment	6.6

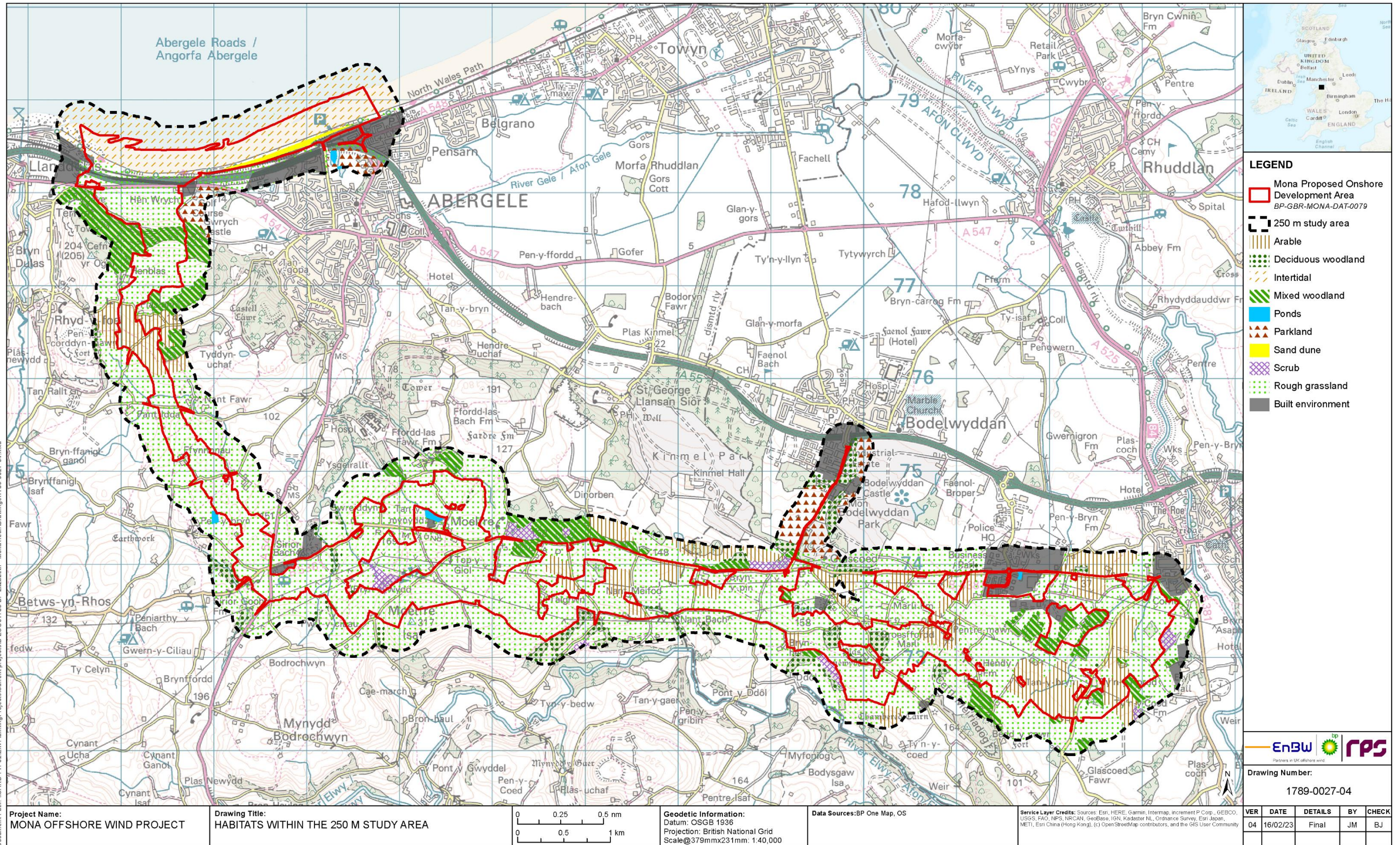


Figure 1.4: Broadscale breeding habitats available within the onshore ornithology breeding birds study area.

1.3.3 Bird assemblages

1.3.3.1 From the desk study examining habitats present, the following assemblages were produced through analysis of known habitat requirements and breeding ranges of breeding birds, as taken from Balmer, *et al.* (2016), Birds in Wales – 2018 (Welsh Ornithological Society, 2019), and the Cofnod records within 2km of the Mona Proposed Onshore Development Area since 2010. Footnotes have been added for notable species. Where no footnote has been added the birds are assumed to be fairly typical for the area.

1.3.3.2 The inclusion of a species within a habitat category does not preclude it from using other habitats and many species may utilise multiple habitats present within the onshore ornithology breeding birds study area. This list of species potentially present in each habitat type was used to help inform the list of species to be recorded during surveys, and the assessment of potential effects. The criteria used to determine a focussed list of species to record is defined in section 1.2.1.7 and includes species potentially present and listed on one or more of the EU Birds EU Birds Directive Annex I and regularly occurring migratory species; Schedule 1 of the Wildlife and Countryside Act; Section 7 species of the Environment (Wales) Act 2016; A qualifying interest of a nearby SPA or SSSI; Red or Amber-listed Birds of Conservation Concern (BoCC5) (Stanbury *et al.*, 2021). Species listed as Green Birds of Conservation Concern (BoCC5) (Stanbury *et al.*, 2021) were not recorded.

Table 1.7: Summary of the habitats available within the onshore ornithology breeding birds study area, and the species to be recorded associated with them.

Habitat type	Description of habitat	Species recorded potentially using this habitat
Grassland/pasture	These habitats are characterised by open space and grass. Most of the grassland/pasture within the onshore ornithology breeding birds study area is composed of homogenous improved pasture with limited habitat value for birds.	Oystercatcher <i>Haematopus ostralegus</i> Lapwing <i>Vanellus vanellus</i> Curlew <i>Numenius arquata</i> Snipe <i>Gallinago gallinago</i>
Arable	These are fertile and often intensively managed crop fields and are unlikely to provide suitable habitat for species except when present as stubble or ley. They are likely to be heavily drained where on low lying or heavy soils and intensification of farming methods has led to a decline in many of the species that specialise in nesting on this habitat. Nonetheless, areas of low intensity arable farming can still support some farmland breeding species.	Quail <i>Coturnix coturnix</i> - Breeding records exist in the region of the onshore ornithology breeding birds study area from 2008 – 2011 (Balmer, <i>et al.</i> , 2013) Skylark <i>Aluda arvensis</i> Yellow wagtail <i>Motacilla flava</i> - A few records exist in the region of onshore ornithology breeding birds study area (Welsh Ornithological Society, 2019). Meadow pipit <i>Anthus pratensis</i>
Hedgerow	Both the arable and pasture fields are generally bounded by hedgerows in the onshore ornithology breeding birds study area. Hedgerows range from dense (often due to regular cutting) or more open. Hedgerows make nesting habitat for mainly small passerine (songbird) species.	Wren <i>Troglodytes troglodytes</i> Dunnock <i>Prunella modularis</i> Willow warbler <i>Phylloscopus trochilus</i> Tree sparrow <i>Passer montanus</i> Yellowhammer <i>Emberiza citrinella</i>

Habitat type	Description of habitat	Species recorded potentially using this habitat
Mixed and coniferous woodland	Main areas of mixed woodland often contain fragments of forestry plantation. Forestry is often dense with a high density of trees per m ² . It typically has little shrubs or herbs due to heavy shading. This provides refuge for some bird species. Forest tracks and clearings provide lighter areas with developed shrub and herb layers. Some birds are specialist feeders on conifers with others exploiting the heath like openings, due to the dense nature of the understory, birds which hunt in these habitats are forest specialists. Many other species of deciduous woodland and hedgerow assemblages will utilise the dense cover and low levels of disturbance for nesting and roosting.	Wood pigeon <i>Columba palumbus</i> Tree pipit <i>Anthus trivialis</i> - Breeding records exist within 20km of the Mona Proposed Onshore Development Area (Balmer, <i>et al.</i> , 2013) Wood warbler - 52% increase in regional records (Welsh Ornithological Society, 2019) Willow tit <i>Poecile montanus</i> - Breeding records exist within 20km of the Mona Proposed Onshore Development Area (Balmer, <i>et al.</i> , 2013) Bullfinch <i>Pyrrhulla pyrrhulla</i> Common crossbill
Deciduous woodland	In amongst the farmland mosaic there are also copses and small woods present. These are largely made up of deciduous tree species with the occasional evergreen such as holly. These typically have a more open canopy, often with a well-developed herb and shrub layer. The complex structure and diversity of food sources allows many species to exploit this habitat.	Red kite <i>Milvus milvus</i> - Possible range expansion since the 2007 – 2011 Bird Atlas (Welsh Ornithological Society, 2019) Sparrowhawk <i>Accipiter nisus</i> Kestrel <i>Falco tinnuculus</i> Woodcock <i>Scolopax rusticola</i> - A few records exist in the region of the onshore ornithology breeding birds study area (Welsh Ornithological Society, 2019) Cuckoo - Breeding records exist within 20km of the Mona Proposed Onshore Development Area (Balmer, <i>et al.</i> , 2013) Tawny owl <i>Strix aluco</i> Lesser spotted woodpecker - Breeding records exist within 20km of the Mona Proposed Onshore Development Area (Welsh Ornithological Society, 2019) Common redstart Mistle thrush <i>Turdus viscivorus</i> Song thrush <i>Turdus philomelos</i> Spotted flycatcher <i>Muscicapa striata</i> Pied flycatcher Rook <i>Corvus frugilegus</i>
Parkland	Parkland or open woodland is characterised by grassland with areas of scrub and spaced trees. Many woodland and hedgerow species will also utilise open parkland.	Hobby <i>Falco subbuteo</i> - Possible breeding records from within 20km of the Mona Proposed Onshore Development Area (Welsh Ornithological Society, 2019) Stock dove <i>Calumba oenas</i> Marsh tit <i>Poecile palustris</i> Starling <i>Sturnus vulgaris</i> Greenfinch <i>Chloris chloris</i>

Habitat type	Description of habitat	Species recorded potentially using this habitat
Scrub	Areas of scrub are characterised by low densities of mature trees allowing a well-developed shrub layer to establish. This may consist of dense bramble <i>Rubus fruticosus</i> in some areas or bracken <i>Pteridium aquilinum</i> in others. The dense cover provides perfect cover for many passerine species to nest amongst	Whinchat <i>Saxicola rubetra</i> - Breeding records exist within 20km of the Mona Proposed Onshore Development Area (Balmer, et al, 2013) Common whitethroat <i>Sylvia communis</i> Linnet <i>Linaria cannabina</i> Lesser redpoll <i>Acanthis cabaret</i>
Sand dunes, and the upper beach	Although the intertidal area cannot be used for breeding due to daily inundation, the upper shore which is covered by bare sand and/or pebbles, and washed-up debris, leads along a gradient to more permanent ground characterised by short grassy vegetation including species such as marram grass <i>Ammophila arenaria</i> provides optimal breeding habitat for some species.	Ringed plover <i>Charadrius hiaticula</i> Great black-backed gull <i>Larus marinus</i> Common tern - Known colony at Shotton with 349 Apparently Occupied Nests (AON) in 2018 (Welsh Ornithological Society, 2019). Dee Estuary SPA breeding feature. Little tern - Known colony at Gronant with 171 nests in 2018 (Welsh Ornithological Society, 2019). Dee Estuary and Liverpool Bay SPA breeding feature.
Freshwater	There are ponds of varying sizes dotted along the Mona Proposed Onshore Development Area along with ditches which may contain common reed <i>Phragmites australis</i> . Some waterfowl species will be found in all sizes of ponds (e.g., mallard, moorhen), whereas other species are more particular about their habitat requirements. Some bird species are traditionally reedbed specialists (Cetti's, grasshopper, sedge warbler, and reed bunting), while others prefer areas of steep banking (kingfisher). Many fowl species will nest on islands and around undisturbed margins of larger ponds.	Shelduck <i>Tadorna tadorna</i> Gadwall <i>Anas strepera</i> - Breeding records exist within 20km of the Mona Proposed Onshore Development Area (Welsh Ornithological Society, 2019) Mallard <i>Anas platyrhynchos</i> Little egret <i>Egretta garzetta</i> - Breeding records exist within 20km of the Mona Proposed Onshore Development Area (Welsh Ornithological Society, 2019) Moorhen <i>Gallinula chloropus</i> Common sandpiper <i>Actitis hypoleucos</i> Black-headed gull <i>Chroicocephalus ridibundus</i> - Breeding records exist within 10km of the Mona Proposed Onshore Development Area (Balmer, et al, 2013) Kingfisher <i>Alcedo atthis</i> - Probable breeding records from within 10km of the Mona Proposed Onshore Development Area (Balmer, et, al., 2013) Grey wagtail <i>Motacilla cinerea</i> Grasshopper warbler <i>Locustella naevia</i> Sedge warbler <i>Acrocephalus schoenobaenus</i> Reed bunting <i>Emberiza schoeniclus</i> Dipper <i>Cinclus cinclus</i>
Built environment	There are numerous buildings along the cable route. Buildings may be of different sizes with some species habitually nesting on roofs and chimneys of inhabited buildings (herring gull), while others inhabit the interiors of derelict farm buildings and barns (barn owl). Swifts and martins utilise	Herring gull <i>Larus argentatus</i> Lesser black-backed gull <i>Larus fuscus</i> Barn owl <i>Tyto alba</i> Swift <i>Apus apus</i> House martin <i>Delichon urbicum</i>

Habitat type	Description of habitat	Species recorded potentially using this habitat
	the eaves of buildings to build their mud nests.	House sparrow <i>Passer domesticus</i> Little ringed plover <i>Charadrius dubius</i> - Breeding records exist within 10km of the Mona Proposed Onshore Development Area (Welsh Ornithological Society, 2019)
Craggs and cliffs	Although limited, there are a few crags situated along the Mona Proposed Onshore Development Area. In addition to crags, peregrines may also be present on pylons.	Peregrine <i>Falco peregrinus</i> Chough <i>Pyrrhonorax pyrrhonorax</i> - Known breeding sites on the Great Orme (Welsh Ornithological Society, 2019).

1.3.4 Local records results

- 1.3.4.1 Records from Cofnod include 49 species that could potentially breed within the onshore ornithology breeding birds study area (Table 1.8).
- 1.3.4.2 The rarest bird with records was hoopoe *Upupa epops*. There are only circa 127 hoopoe UK sightings per year it is considered a rarity and is well outside of its recognised breeding range. As such it is not considered likely that hoopoe breed within the onshore ornithology breeding birds study area.
- 1.3.4.3 All the curlew, oystercatcher, and redshank *Tringa totanus* records are from along the coast. Due to a lack of suitable breeding habitat within the coastal part of the onshore ornithology breeding birds study area, these records are likely to have been of non-breeding birds. Ringed plover are also present at the coast although as they prefer pebble and sand habitats in the upper beach to nest on, they might reasonably represent breeding birds.
- 1.3.4.4 The records for Sandwich tern *Sterna sandvicensis* are likely to be passage birds (autumn passage Sandwich tern are notified on the Dee estuary SPA citation). Although there are records (Balmer, et. al., 2013) of Sandwich tern breeding close to the onshore ornithology breeding birds study area. The only known colony of Sandwich tern in Wales is situated on Cemlyn, Angelsey, located approximately 60km from the onshore ornithology breeding birds study area.
- 1.3.4.5 Most of the records for wheatear *Oenanthe oenanthe* are also from the coast and may represent passage birds. However, this species will breed on short sward lowland grassland so the records could reasonably represent breeding birds. All the other species have distributions that indicate that they may be reasonably assumed to breed within the onshore ornithology breeding birds study area.
- 1.3.4.6 Red kite, hobby, and crossbill breed in woodland. Red kite are usually found in deciduous woodland, often at edges or in clearings and frequently in small blocks of woodland. Hobby also like woodland edges, and copses and will often be found in open woodland/parkland. Crossbill breed in or near coniferous trees which provide their main food source (conifer cones).
- 1.3.4.7 Peregrine and chough are typically cliff nesting species, although both species will use man-made structures also.

1.3.4.8 Kingfisher nests are located in riverbank burrows. Barn owl are frequently found nesting in buildings. Both species may have second broods.

Table 1.8: Summary of the Cofnod local environmental records search.

Species	Number of records	Schedule 1	Annexe 1	Section 7	BOCC - UK	BOCC - Wales
Mute swan <i>Cygnus olor</i>	5				Amber	
Shelduck	1				Amber	Red
Mallard	12				Amber	
Teal <i>Anas crecca</i>	1				Amber	Amber
Red kite	3	✓	✓			
Kestrel	19			✓	Amber	Red
Hobby	1	✓			Amber	
Peregrine	3	✓	✓			
Oystercatcher	21				Amber	Amber
Ringed plover	4			✓	Red	Red
Curlew	6			✓	Red	Red
Redshank	5				Amber	Red
Common sandpiper	1				Amber	Amber
Snipe	3				Amber	Amber
Woodcock	1				Red	Red
Black-headed gull	12			✓		Red
Herring gull	37			✓	Red	Red
Lesser black-backed gull	10				Amber	Red
Great black-backed gull	10				Amber	Amber
Sandwich tern	3		✓		Amber	Amber
Cuckoo	1			✓	Red	Red
Barn owl	10	✓				
Tawny owl	3				Amber	
Swift	15			✓		Red
Hoopoe	1	✓		✓	Amber	Amber
Kingfisher	4	✓	✓			
Lesser spotted woodpecker	2			✓	Red	Red
Skylark	3			✓	Red	Amber

Species	Number of records	Schedule 1	Annexe 1	Section 7	BOCC - UK	BOCC - Wales
House martin	15				Red	Amber
Meadow pipit	5				Amber	Red
Grey wagtail	13				Amber	Amber
Dipper	10				Amber	
Wren	12				Amber	
Dunnock	7			✓	Red	Amber
Common redstart	3				Amber	
Wheatear	4				Amber	Amber
Mistle thrush <i>Turdus viscivorus</i>	5				Red	Amber
Song thrush	9			✓	Amber	
Willow warbler	1				Amber	Red
Marsh tit	5			✓	Red	Red
Willow tit	1			✓	Red	Red
Chough	2	✓	✓	✓		Amber
Starling	8			✓	Red	Red
House sparrow	22			✓	Red	Amber
Linnet	5			✓	Red	Red
Crossbill	1	✓				
Bullfinch	8			✓	Amber	Amber
Reed bunting	2				Amber	
Yellowhammer	1			✓	Red	Red

1.3.5 Field survey results

Territory analysis results

1.3.5.1 A total of 20 species were found to be holding territory or displaying territorial behaviour within the onshore ornithology breeding birds study area. Most of these are common and widespread passerine species (Table 1.9) and none were breeding features of either the Dee Estuary SPA and Ramsar or Liverpool Bay SPA.

1.3.5.2 Two species' present are protected under Schedule 1 of the Wildlife and Countryside Act, (1981), as amended. This makes it illegal 'to intentionally or recklessly disturb these species at, on or near an 'active' nest'. These species are:

- Little ringed plover – one active nest site was located on former industrial ground located approximately 500m northeast from the existing Bodelwyddan National Grid Substation.
- Red kite – there were three locations where red kite were seen displaying possible breeding behaviours over suitable breeding habitat. These were calling, and diving into woodland, both are behaviours that were used during the 2000 national red kite surveys to identify birds potentially occupying territories (Wooton, *et. al.*, 2002).

1.3.5.1 Less common species that were recorded within the onshore ornithology breeding birds study area were cuckoo and spotted flycatcher. Both are Red-listed species, and both named in section 7 of the Environment (Wales) Act 2016.

1.3.5.2 Although many of the species present do not have published disturbance distances, except for red kite (Figure 1.6), the species with the greatest disturbance distance is linnet; Hötter, *et. al.* (2006) found a mean disturbance distance of 135m for this species. Due to the mainly passerine assemblage present, this could therefore be assumed to be the limit of any disturbance effects caused during construction. For red kite, disturbance distances are typically up to 150 to 300m from pedestrian activity or up to 600m for forestry activities (which may be similar to construction activities) (NatureScot, 2022).

1.3.5.3 The results of the territory analysis are provided in Figure 1.5 to Figure 1.24 below. The registrations indicate the putative territory centre and not the location of a nest. Territories are indicative of a breeding attempt and do not confirm successful nesting. Territories are mapped according to BOCC 5 - UK (Stanbury, *et. al.*, 2021).

Table 1.9: Summary of the territory analysis results.

* Territories in 2016 ** Pairs in 2016 *** Pairs in 2007. All estimates taken from Woodward, *et. al.*, 2020. S1 WCA = Schedule 1 of the Wildlife and Countryside Act, 1981 (as amended). A1 BD = Annexe 1 of the Birds Directive (2009). Red and Amber = BOCC5 Red and Amber-listed species. Red and Amber = BOCC4 Welsh Red and Amber-listed species. S7 EWA = section 7 species of the Environment (Wales) Act 2016.

Species	Territories within the onshore ornithology breeding birds study area	Conservation status	UK population	Nesting habitat
Sparrowhawk	1	Amber (BOCC 5 UK)	31,000**	Woodland
Red kite	3	S1 WCA, A1 BD	4,400**	Woodland
Little ringed plover	1	S1 WCA,	1,250***	Pebble beaches and industrial areas
Stock dove	4	Amber (BOCC 5 UK)	320,000*	Parkland and woodland edge
Cuckoo	2	S7 EWA, Red (BOCC UK & Wales)	18,000**	Woodlands, hedges, grassland
Skylark	4	S7 EWA, Red (BOCC UK), Amber (BOCC Wales)	1.6 million*	Rough grassland, pasture and arable
House martin	9	Red (BOCC UK), Amber (BOCC Wales)	480,000**	Buildings

Species	Territories within the onshore ornithology breeding birds study area	Conservation status	UK population	Nesting habitat
Meadow pipit	1	Amber (BOCC UK), Red (BOCC Wales)	2.5 million**	Rough grassland, pasture and arable
Grey wagtail	2	Amber (BOCC UK & Wales)	37,000**	Near fast flowing water
Common redstart	16	Amber (BOCC UK)	135,000**	Woodland and parkland
Mistle thrush	10	Red (BOCC UK), Amber (BOCC Wales)	165,000*	Woodland
Song thrush	30	S7 EWA, Amber (BOCC UK)	1.3 million*	Woodland and hedgerows
Common whitethroat	7	Amber (BOCC UK), Red (BOCC Wales)	1.1 million*	Scrub and hedgerows
Willow warbler	10	Amber (BOCC UK), Red (BOCC Wales)	2.3 million*	Woodlands, scrub, and hedges
Spotted flycatcher	2	S7 EWA, Red (BOCC UK & Wales)	42,000*	Parkland and woodland edge
Starling	1	S7 EWA, Red (BOCC UK & Wales)	1.8 million**	Hedges and buildings
House sparrow	75	S7 EWA, Red (BOCC UK), Amber (BOCC Wales)	5.3 million**	Buildings and hedges
Greenfinch	2	Red (BOCC UK & Wales)	785,000**	Woodland, hedges, parkland
Linnet	6	S7 EWA, Red (BOCC UK & Wales)	560,000*	Scrub and hedges
Bullfinch	9	S7 EWA, Amber (BOCC UK & Wales)	260,000*	Woodland and hedges

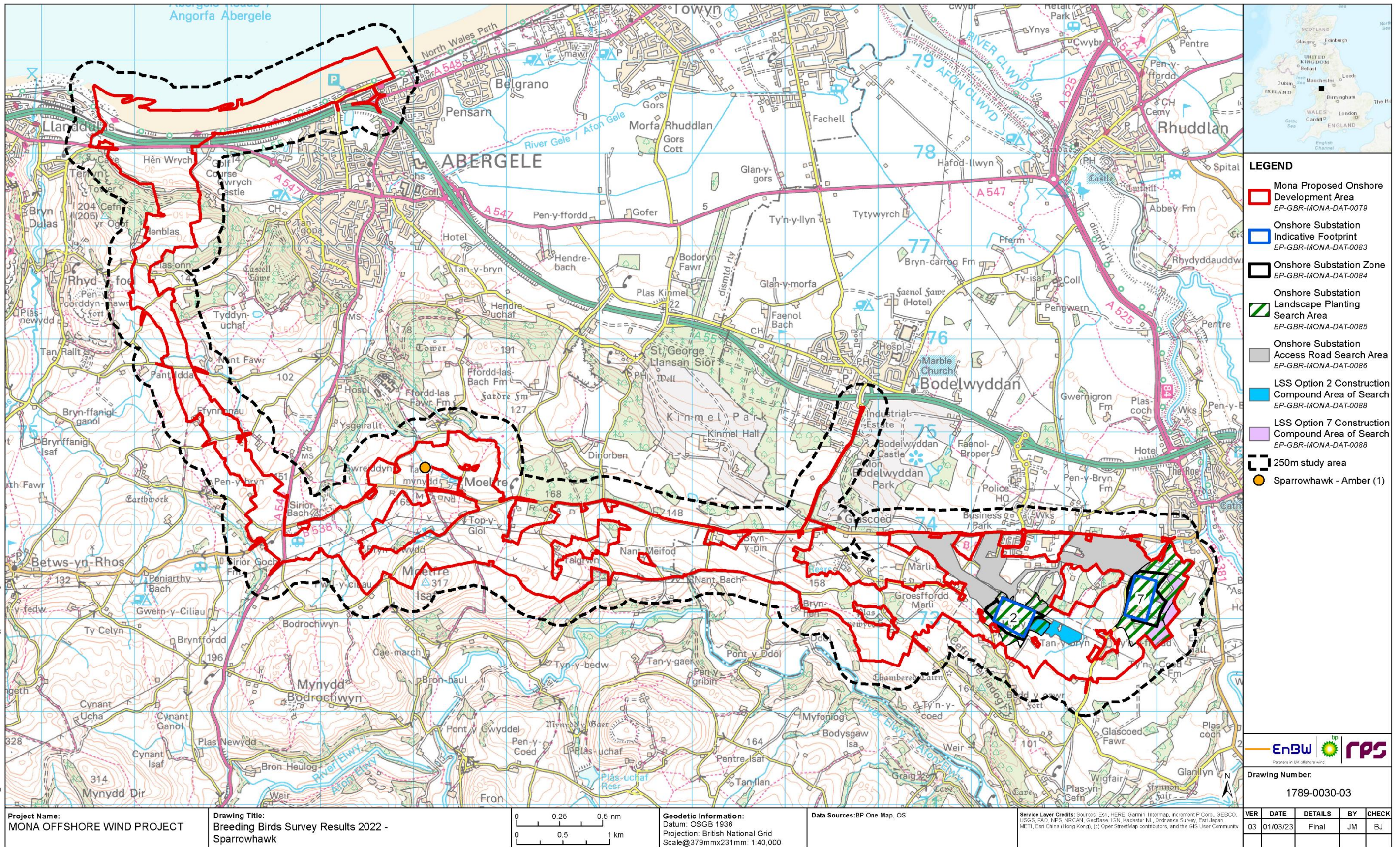


Figure 1.5: Sparrowhawk territories.

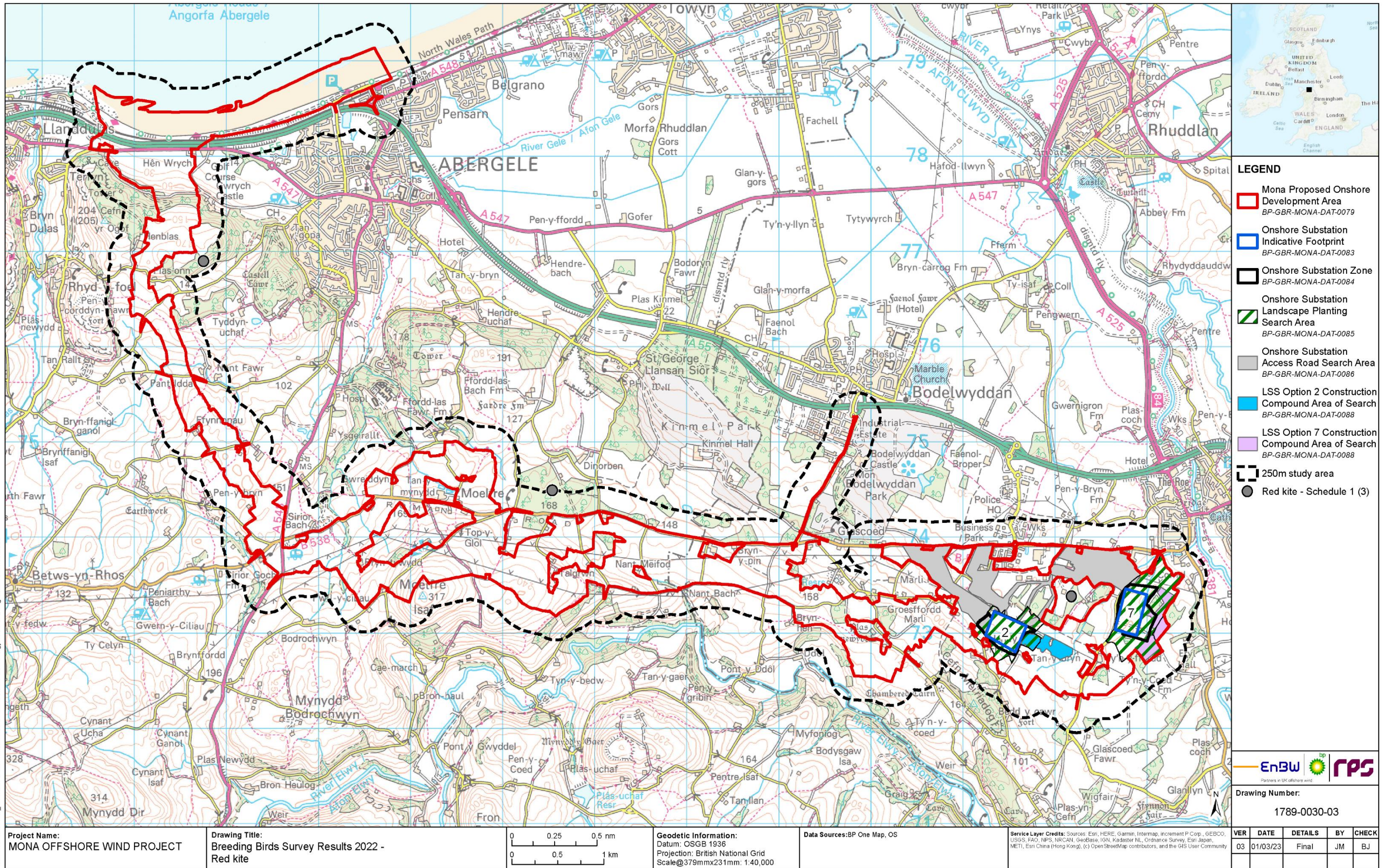


Figure 1.6: Red kite territories.

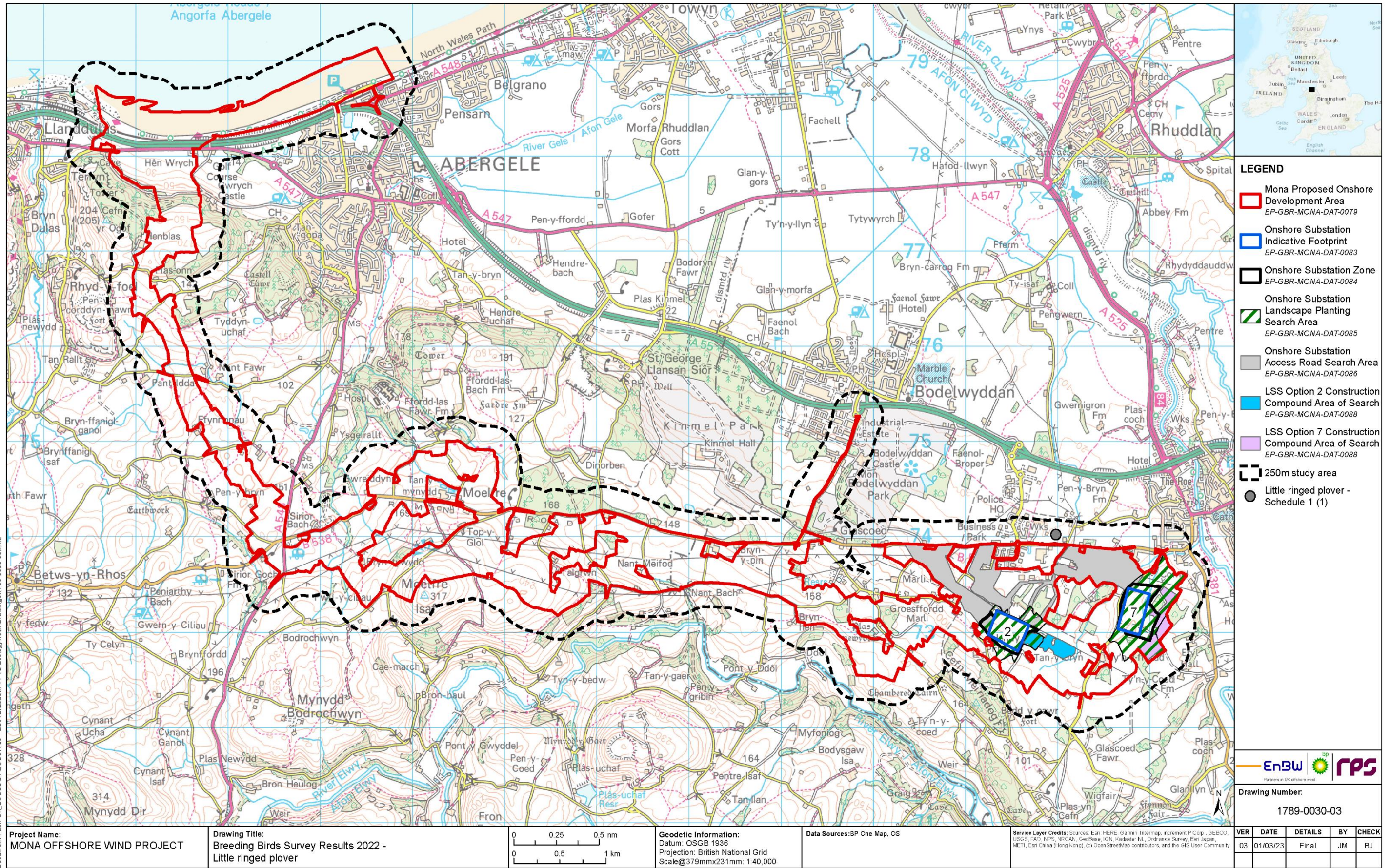


Figure 1.7: Little ringed plover territories.

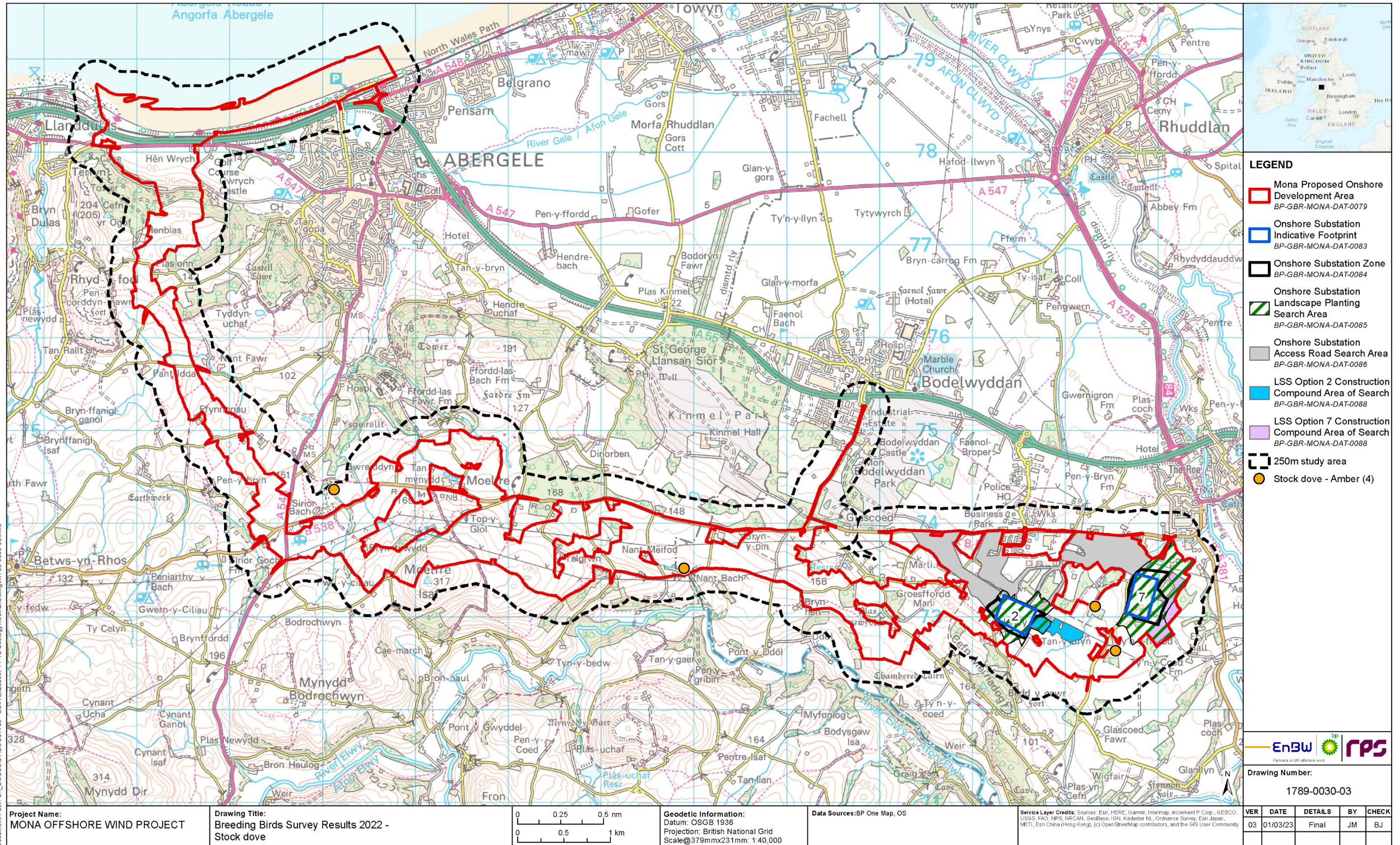


Figure 1.8: Stock dove territories.

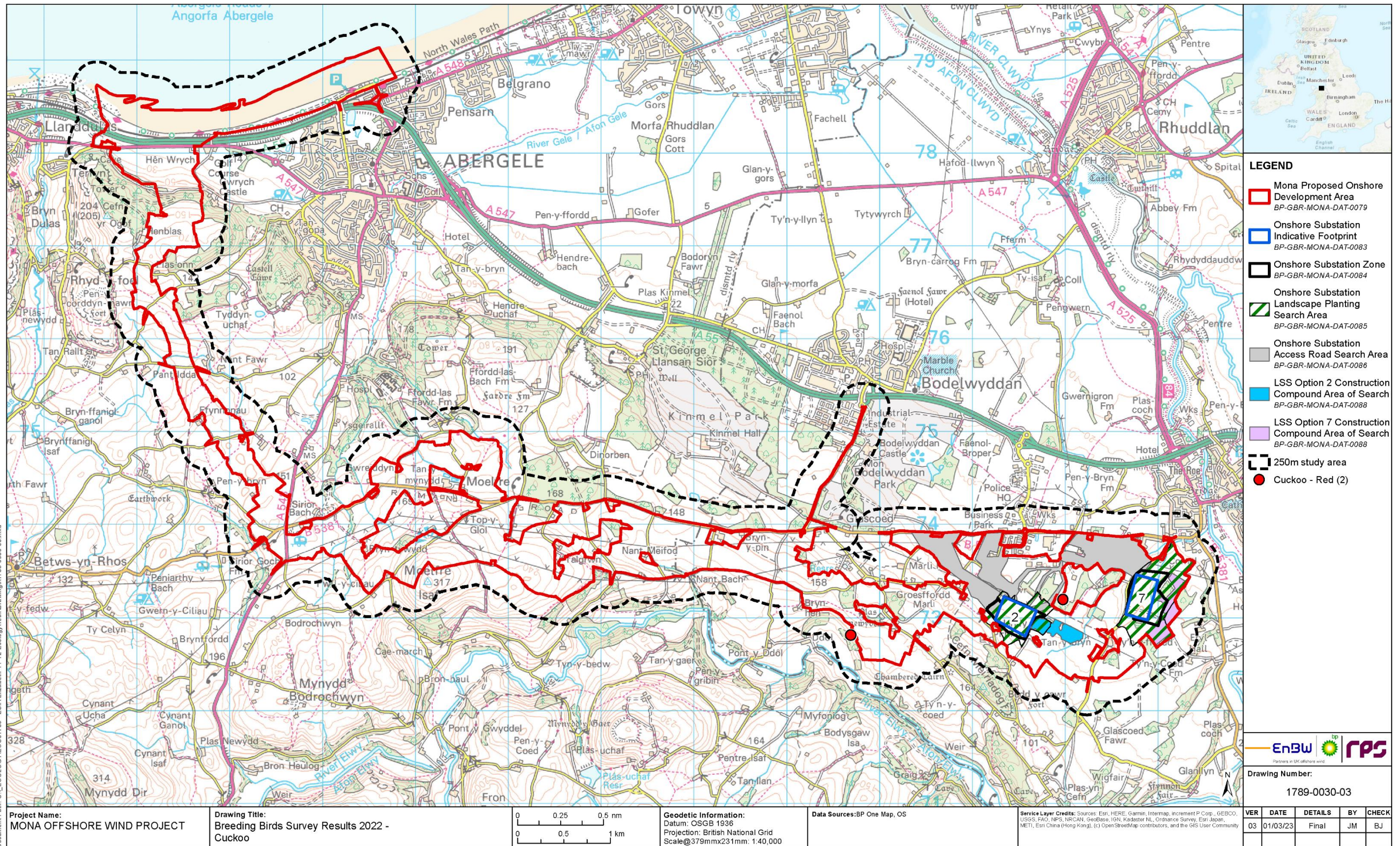


Figure 1.9: Cuckoo territories.

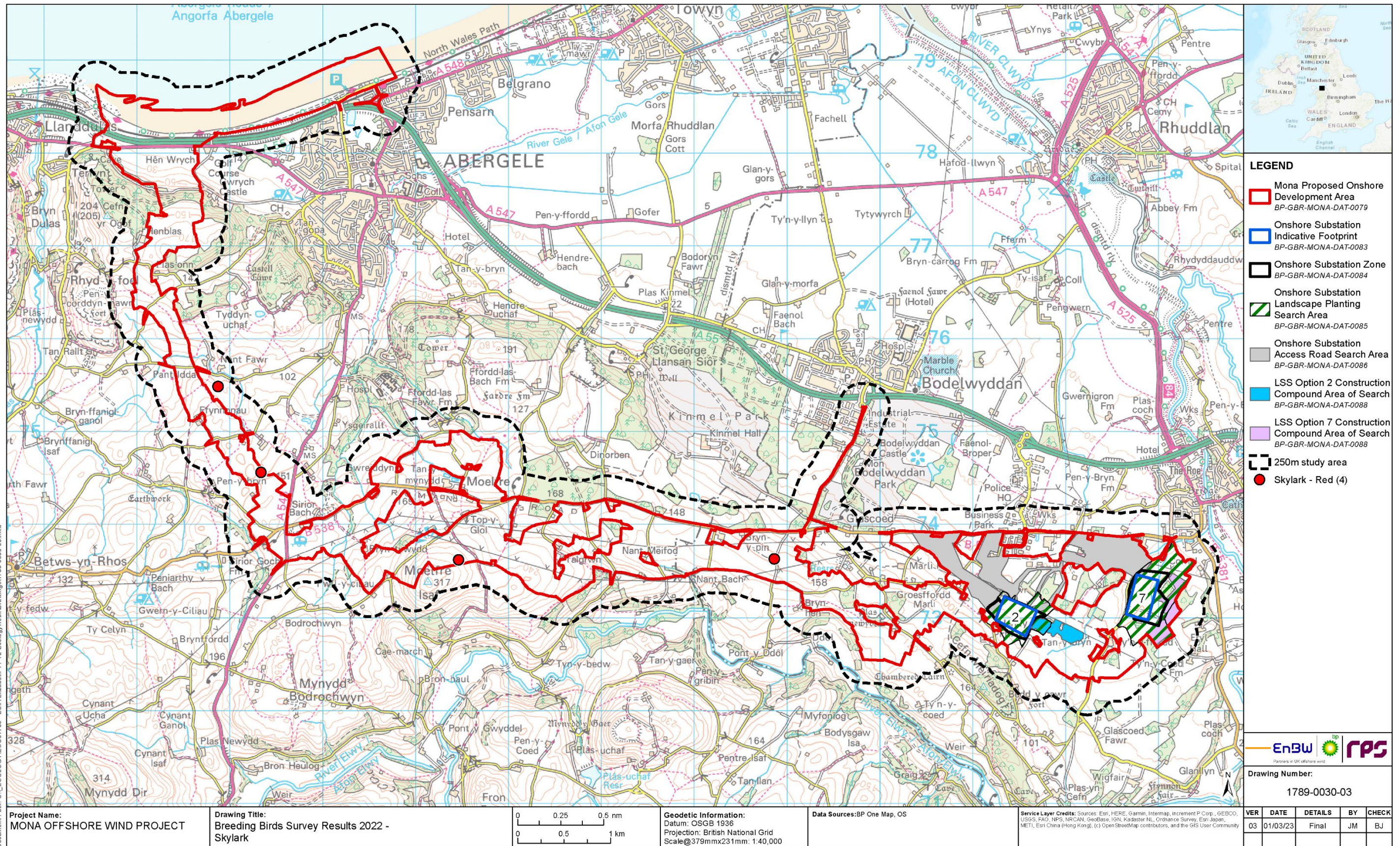


Figure 1.10: Skylark territories.

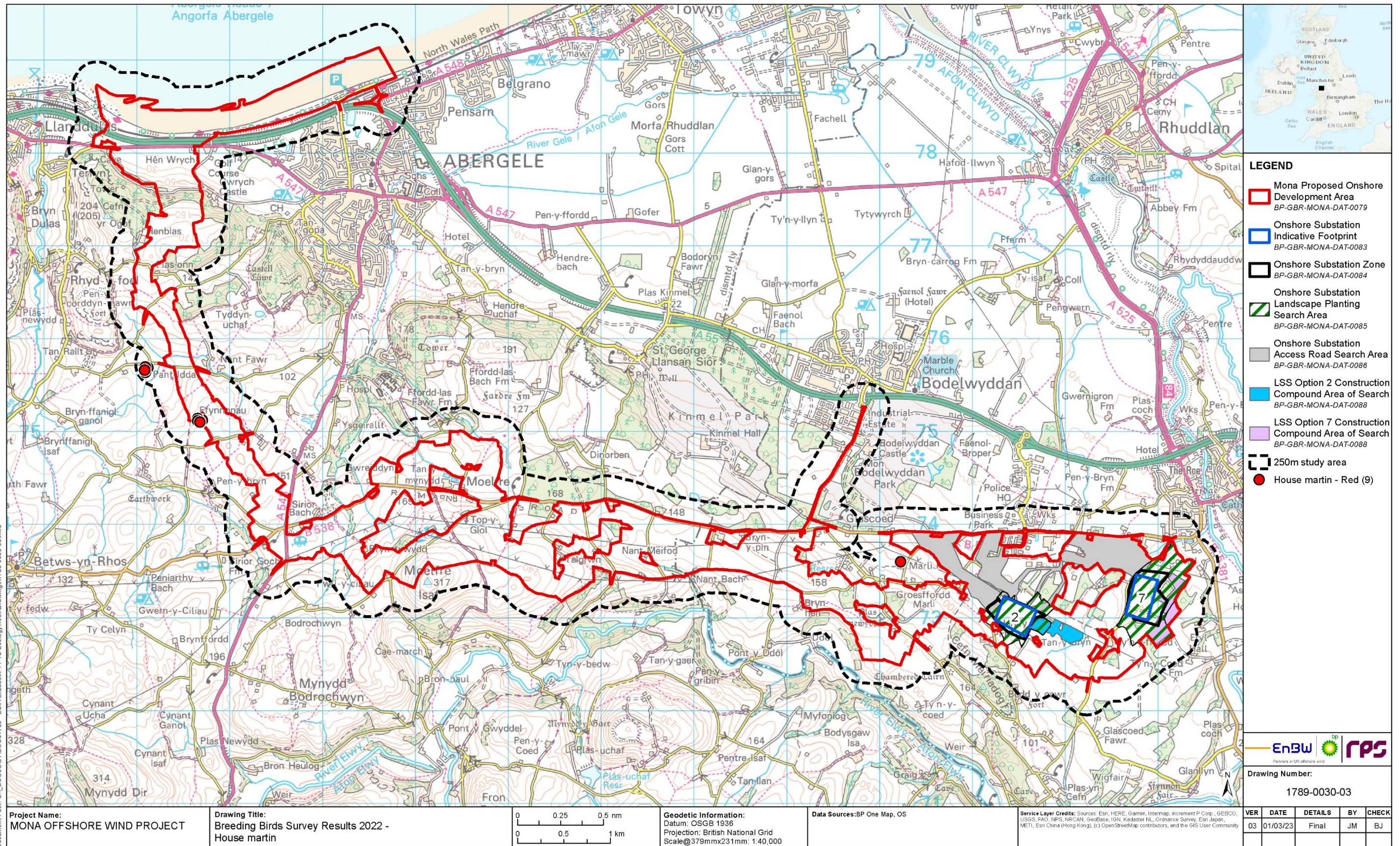


Figure 1.11: House martin territories.

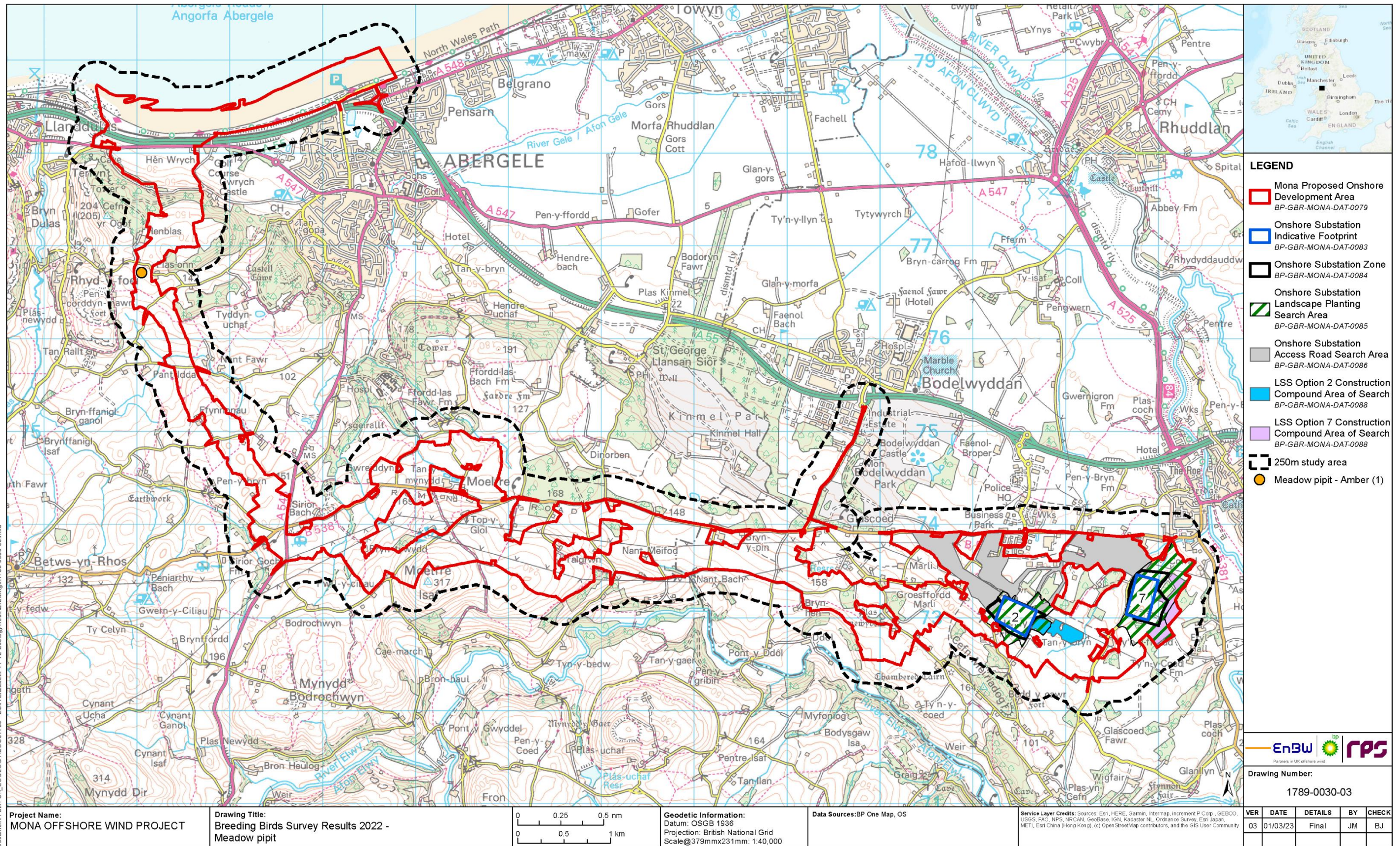


Figure 1.12: Meadow pipit territories.

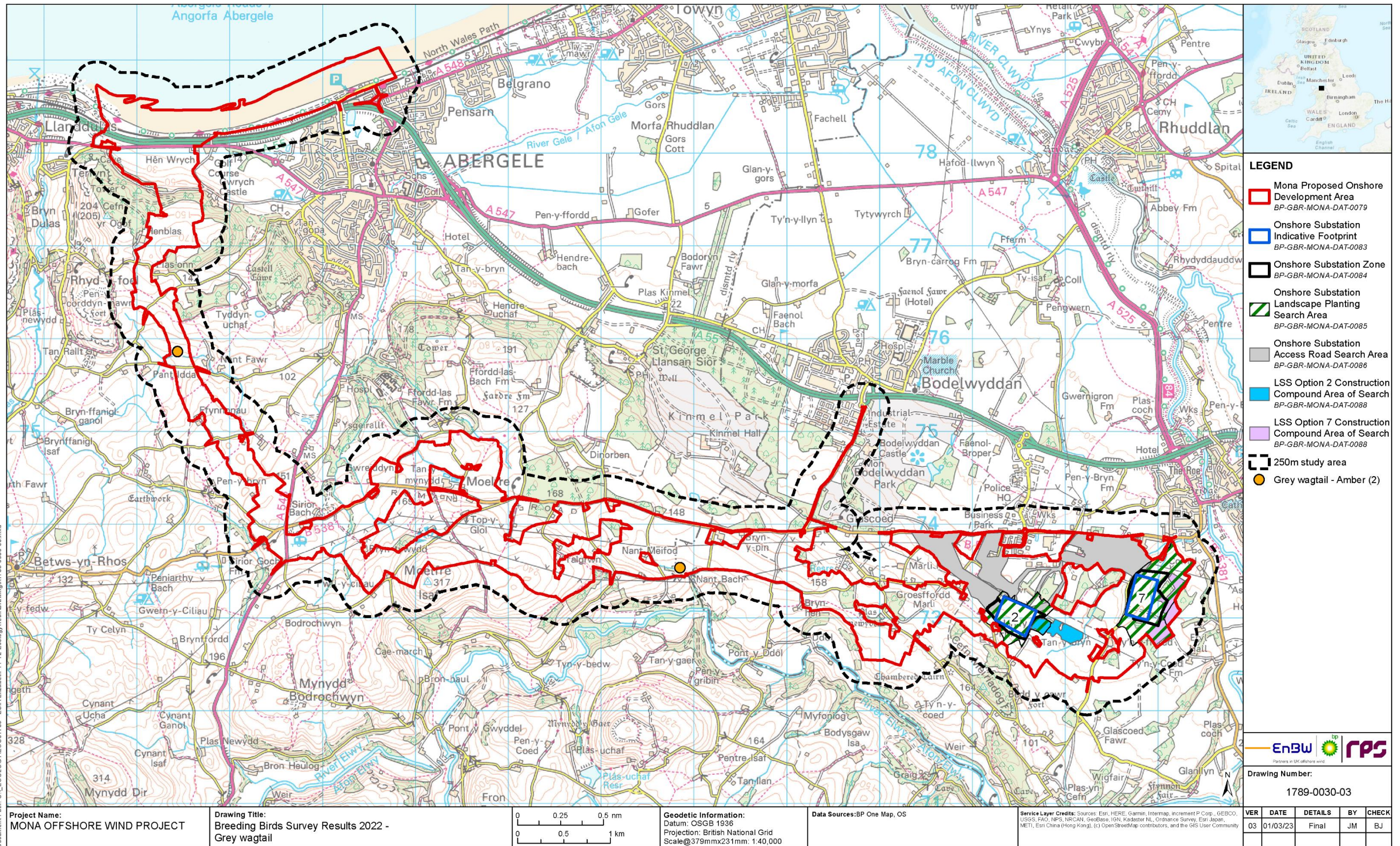


Figure 1.13: Grey wagtail territories.

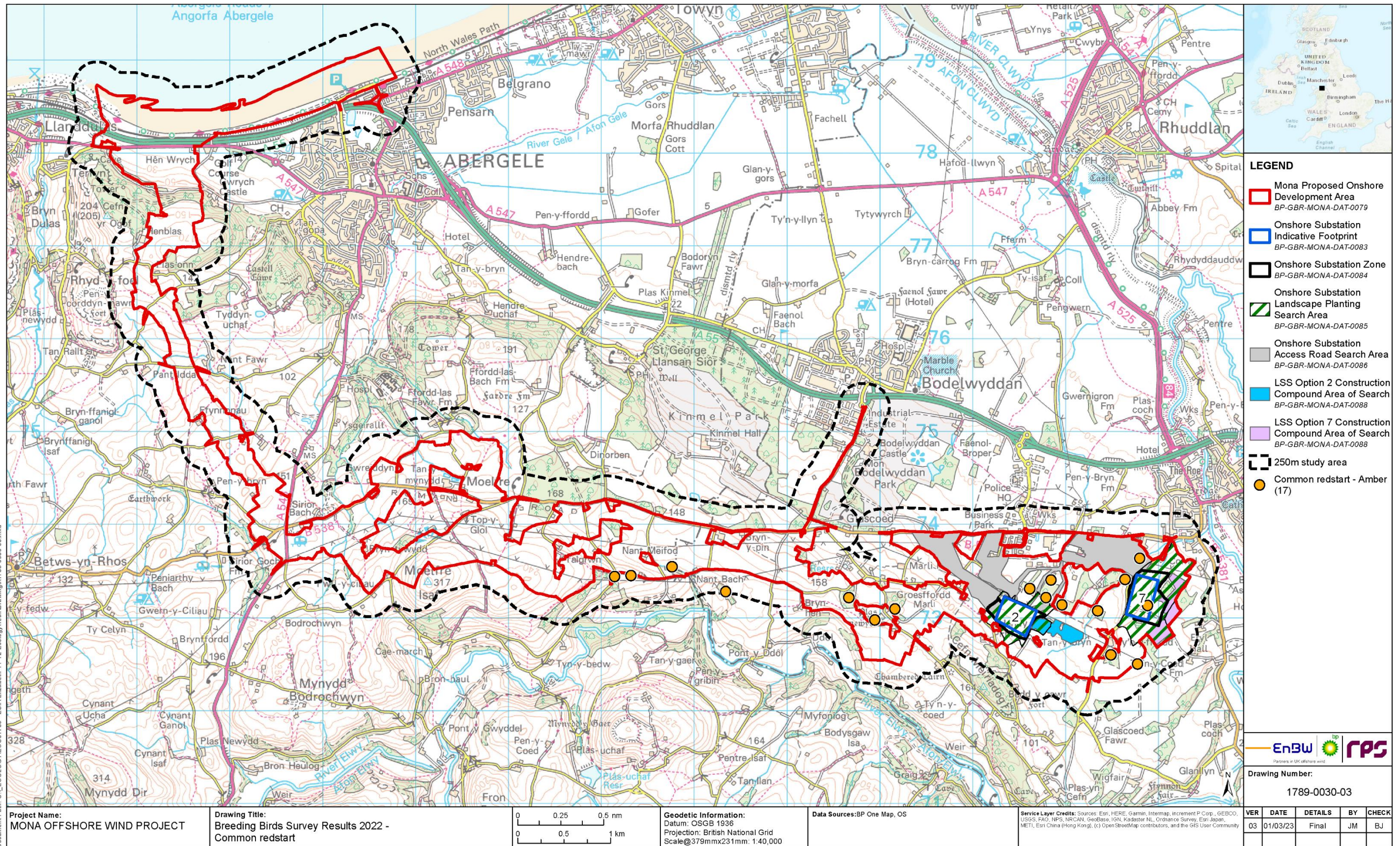


Figure 1.14: Redstart territories.

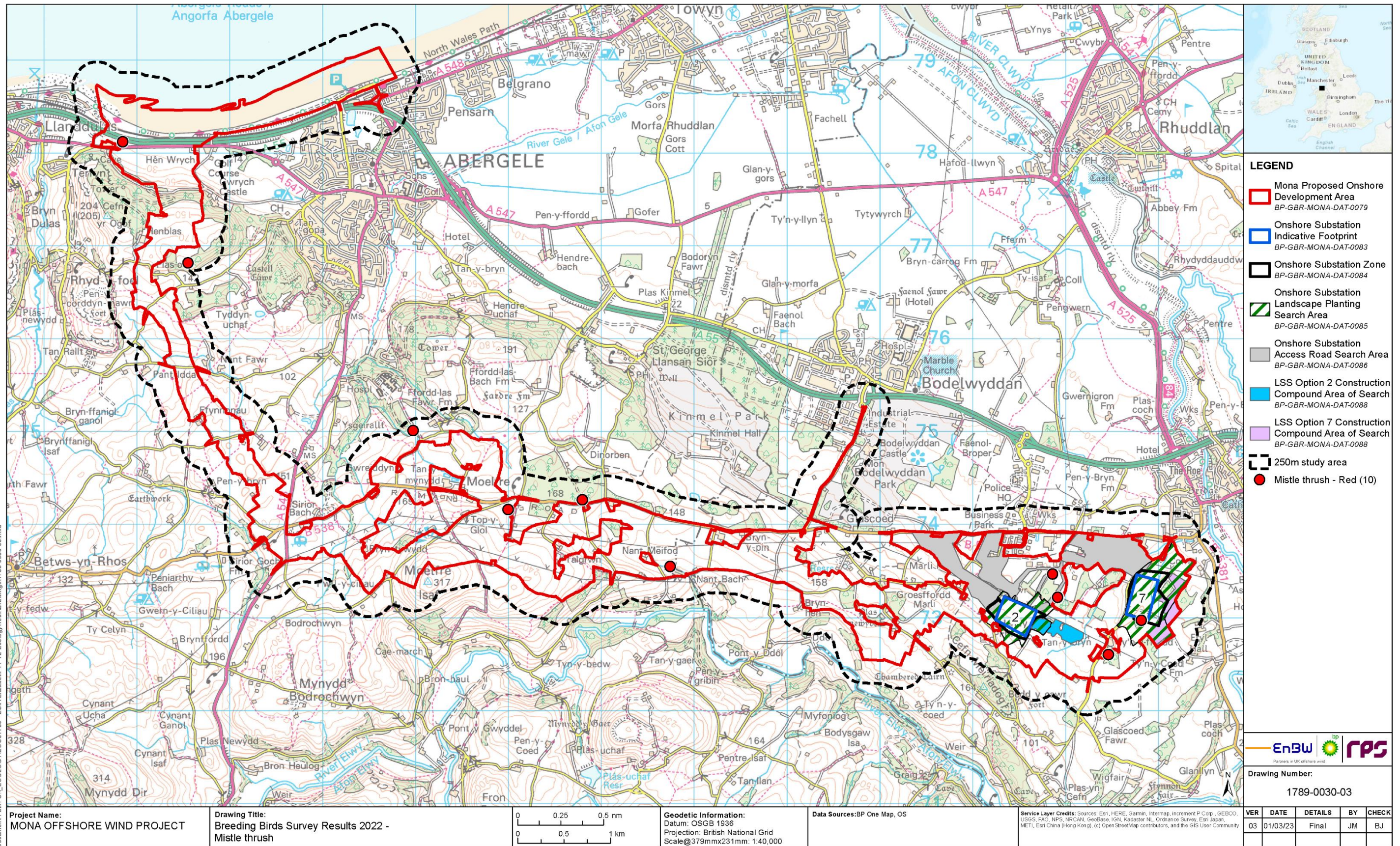


Figure 1.15: Mistle thrush territories.

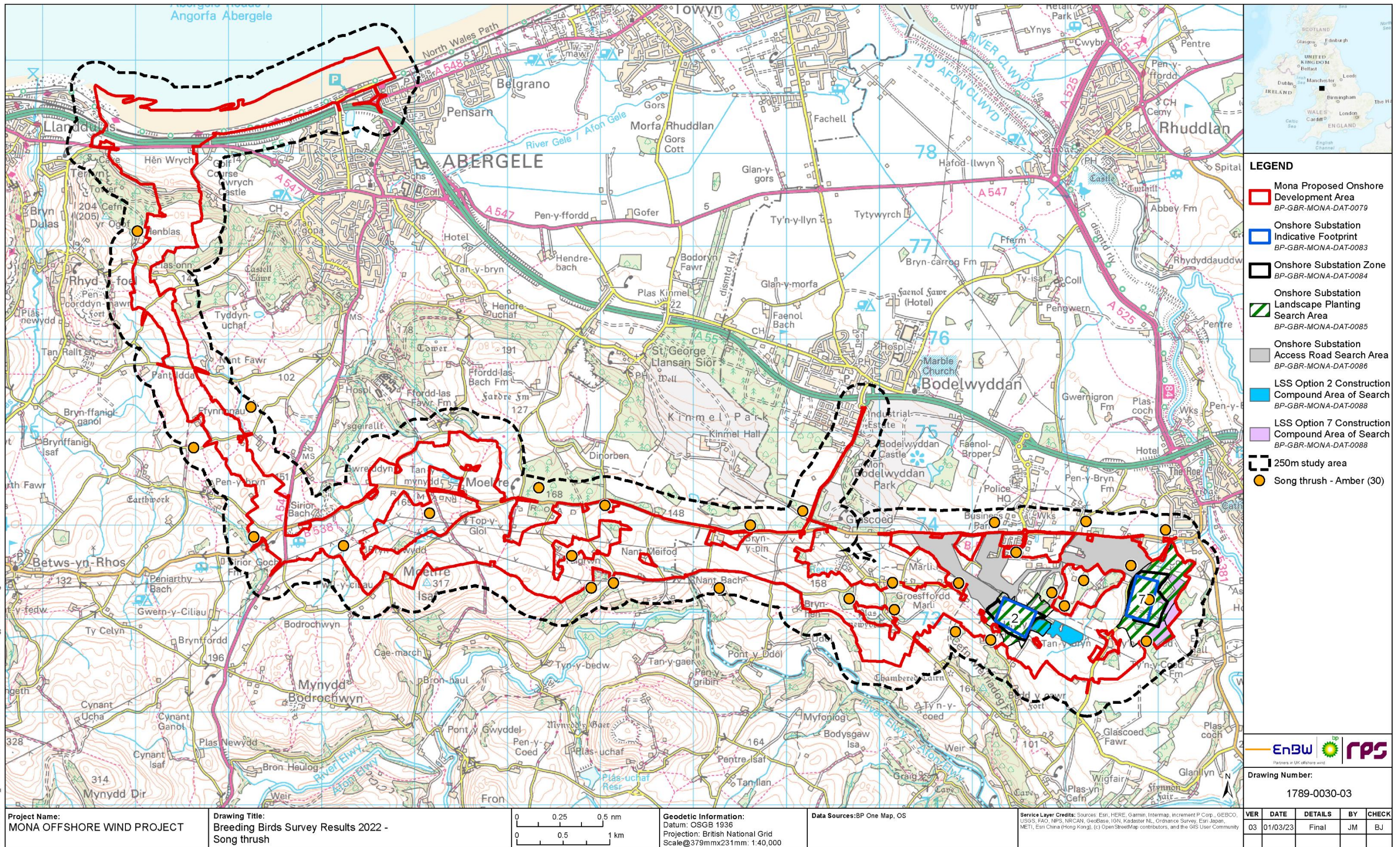


Figure 1.16: Song thrush territories.

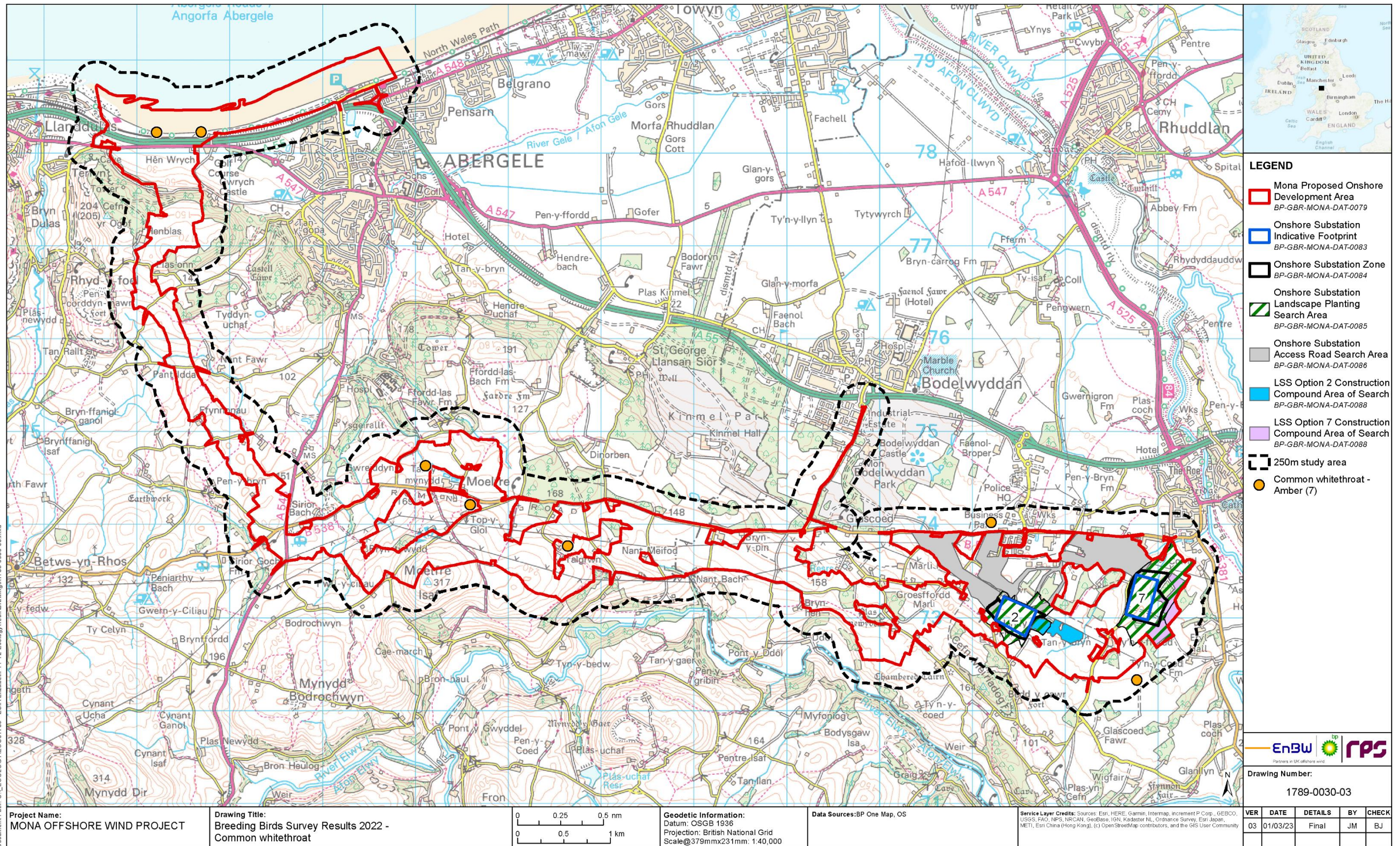


Figure 1.17: Common whitethroat territories.

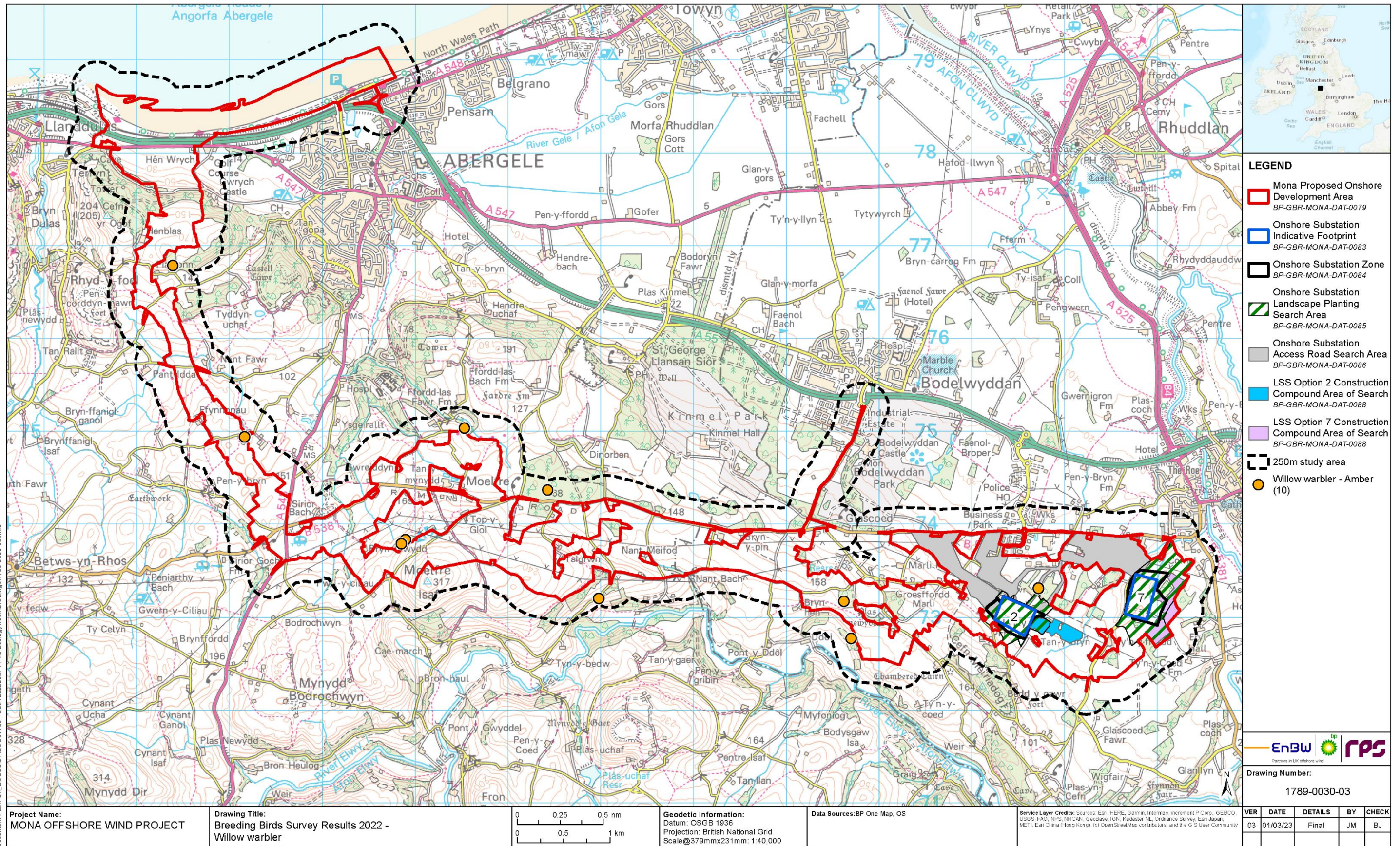


Figure 1.18: Willow warbler territories.

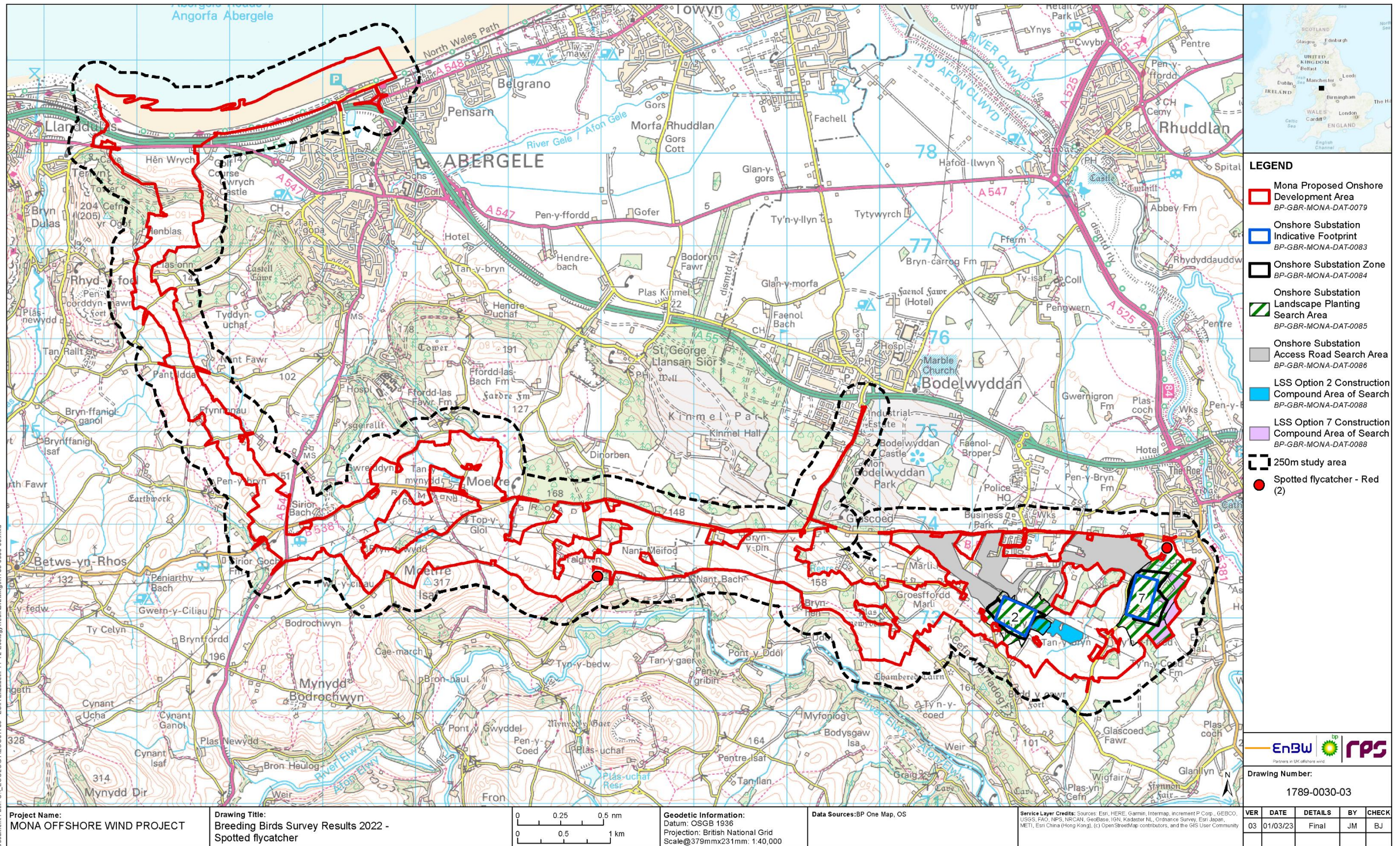


Figure 1.19: Spotted flycatcher territories.

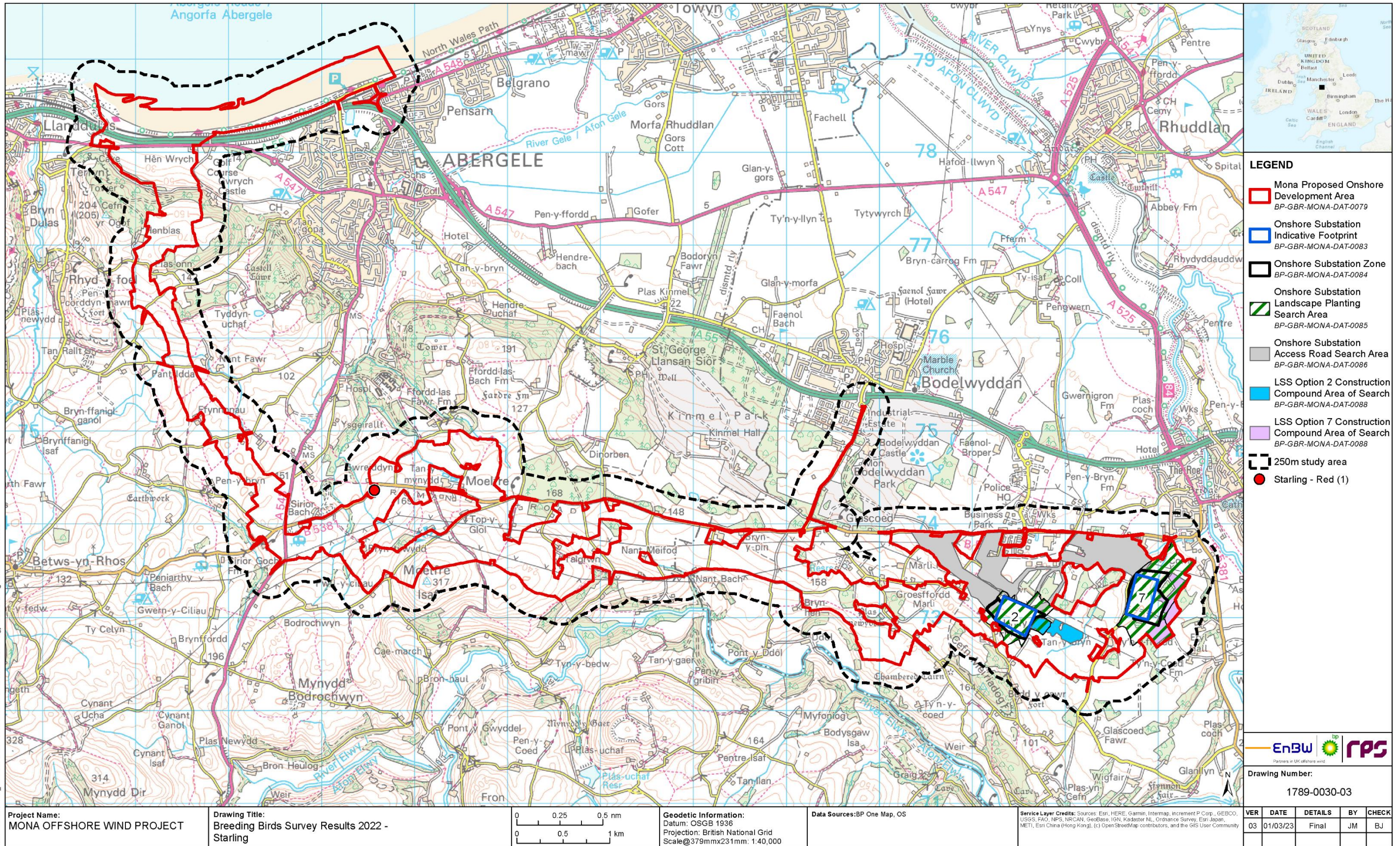


Figure 1.20: Starling territories.

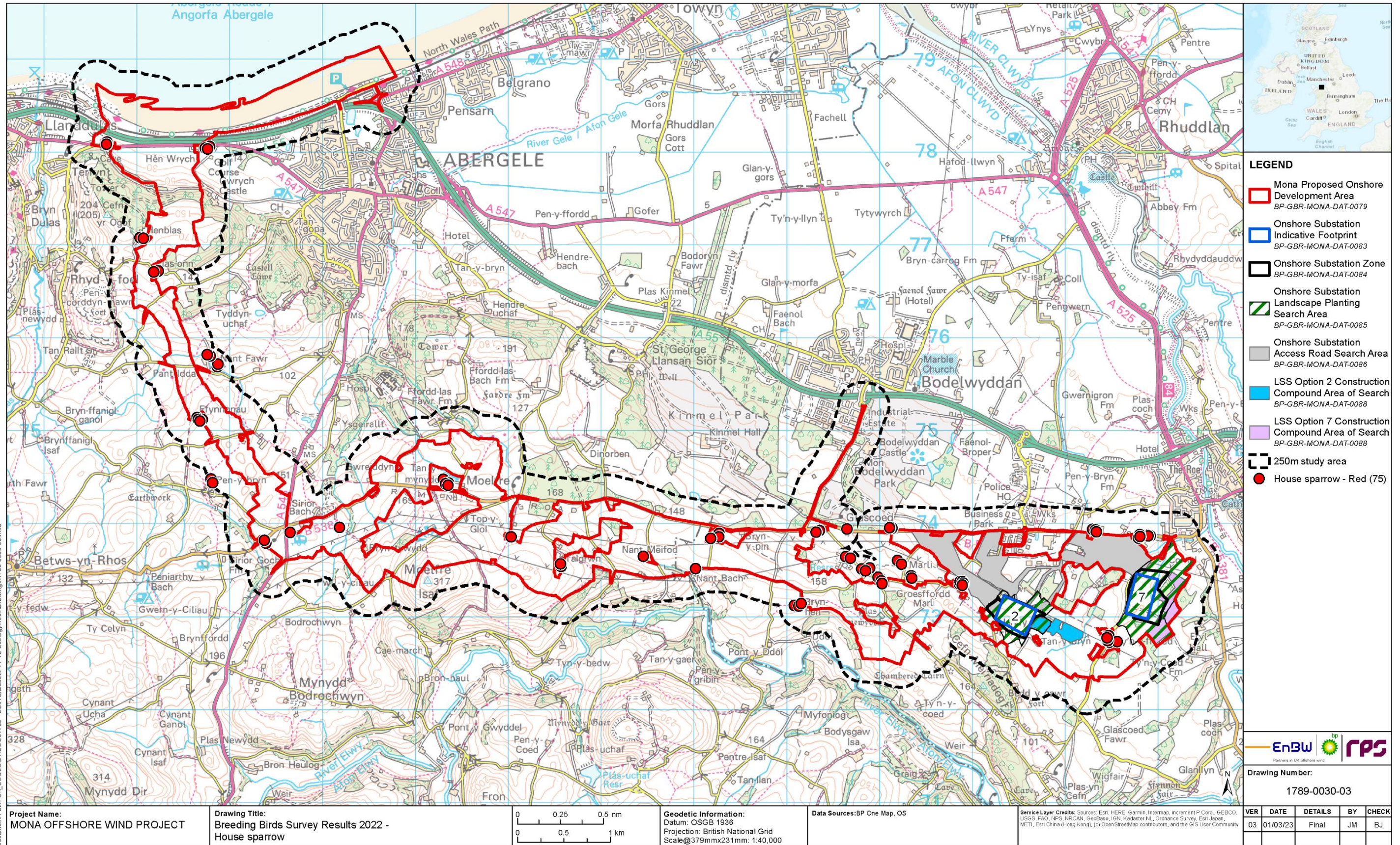


Figure 1.21: House sparrow territories.

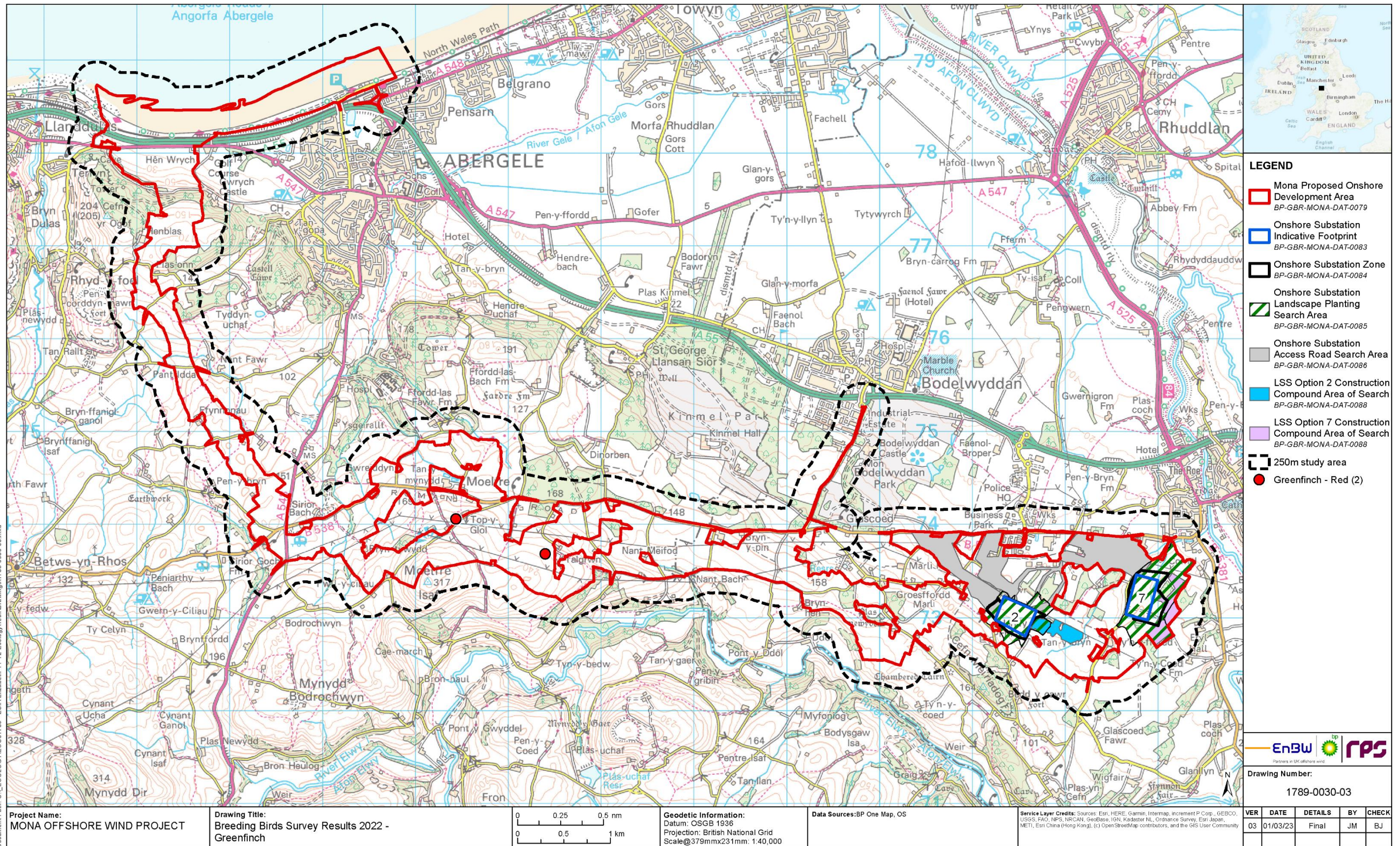


Figure 1.22: Greenfinch territories.

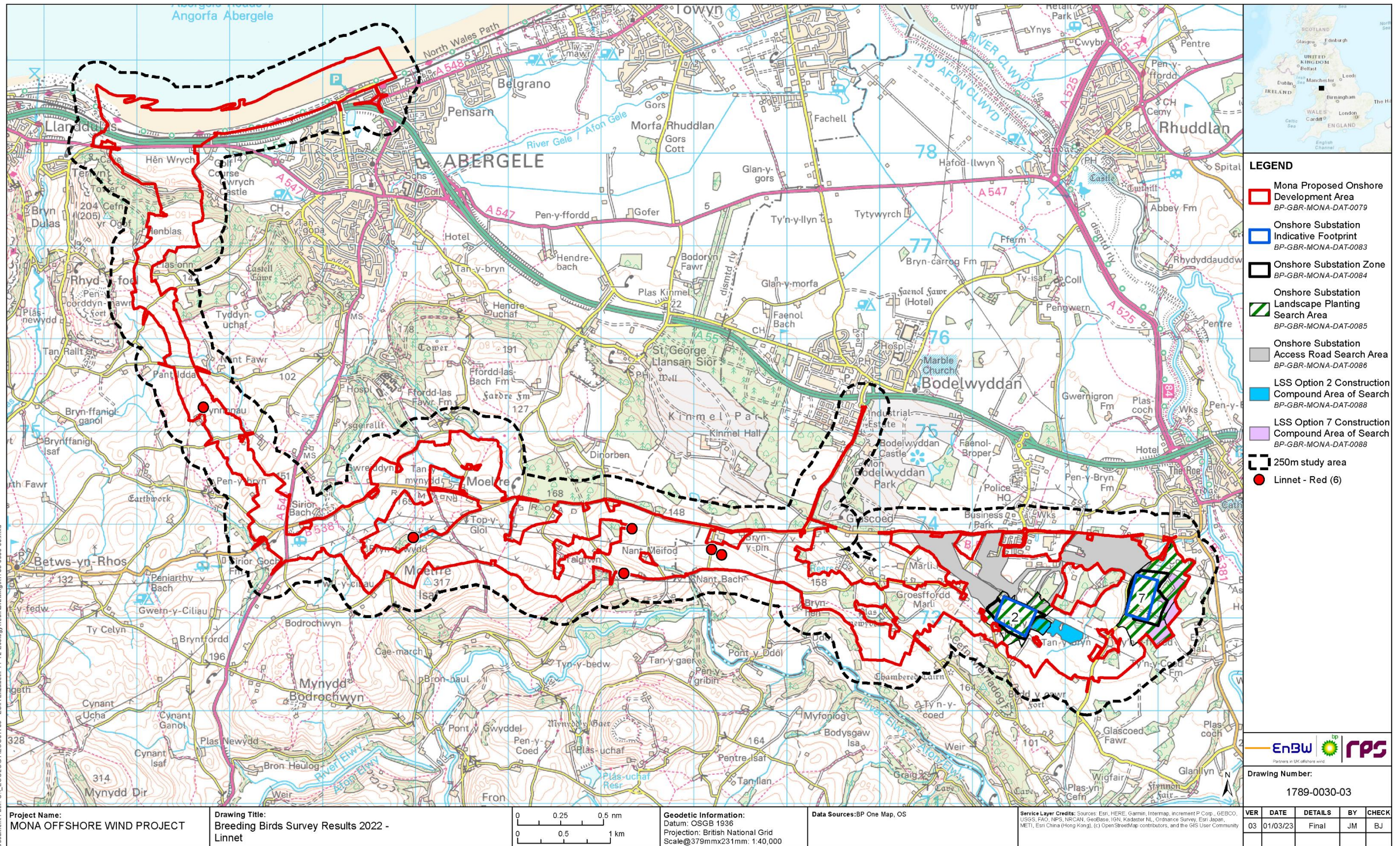


Figure 1.23: Linnets territories.

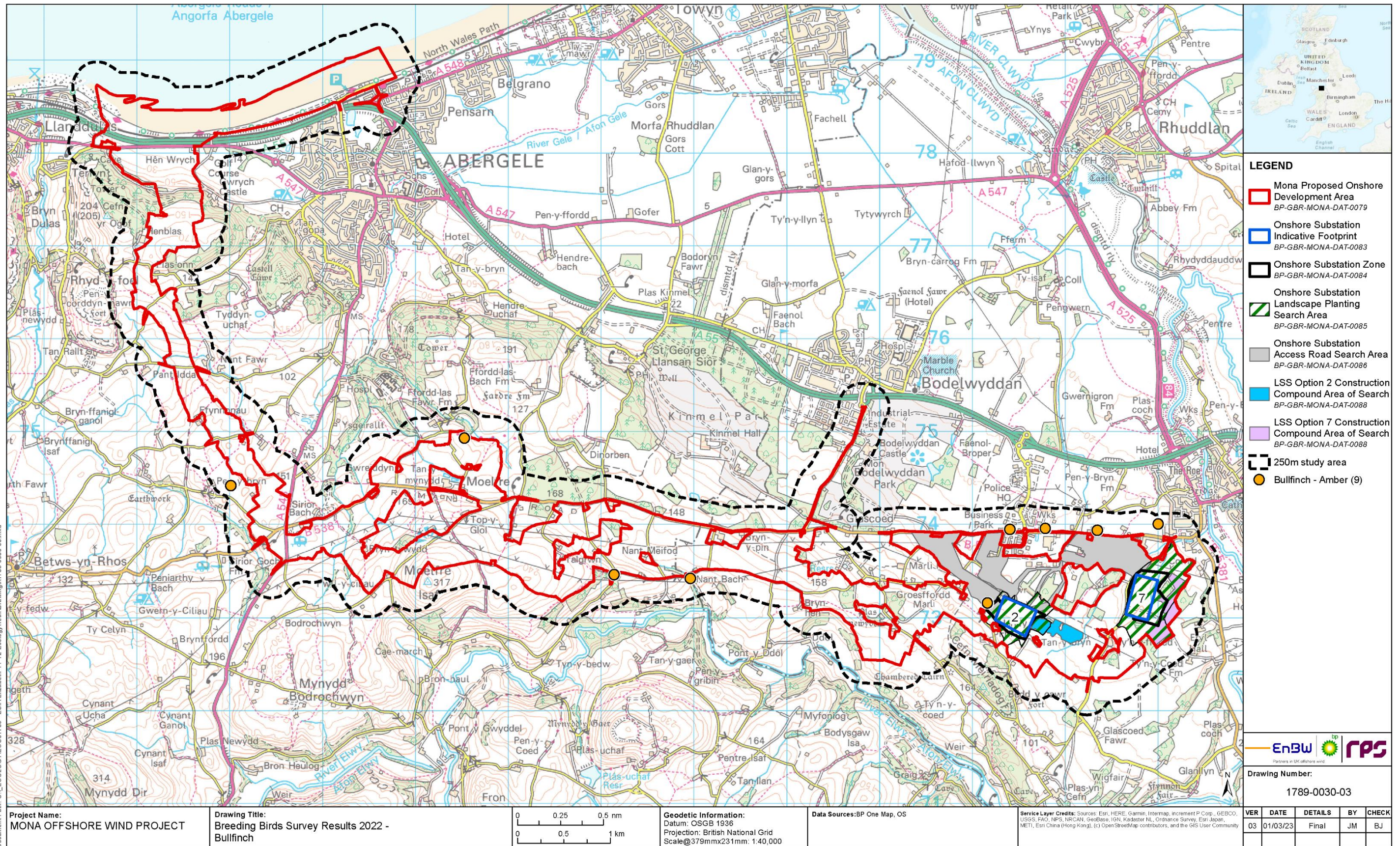


Figure 1.24: Bullfinch territories.

1.4 Summary

- 1.4.1.1 Most of the onshore ornithology breeding birds study area comprises impoverished habitat for breeding birds, dominated by sheep pasture on improved grassland and intensive arable production. In addition, small areas of woodland and hedgerows associated with field boundaries are also present within the onshore ornithology breeding birds study area.
- 1.4.1.2 Baseline data obtained as part of the desk top study and breeding bird surveys undertaken in 2022 indicate that areas of woodland and hedgerows located within the onshore ornithology breeding birds study area provide the majority of breeding bird interest.
- 1.4.1.3 A total of 47 breeding bird surveys were carried between April to July 2022 (inclusive), which used a combination of PRoW and private land for which access had been agreed.
- 1.4.1.4 The desk study and breeding bird survey results show that the breeding species present within the onshore ornithology breeding birds study area predominantly comprised widespread and common species.
- 1.4.1.5 The territory analysis concluded that 20 bird species were found to be holding territory within the onshore ornithology breeding birds study area. However, the only two species holding territory with high level legal protections under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), and which may therefore pose potential constraints to the project, were:
- Little ringed plover, where one active nest site was located on former industrial ground located approximately 500m northeast from the existing Bodelwyddan National Grid Substation.
 - Red kite, displaying possible breeding behaviour over suitable breeding habitat in three locations within the onshore ornithology breeding birds study area.
- 1.4.1.6 Therefore, based on the information provided above, it is recommended that these bird species are surveyed prior to construction of the Mona Offshore Wind Project to identify if they still pose a constraint.
- 1.4.1.7 Cofnod desk study records within the last 10 indicated the presence of barn owl, chough, crossbill, hobby, kingfisher, and peregrine within 2km of the Mona Proposed Onshore Development Area. However, none of these species were recorded during the 2022 breeding bird surveys.
- 1.4.1.8 No qualifying species listed in the citations for Dee Estuary SPA and Ramsar and Liverpool Bay SPA were recorded within the onshore ornithology breeding birds study area.
- 1.4.1.9 Given the information set out in this report, no further monitoring is recommended following construction of the Mona Offshore Wind Project.

1.5 References

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