

Natural England Commissioned Report NECR335

West Penwith Moors, Cornwall – Breeding Bird Survey 2014.

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Foreword

Natural England commission a range of reports from external contractors to provide evidence and advice to assist us in delivering our duties. The views in this report are those of the authors and do not necessarily represent those of Natural England.

Background

Since 2012, Natural England has been gathering evidence to ascertain whether land in the Penwith Moors in west Cornwall meets the published guidelines for the selection of Sites of Special Scientific Interest (SSSIs). This report is one of many commissioned by Natural England to provide the evidence required to identify those areas which should be included in an SSSI designation, to identify the features to be designated and to inform definition of the SSSI boundary. This report will also help to inform future site monitoring and to provide land management advice.

This report should be cited as:

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Natural England Project Manager - Mark Beard

Contractor - R.J.Curtis, S.Crummay and I.M.D.Maclean

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Further information

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West Penwith Moors, Cornwall – Breeding Bird Survey 2014

R.J.Curtis, S.Crummay and I.M.D.Maclean



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1. Summary

A breeding bird survey was commissioned by Natural England to support the potential notification of key areas of semi-natural habitat in the West Penwith Moors area of west Cornwall as a Site of Special Scientific Interest (SSSI).

Between March and August 2014 a team from the University of Exeter conducted a bird survey to determine the distribution and breeding status of targeted species within several 'blocks', constituting the majority of suitable lowland heathland, scrub, woodland edge or woodland-scrub and mosaics and transitions between these habitats found across the West Penwith Moors area. Each block was surveyed eight times, and during each visit the location of potential breeding sites was recorded, and a photograph taken of the habitat type utilised.

Throughout the survey, 22 species of breeding bird were recorded (within the assemblages for lowland heath, scrub, and woodland under Criterion 3.5. of the JNCC criteria for SSSI designation), culminating in over 1800 observations of potential breeding behaviour within suitable habitat. In particular, surveyed blocks supported high populations of Dartford Warbler, Cuckoo, Grasshopper Warbler, Stonechat, Linnets and Whitethroat. Smaller numbers of Nightjar, Wheatear, Raven and Quail were also recorded.

Within surveyed blocks the Dartford Warbler population exceeds 1% of the GB population (32 pairs), thus satisfying JNCC Criterion 3.1 for SSSI selection.

Furthermore, analysis suggests that the project area meets the thresholds for Criterion 3.5: Assemblages of Breeding Birds on two counts - Lowland Heath (threshold score required = 20, project area score = 21) and the combined habitats of Lowland Heath and Scrub (threshold score required = 35, project area score = 35 thus the actual score is equal to the threshold score which meets the criterion as defined).

Our results therefore suggest that the West Penwith Moors should be considered eligible for selection as a SSSI.

2. Introduction

Natural England is gathering evidence to support the potential notification of key areas of semi-natural habitat and associated features in the West Penwith Moors area of west Cornwall as a Site of Special Scientific Interest (SSSI).

To provide substantive information to underpin Natural England's biodiversity evidence base for the area, a breeding bird survey for the moorland, known locally as roughland, has been identified as an important element of evidence. Key semi-natural habitats occurring in the survey area include lowland heathland, mires and flushes, scrub and bracken. For the purposes of survey work the area had previously been divided into 57 separate numbered survey blocks, some of which are contiguous, with individual survey areas ranging in size from c.3ha to c.157ha. Some survey areas are currently under positive management while others are unmanaged.

A review of existing data relating to breeding and wintering birds was carried out in 2013 under contract to Natural England ([Crummay 2013](#)). Records and data from the British Trust for Ornithology (BTO), Cornwall Birdwatching and Preservation Society (CBWPS) and from reliable local observers was collated and assessed against the SSSI selection criteria ([Nature Conservancy Council 1989](#)). The review concluded that breeding bird assemblages for lowland heathland and / or scrub within the West Penwith Moors area may meet the criteria for notification as features of interest for the proposed SSSI.

However, these records and data were subject to a number of limitations which reduced their value for a site-based assessment.

- The degree of coverage of the area currently being considered for notification as a SSSI and the survey effort were unknown. Poor coverage and low effort may have resulted in some less abundant and / or more secretive species being overlooked.
- The relevant tetrads may have included land adjacent to habitats likely to qualify for notification, thus it was not possible to confirm that records applied solely to proposed SSSI habitats.
- It was not possible to assign records to particular habitats in the proposed SSSI which was necessary when a range of potentially suitable habitats were present.
- Although, in most cases, the data included breeding behaviour, this information was lacking for some species which means they could not be included in any breeding assemblage.

Therefore, an intensive breeding bird survey was undertaken during 2014 within selected areas across the West Penwith Moors to address the limitations of previous surveys and to determine the breeding status of targeted bird species.

The specific objectives of this work were to:

- Conduct repeated breeding bird surveys within selected survey 'blocks' (chosen by Natural England to ensure a representative sample of all habitats and mosaics that occur across West Penwith Moors), using transects and to record breeding status of assemblage species using BTO methodology.
- Provide a visual record by photographing start and stops of transect routes as well as habitat types associated with breeding locations. Photographs must be able to be geo-referenced.
- Use this information to evaluate the importance of the site's breeding bird populations and to suggest any potential management.

3. Methods

Survey area

The survey area is within the West Penwith part of the Cornwall Area of Outstanding Natural Beauty (AONB) (www.cornwall-aonb.gov.uk). It is also mainly within the former West Penwith Environmentally Sensitive Area (ESA) boundary and is focussed on areas of semi-natural habitat associated with the ESA roughland tier (see Figure 1).

The overall West Penwith Moors survey area is approximately 2,400 hectares. The breeding bird surveys covered blocks 4, 18-21, 23, 31-32, 35-36, the southern half of 37, 43-47 and 53 (see Figure 1 and Table 1). The proportion of the total area surveyed was 56.8%.

Table 1. A list of blocks surveyed and their total area.

Block number(s)	Total area (Ha)
4	86.3
18	102.63
19,20,21,23	167.49
31,32	255.11
35,36 + half of 37	288.43
43-47	397.97
53	67.5
Total	1365.43

These blocks were selected using the following criteria:

- To give a geographical spread across the West Penwith Moors area.
- To ensure the range of habitats / features present are typical of the overall area.
- To include sites known to support rare breeding species.
- To consider accessibility and survey logistics.

Field survey

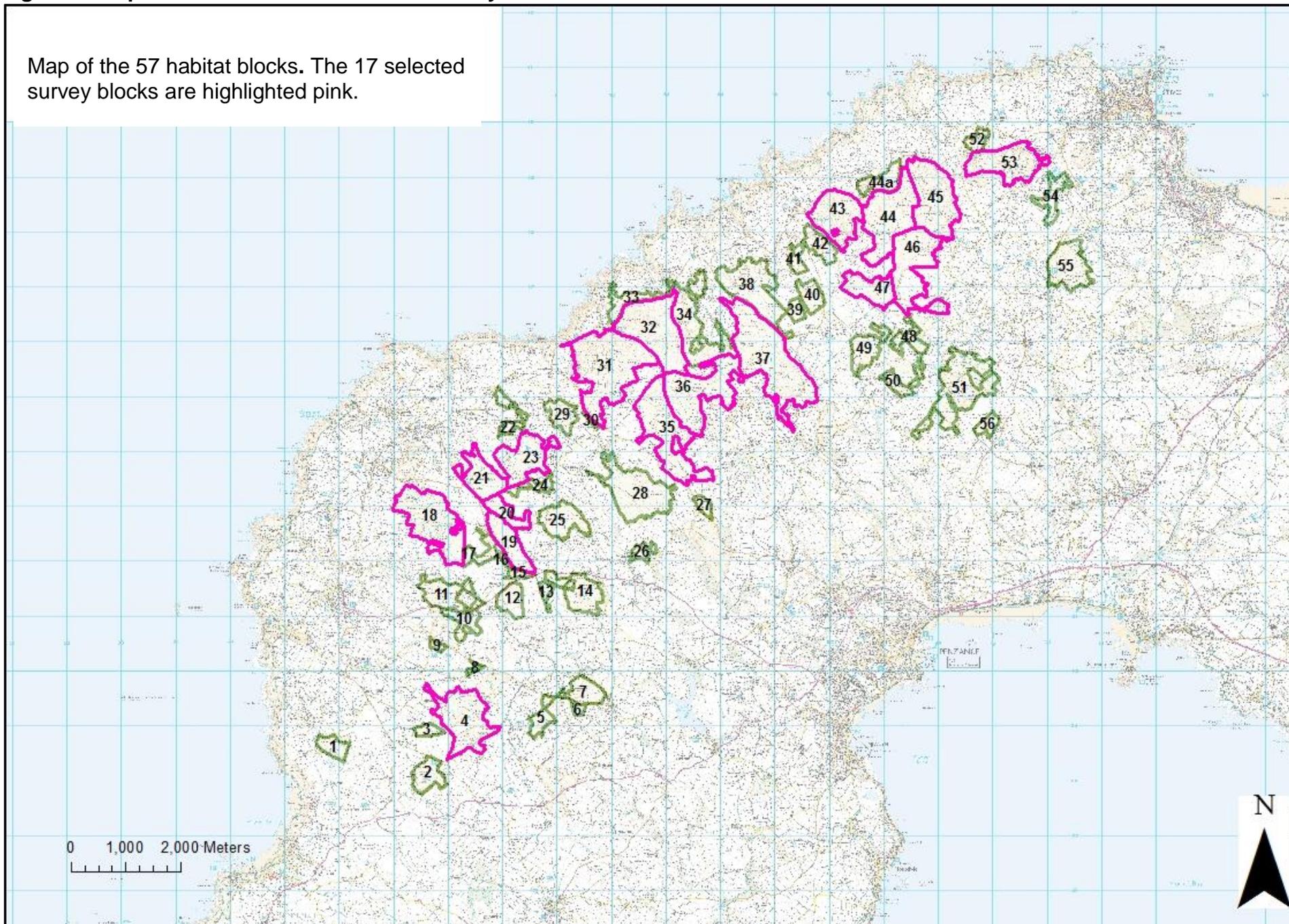
Diurnal

A variation of the Common Bird Census (CBC) methodology was adopted for recording evidence of possible, probable or confirmed breeding of species using standard BTO protocols (www.bto.org/volunteer-surveys/birdatlas/methods/breeding-evidence).

Surveys were originally intended to be conducted from late March to mid July 2014, with at least 10 days between return visits to sites. However, due to inclement weather during late March the survey start date was postponed until early April. This inevitably, had a knock on effect so that the final rounds of surveys were not completed until early August. Furthermore, three sites had only 9 days between return visits in order to finish the surveys within a suitable time frame. However, it is a reasonable assumption that the delayed start and the shortened days between return visits will not have had a significant effect on survey results.

Figure 1. Map of the West Penwith Moors survey area

Map of the 57 habitat blocks. The 17 selected survey blocks are highlighted pink.



Surveys were restricted to days with suitable weather (e.g. wind force <3, good visibility and no rain). Surveys consisted of 8 visits to each block, 7 carried out in the morning, and one in the afternoon / early evening as per the Natural England specification. Wherever possible, multiple blocks were surveyed during the morning, but the order of survey was rotated on subsequent visits to avoid bias.

Land access was not a problem on most sites. However, on blocks 4, 23, 31, 37 and 53 access was not permitted to certain parts of the site, thus observations could only be made from outside (but often overlooking) these areas.

A handheld GPS unit was used to map the locations of all targeted bird species showing exactly where the birds were holding territories, and photograph the start and end of transect routes as well as the habitat types in which breeding birds were recorded.

Throughout the survey, a total of 22 species within the breeding bird assemblages of lowland heath, scrub (excluding heath) and woodland were recorded (Table 2).

Table 2. A list of assemblage species for Lowland Heath, Scrub (excluding heath) and Woodland recorded within the survey area.

Species	Lowland Heath	Scrub	Woodland
Blackcap		X	X
Bullfinch			X
Buzzard			X
Chiffchaff			X
Coal Tit			X
Cuckoo	X	X	X
Dartford Warbler	X		
Garden Warbler		X	X
Goldcrest			X
Grasshopper Warbler	X	X	
Linnet	X	X	
Long-tailed Tit			X
Nightjar	X	X	X
Quail	X		
Raven			X
Sparrowhawk			X
Spotted Flycatcher			X
Stonechat	X	X	
Tawny Owl			X
Wheatear	X		
Whinchat	X	X	
Whitethroat		X	

Surveys focussed on assemblages of breeding bird associated with the following habitats as set out in Chapter 14 of JNCC ([2014](#)).

- lowland heathland including areas with mature gorse,
- scrub,
- woodland edge or woodland-scrub where it occurs in the survey sites, mainly willow carr associated with valley bottoms and mires,
- mosaics and transitions between the above.

Additionally, we made efforts to fully document the number of breeding pairs of Dartford Warbler, as localities that normally contain 1% or more of the total breeding population of any native species are eligible for selection as an SSSI, and Dartford Warbler being a scarce breeding species, would be likely to meet this criterion ([JNCC 2014](#)).

Nightjar

In addition to the diurnal assemblage survey visits, dusk and dawn surveys for Nightjar were also carried out. Two visits (one at dusk: 20 minutes after dusk and continuing for 1.5 hours) and one at dawn (commencing 1 hour before dawn) were undertaken in areas of suitable habitat between June and mid-July, following strict weather protocols (surveys undertaken only when wind less than force 3, and in good visibility).

4. Results

Diurnal

All blocks were surveyed the required number of times, and there were no problems accessing any sites. Although coverage of some sites was hampered by the terrain, this is unlikely to have major implications for survey results.

Each block was visited 8 times, seven morning visits and one during the evening. The breeding status of targeted bird species were recorded within each block by walking a series of transects and recording breeding locations as waypoints.

Breeding status was recorded as follows;

Possible breeder

H Species observed in breeding season in suitable nesting **Habitat**

S Singing male present (or breeding calls heard) in breeding season in suitable breeding habitat

Probable breeding

P Pair observed in suitable nesting habitat in breeding season

T Permanent **Territory** presumed through registration of territorial behaviour (song etc) on at least two different days a week or more apart at the same place or many individuals on one day

D Courtship and **Display** (judged to be in or near potential breeding habitat; be cautious with wildfowl)

N Visiting probable **Nest** site

A Agitated behaviour or anxiety calls from adults, suggesting probable presence of nest or young nearby

I Brood patch on adult examined in the hand, suggesting **Incubation**

B Nest **Building** or excavating nest-hole

Confirmed breeding

DD **Distraction-Display** or injury feigning

UN **Used Nest** or eggshells found (occupied or laid within period of survey)

FL Recently **FL**edged young (nidicolous species) or downy young (nidifugous species). Careful consideration should be given to the likely provenance of any fledged juvenile capable of significant geographical movement. Evidence of dependency on adults (e.g. feeding) is helpful. Be cautious, even if the record comes from suitable habitat.

ON Adults entering or leaving nest-site in circumstances indicating **Occupied Nest** (including high nests or nest holes, the contents of which can not be seen) or adults seen incubating

FF Adult carrying **Faecal sac** or **Food** for young

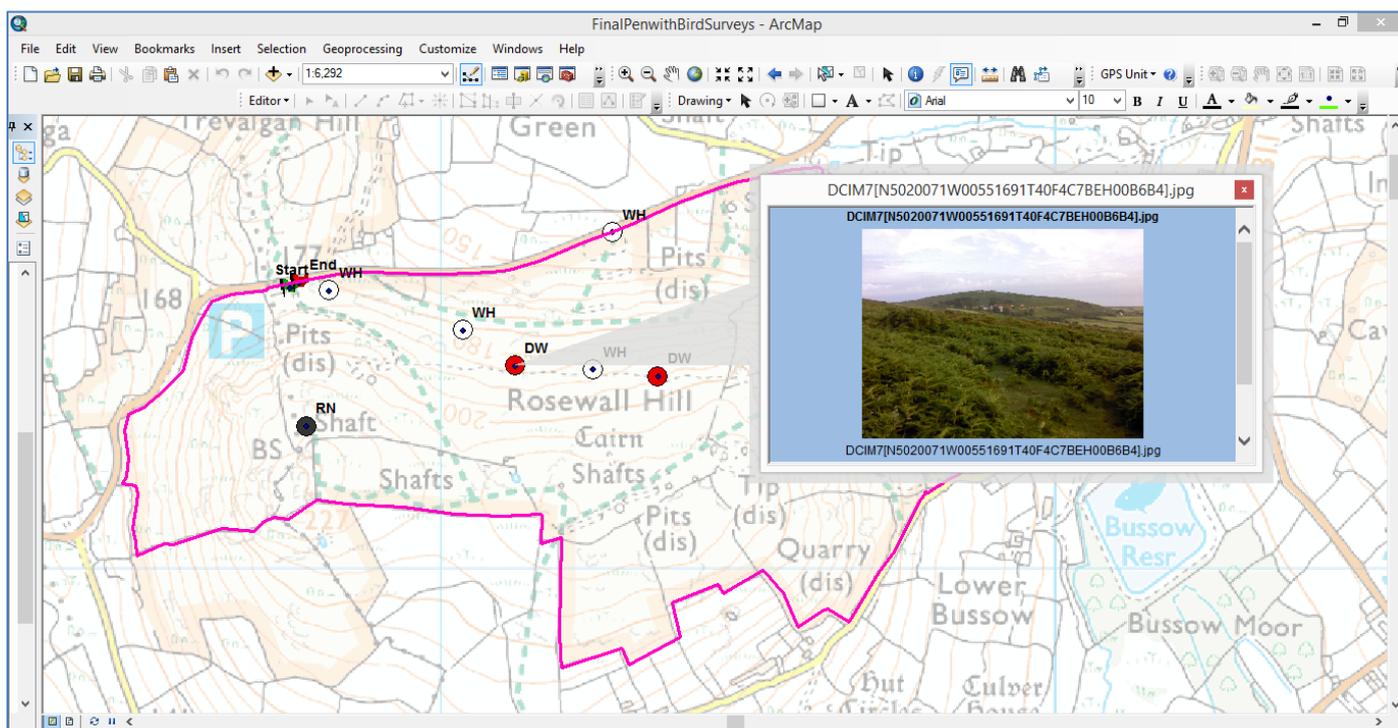
NE Nest containing **Eggs**

NY Nest with **Young** seen or heard

The number of territories for each species within each block was estimated according to standard BTO protocols as the number of likely probable or confirmed breeding pairs.

Geo-referenced photographs were taken at start and stops of transect routes as well as habitat types associated with breeding locations. Photographs can be viewed easily within the ArcMap data (using the HTML popup on the main toolbar), which is provided as a supplementary database.

Figure 2. An example of a geo-referenced photograph of Dartford Warbler breeding habitat at Rosewall Hill (double clicking the photograph will enlarge it).



Survey results are produced as a series of tables showing estimated number of territories for each assemblage species within each block. Maps for each block showing the location of bird territories are provided in the Appendix.

Summary of diurnal field surveys

Table 3. Summary of probable and confirmed Lowland Heath breeding assemblage species across survey blocks

Species	BTO Code	Block Number and Breeding Status (Probable or Confirmed)																												Estimated Number of Territories						
		4		18		19		20		21		23		31		32		35		36		37		43		44		45			46		47		53	
		P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C		P	C	P	C		
Cuckoo	CK	2		3		2		2		2		2	1	2		2		1	1	2		1		2		2		2		3		2		2		36
Dartford Warbler	DW		2	2	1						2	2	2		4	3	4	4	2	2	1		1	2		5	3	8	4		1			2		55
Grasshopper Warbler	GH	2	1	3		1		1		2		2		5	3	3	2	8	3	2	3	4	3	1		6		6		2						63
Linnet	LI	6	1	6	3	1	5	1	3		4	2	3	3	5	2	5	2	5	2	10	7	5		1	7	2	4	3	1	4	6	1	9	1	120
Nightjar	NJ													2		3																3		8		
Quail	Q.													1																				1		
Stonechat	SC		7	3	6		7	2	7		8		4		9	1	8		9	2	14	4				2	7		3	1	9		7	1	3	124
Wheatear	W.	1		1		2		2		2		2		1		2																1		14		

Table 4. Summary of probable and confirmed Scrub breeding assemblage species across survey blocks

Species	BTO Code	Block Number and Breeding Status (Probable or Confirmed)																												Estimated Number of Territories						
		4		18		19		20		21		23		31		32		35		36		37		43		44		45			46		47		53	
		P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C		P	C	P	C	P	C
Blackcap	BC							1											1				2			2		1				4		11		
Cuckoo	CK	2		3		2		2		2		2	1	2		2		1	1	2		1		2		2		3		2		2		36		
Garden Warbler	GW																			1														1		
Grasshopper Warbler	GH	2	1	3		1		1		2		2		5	3	3	2	8	3	2	3	4	3	1		6		6		2						63
Linnet	LI	6	1	6	3	1	5	1	3		4	2	3	3	5	2	5	2	5	2	10	7	5		1	7	2	4	3	1	4	6	1	9	1	120
Nightjar	NJ													2		3																3		8		
Stonechat	SC		7	3	6		7	2	7		8		4		9	1	8		9	2	14	4				2	7		3	1	9		7	1	3	124
Whitethroat	WH	6	3	5	2	2	1	2	1		9		6		19	4	19	4	18	11	7	9	5	17	3	15	3	27	2	4		10	2	15		231

Table 5. Summary of probable and confirmed Woodland breeding assemblage species across survey blocks

Species	BTO Code	Block Number and Breeding Status (Probable or Confirmed)																				Estimated Number of Territories														
		4		18		19		20		21		23		31		32		35		36			37		43		44		45		46		47		53	
		P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C		P	C	P	C	P	C	P	C	P	C	P	C		
Blackcap	BC						1												1					2				2		1				4		
Bullfinch	BF																					2		1										2		
Buzzard	BZ				1													1			1															
Chiffchaff	CC	2							1			1		2	1	3	1	1	3		4	5				1							6			
Coal Tit	CT																		1																	
Cuckoo	CK	2		3		2		2		2		2		2	1	2		2		1	1	2		1		2		2		3		2		2		
Garden Warbler	GW																				1															
Goldcrest	GC																					1														
Long-tailed Tit	LT																			1																
Nightjar	NJ											2		3																			3			
Raven	RN					1		1							1	1																		1		
Spotted Flycatcher	SF															1																				
Tawny Owl	TO																		1																	

Assessment against JNCC Criterion 3.5

Criterion descriptor

Localities are eligible which support an especially good range of bird species characteristic of the habitat, as defined by a 'BTO index' equal to or exceeding the value for the appropriate habitat type. To qualify under guideline 3.5, the index value for a site should equal or exceed the threshold value given for the relevant habitat. A species may be included if it has been recorded as probably or confirmed breeding ([Conway et al. 2007](#)).

For most habitats, a site reaching half the theoretical maximum would be an especially good example of the breeding bird community. Thus it is this half-maximum value which is the threshold given for each habitat.

Table 6. The species recorded during surveys associated with Lowland Heath habitats and their relevant threshold scores.

Lowland heath

Quail	5
Cuckoo	2
Nightjar	3
Stonechat	2
Wheatear	2
Grasshopper Warbler	2
Dartford Warbler	4
Linnet	1
Total	21

The threshold site-index value for Lowland Heath is 20, so the recorded breeding bird assemblage exceeds this threshold score.

Table 7. The species recorded during surveys associated with Scrub (excluding heath) habitats and their relevant threshold scores.

Scrub (excluding heath)

Cuckoo	2
Nightjar	3
Stonechat	2
Grasshopper Warbler	2
Whitethroat	2
Garden Warbler	1
Blackcap	1
Linnet	1
Total	14

The threshold site-index value for Scrub is 15, so the recorded breeding bird assemblage fails to meet this threshold score.

Table 8. The species recorded during surveys associated with combined Lowland Heath and Scrub habitats and their relevant threshold scores (note that the species scores double if they are recorded in both habitats).

Combined Heath and Scrub (excluding heath)

Quail	5
Cuckoo	4
Nightjar	6
Stonechat	4
Wheatear	2
Grasshopper Warbler	4
Dartford Warbler	4
Linnet	2
Whitethroat	2
Garden Warbler	1
Blackcap	1
Total	35

The threshold site-index value for combined Lowland Heath and Scrub is 35, so the recorded breeding bird assemblage equals the threshold score which meets the criterion.

Table 9. The species recorded during surveys associated with Woodland habitats and their relevant threshold scores.

Woodland

Garden warbler	1
Blackcap	1
Chiffchaff	1
Goldcrest	1
Buzzard	3
Spotted flycatcher	1
Long-tailed tit	1
Cuckoo	2
Coal tit	1
Tawny owl	2
Nightjar	3
Raven	3
Bullfinch	1
Total	21

The threshold site-index value for Woodland is 39, so the recorded breeding bird assemblage fails to meet this threshold score.

Site performance against criterion

The project area meets the threshold for Criterion 3.5: Assemblages of Breeding Birds on two counts - Lowland Heath (threshold score required = 20, project area score = 21) and the combined habitats of Lowland Heath and Scrub (threshold score required = 35, project area score = 35), thus the actual score is equal to the threshold score which meets the criterion as defined.

Assessment against JNCC Criterion 3.1

Criterion descriptor

Localities which normally contain 1% or more of the total British breeding population of any native species and seabird colonies of over 10,000 breeding pairs are eligible for selection. In practice, this guideline covers mainly colonial species (e.g. seabirds and herons), semi-colonial species (e.g. some grebes, ducks and waders) and rare species.

Threshold populations

Population estimates of the British breeding population of Dartford Warbler and Nightjar are given in Musgrove et al. (2013) provided below:

Species	GB pop. estimate (Musgrove et al. 2013)	1% Threshold (Musgrove et al. 2013)
Dartford Warbler	3,200 pairs	32 pairs
Nightjar	4,600 males	46 pairs

Dartford Warbler

During the 8 survey visits, every effort was taken to locate breeding pairs of Dartford Warbler ([JNCC 2014](#)). While singing single males are conspicuous early in the spring, paired birds are incredibly elusive, only becoming vocal and aggressive once fledglings are close to leaving or have left the nest in late June and early July, and so later surveys are the most accurate time to gauge number of breeding pairs. Thus confirmation of breeding is difficult and likely to be an underestimate of the total population size. Furthermore, many Dartford Warblers were recorded as 'probable' as opposed to 'confirmed'. Nevertheless, both surveyors were surprised how many pairs occurred across the survey sites, and we estimate there to be the following number of pairs on each block (Table 10).

Table 10. Estimated number of breeding pairs of Dartford Warbler in each block

Block No.	Estimated number of pairs
4	2
18	3
19	
20	
21	
23	4
31	4
32	7
35	6
36	3
37	1
43	2
44	8
45	12
46	1
47	
53	2
Total	55

Site performance against criterion

A total of 55 probable or confirmed breeding pairs of Dartford Warbler were recorded across 13 survey blocks (Figures 3 and 4), exceeding 1% of the UK threshold figure of 32 pairs to satisfy JNCC Criterion 3.1.

Additionally, given that the area surveyed was 56% of the total West Penwith survey area, and examining the geographical spread of territories (Figures 3 and 4), it is highly likely that other blocks will contain breeding populations.

Figure 3. Distribution of blocks containing breeding Dartford Warblers across West Penwith Moors

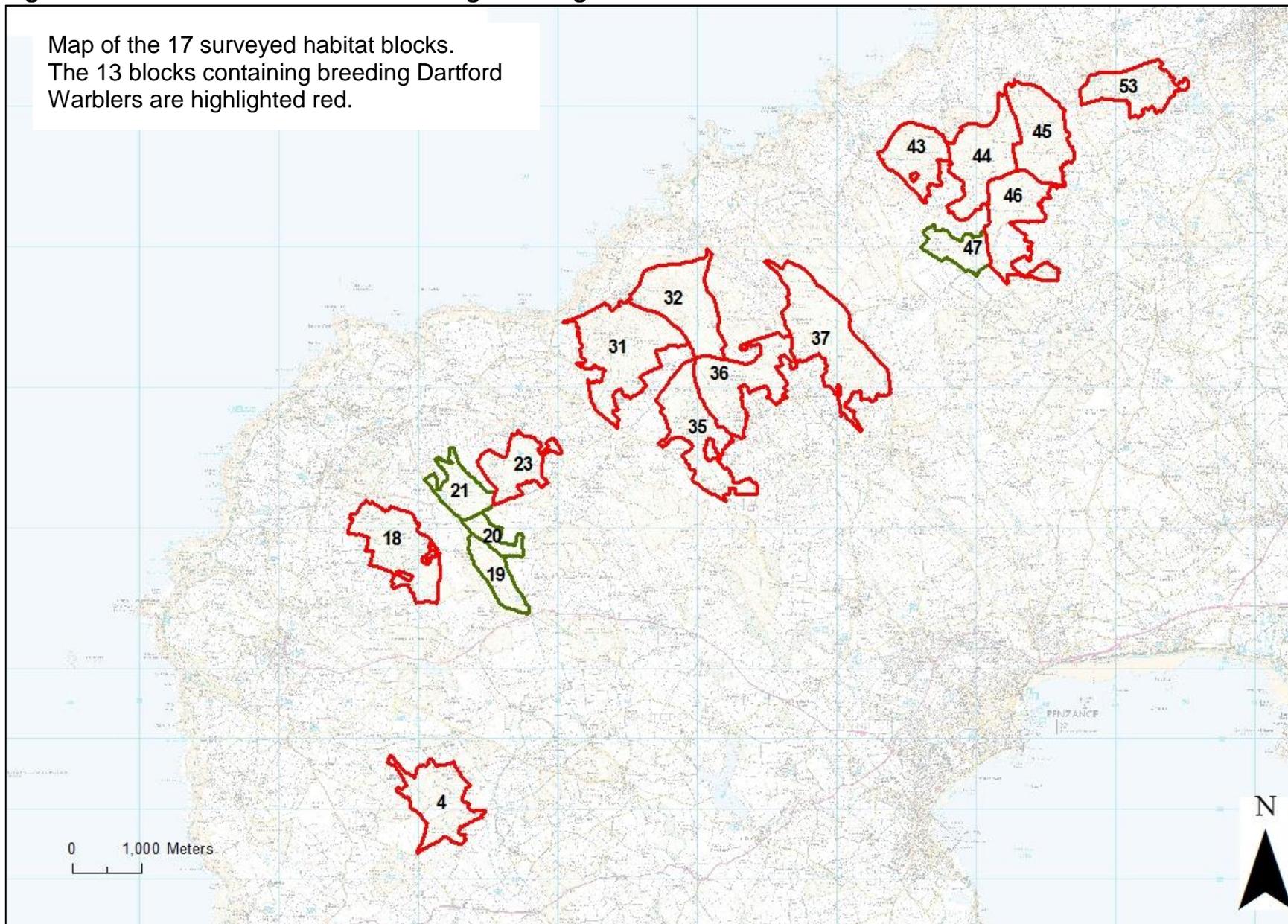
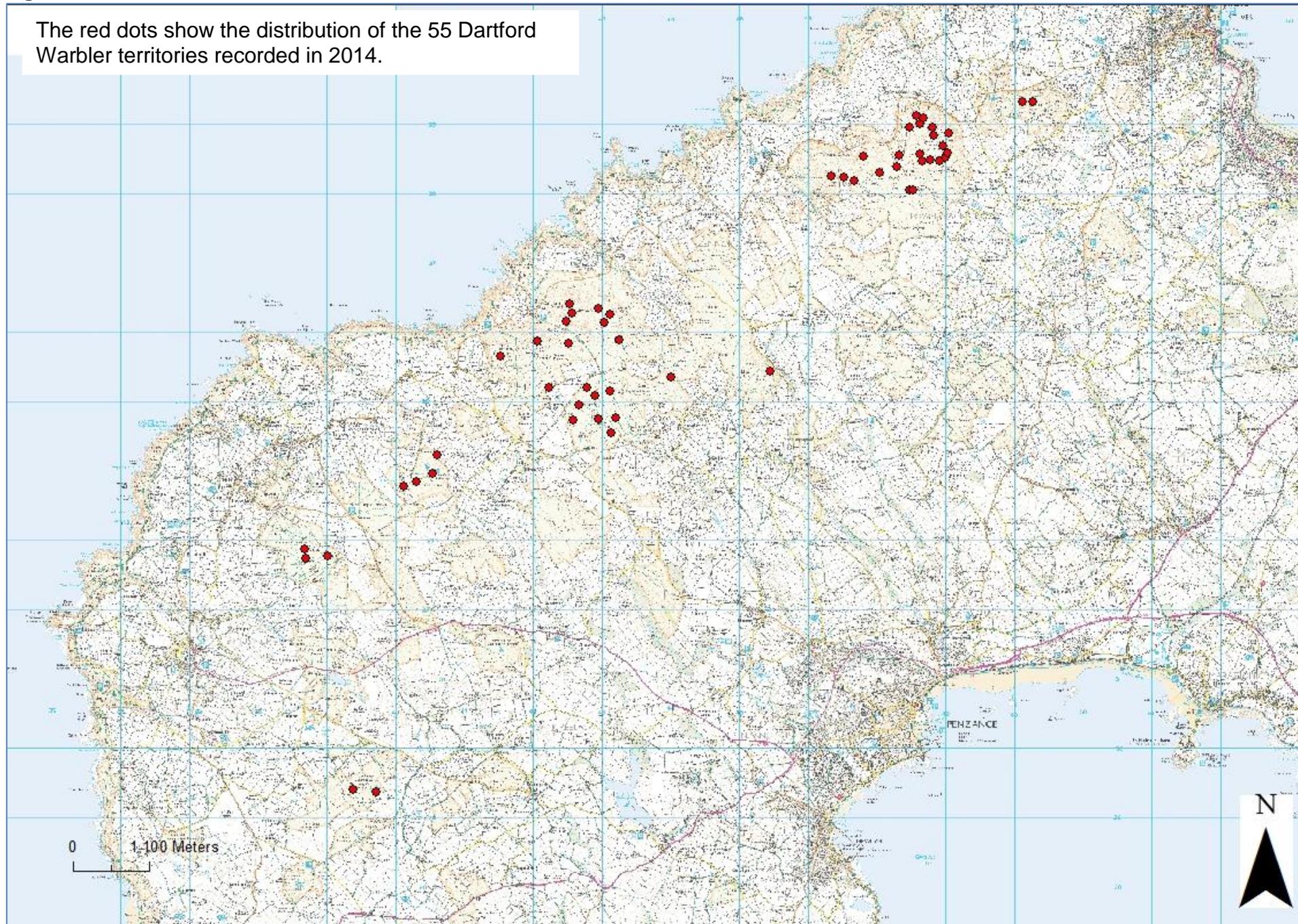


Figure 4. Distribution of Dartford Warblers territories across West Penwith Moors

The red dots show the distribution of the 55 Dartford Warbler territories recorded in 2014.



Nightjar

Surveys for Nightjar were carried out in accordance with the Specification at sites, 31, 32 and 53 as these represented the most suitable sites to gain a representative sample of Nightjar breeding activity. Each site was visited twice; one visit at dusk (20 minutes after dusk and continued for 1.5 hours) and one at dawn (commencing 1 hour before dawn). Visits were not undertaken in winds greater than force 3, rain or poor visibility.

SITE 31

Visit Date	Time	No. Churring Males
18/6/2014	22:00	1
30/7/2014	04:00	2

SITE 32

Visit Date	Time	No. Churring Males
17/6/2014	22:00	2
11/7/2014	03:45	3

SITE 53

Visit Date	Time	No. Churring Males
10/6/2014	22:00	2
31/7/2014	04:00	3

SUMMARY

SITE	Churring Males Highest Count
31	2
32	3
53	3
TOTAL	8

A total of 8 churring males were recorded at the 3 survey sites (Figure 5 and 6). This is below the threshold figure of 46 pairs for Nightjar under Criterion 3.1 ([Musgrove et al. 2013](#)) and so fails to qualify as a "Feature of Interest" for notification.

However, locally they remain an important population. They have been recorded breeding on the Lizard peninsula but the nearest established population is over 50 miles away in North Cornwall. Furthermore, the breeding habitat and sites are not typical of the type of sites normally preferred by Nightjar in the U.K. The majority of breeding sites have a strong association with either coniferous plantation or broadleaf woodland with the edges of these areas being used for foraging. Coniferous and broadleaf woodland do not occur with any great significance within the ranges of breeding sites in West Penwith, and as such this makes the West Penwith population atypical when compared with other U.K. Nightjar sites.

Finally, given that the area surveyed for Nightjar was 13% of the total West Penwith Moors survey area, and examining the geographical spread of territories (Figures 5 and 6), it is possible that other blocks will contain breeding populations of this elusive species. Given their localised status, it is recommended that further survey work is undertaken to clarify any additional breeding locations.

Figure 5. Distribution of blocks surveyed for Nightjars across West Penwith Moors

Map of the 17 surveyed habitat blocks. Blocks which are highlighted blue were surveyed for Nightjar and support breeding populations.

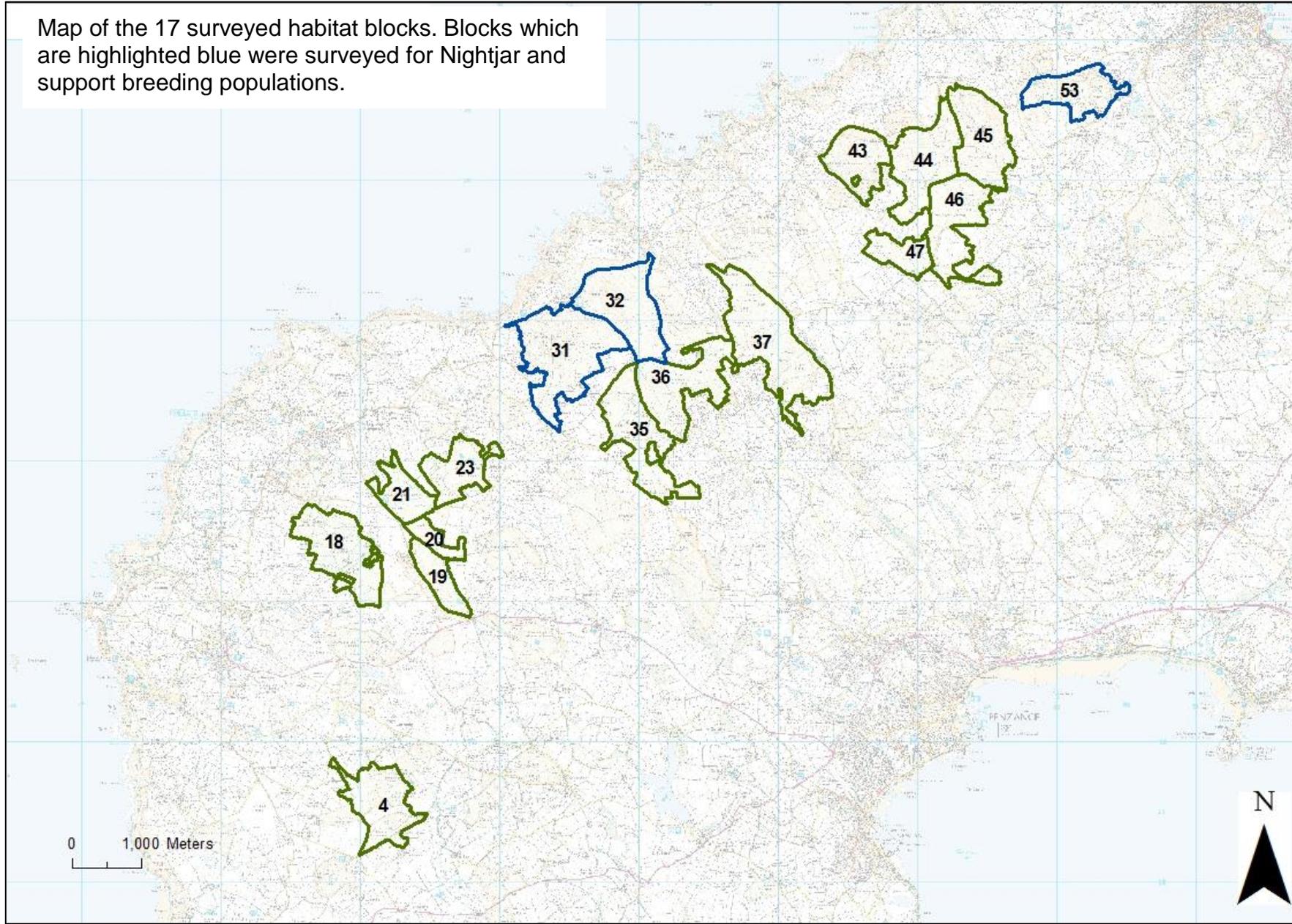
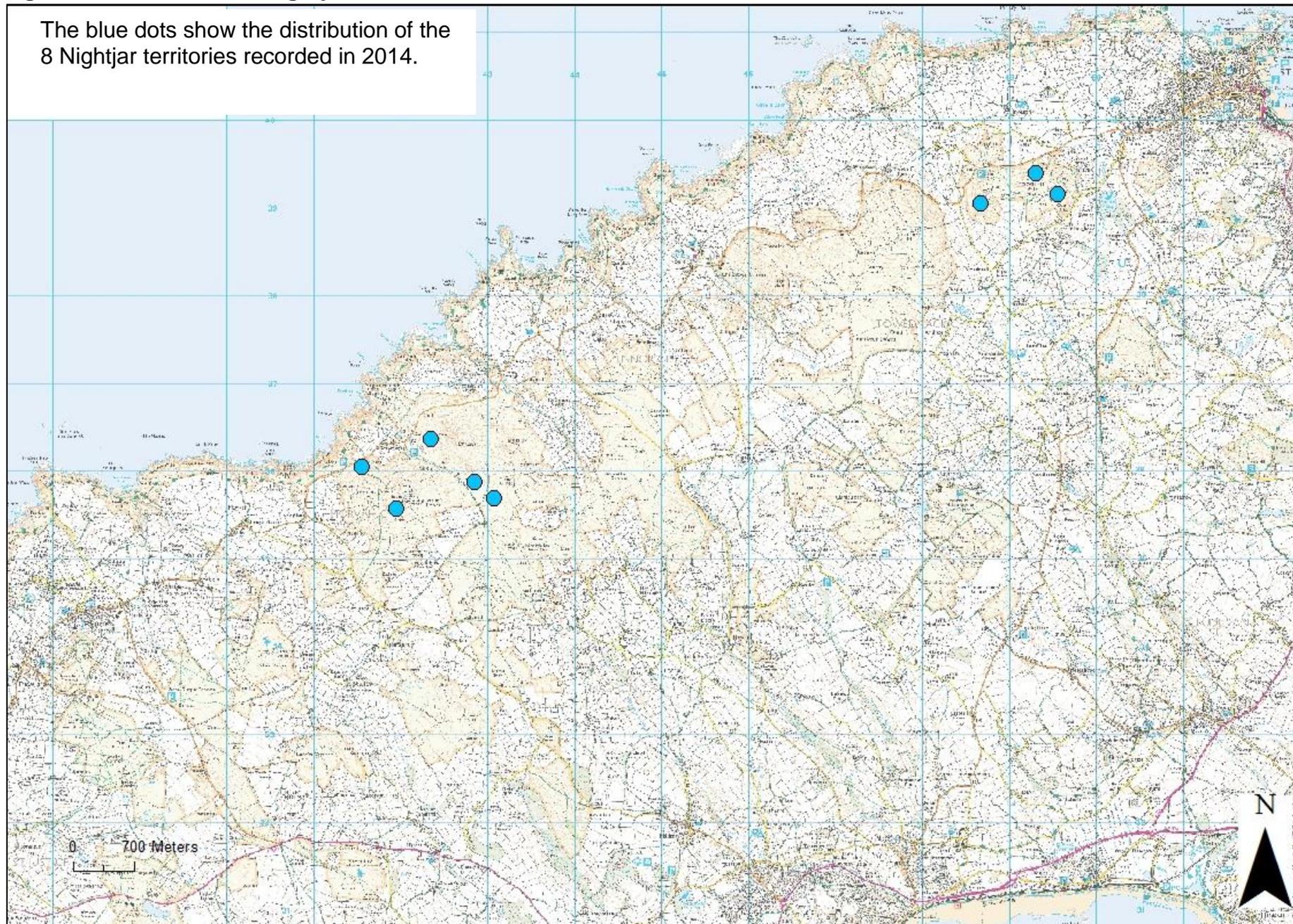


Figure 6. Distribution of Nightjar territories across West Penwith Moors



5. Conclusions

Between March and August 2014 a team from the University of Exeter conducted a bird survey to determine the distribution and breeding status of targeted species within several 'blocks', constituting the majority of suitable lowland heathland, scrub, woodland edge or woodland-scrub and mosaics and transitions between these habitats found across West Penwith Moors.

Each block was surveyed eight times, and during each visit the location of potential breeding sites was recorded, and a photograph taken of the habitat type utilised.

Our results suggest that West Penwith Moors satisfy JNCC SSSI Assessment Criterion 3.1 (the Dartford Warbler population exceeds 1% of the UK threshold figure of 32 pairs) and 3.5 (Assemblages of Breeding Birds on Lowland Heath and the combined habitats of Lowland Heath and Scrub) and should therefore be considered eligible for selection as a SSSI.

The small number of Nightjars recorded does not meet the UK threshold figure of 46 pairs. However, locally they remain an important population and given that only 13% of the total area was surveyed specifically for Nightjar they remain potentially under-recorded.

We suggest that management should continue to be implemented across many sites to ensure that both Dartford Warbler and Nightjar populations remain and expand. Dartford Warbler in particular is reliant on a variety of ages of gorse for nesting, feeding and more critically, to provide shelter in the winter when they can be particularly susceptible to harsh weather.

Finally, West Penwith Moors supports a wide diversity of breeding bird species, and we hope that this survey contributes to highlighting its importance at both local and national levels.

6. References

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7. Appendix

On the site maps, each species can be identified from the coloured key, and the adjacent labels.

A list of species recorded and associated BTO code.

Species	BTO Code
Blackcap	BC
Bullfinch	BF
Buzzard	BZ
Chiffchaff	CC
Coal Tit	CT
Cuckoo	CK
Dartford Warbler	DW
Garden Warbler	GW
Goldcrest	GC
Grasshopper Warbler	GH
Linnet	LI
Long-tailed Tit	LT
Nightjar	NJ
Quail	Q.
Raven	RN
Sparrowhawk	SH
Spotted Flycatcher	SF
Stonechat	SC
Tawny Owl	TO
Wheatear	W.
Whinchat	WC
Whitethroat	WH

A key to species on summary maps

	BC		DW		NJ		TO
	BF		GC		Q.		W.
	BZ		GH		RN		WC
	CC		GW		SC		WH
	CK		LI		SF		
	CT		LT		SH		

Bartinney Downs, Tredinney Common and Numphra Common

Block Number: 4

Grid Reference: SW 393291

Habitat: The southern side of this site is a mix of gorse and heather, with scrub towards the southern tip. There is a narrow section of open grassland in the middle, with more extensive gorse and heather further north. The northern side contains areas of dense gorse.

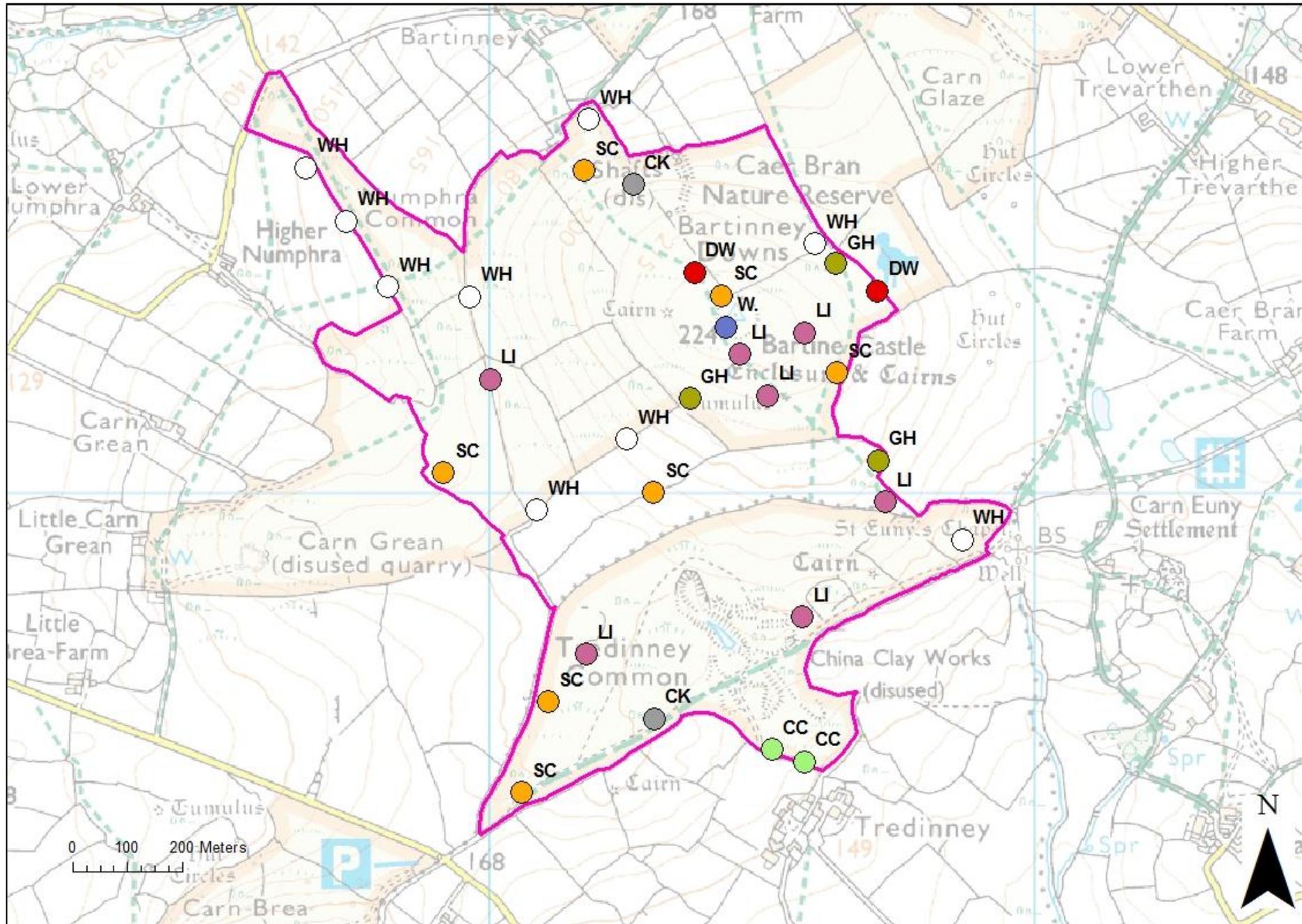
Estimated visual coverage: 80%. On the northern half of this site access was not permitted to the central belt or north eastern corner, but visibility over these areas was good. This remainder of this site was relatively easy to survey, with a good network of paths.

Summary of breeding birds at Block 4 recorded over 8 surveys.

Block 4		Breeding Status		Estimated Number of Territories
Species	Code	Probable	Confirmed	
Chiffchaff	CC	2		2
Cuckoo	CK	2		2
Dartford Warbler	DW		2	2
Grasshopper Warbler	GH	2	1	3
Linnet	LI	6	1	7
Stonechat	SC		7	7
Wheatear	W.	1		1
Whitethroat	WH	6	3	9

Notable species: Martinney supports 2 pairs of Dartford warbler, at least two pairs of Cuckoo, Linnet, Stonechat and Whitethroat, as well as Chiffchaff and Wheatear.

A map of probable and confirmed breeding assemblage species on Bartinney Downs, Tredinney Common and Numphra Common (4).



Carnyorth Common to Bostraze Bog

Block Number: 18

Grid Reference: SW 387275

Habitat: Most of this site contains areas of open heather and gorse with rocky outcrops. The northern tip is open grassland, and the southern tip is damp marshland.

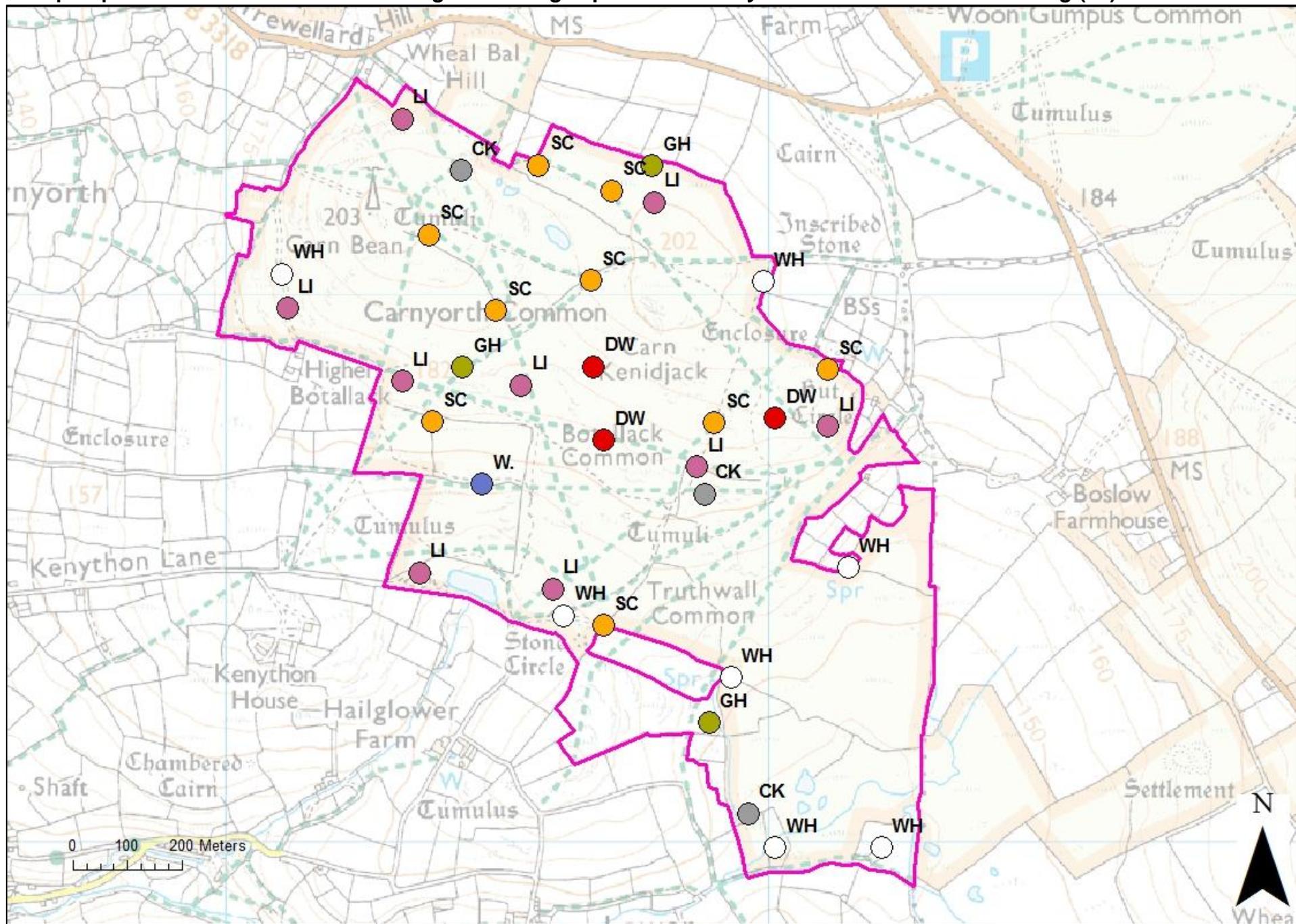
Estimated visual coverage: 95%: The majority of this site was relatively easy to survey, with a good network of paths. However, the boggy area in the southern part of the site was extremely difficult to survey although visibility over this area was good.

Summary of breeding birds at Block 18 recorded over 8 surveys.

Block 18 Species	Code	Breeding Status		Estimated Number of Territories
		Probable	Confirmed	
Cuckoo	CK	3		3
Dartford Warbler	DW	2	1	3
Grasshopper Warbler	GH	3		3
Linnet	LI	6	3	9
Stonechat	SC	3	6	9
Wheatear	W.	1		1
Whitethroat	WH	5	2	7

Notable species: Carnyorth Common supports 3 pairs of Dartford warbler, at least three pairs of Cuckoo, Grasshopper Warbler, Linnet, Stonechat, Whitethroat, as well as Wheatear.

A map of probable and confirmed breeding assemblage species on Carnyorth Common to Bostraze Bog (18).



Dry Carn and North Road

Block Number: 19

Grid Reference: SW 411323

Habitat: This western facing site is a mix of gorse and scrub, with some small granite outcrops and acid grassland sward which has been recently burnt at the time of surveying. There is a significant bracken component to the more southern end of the site with more extensive European and western gorse to the northern end.

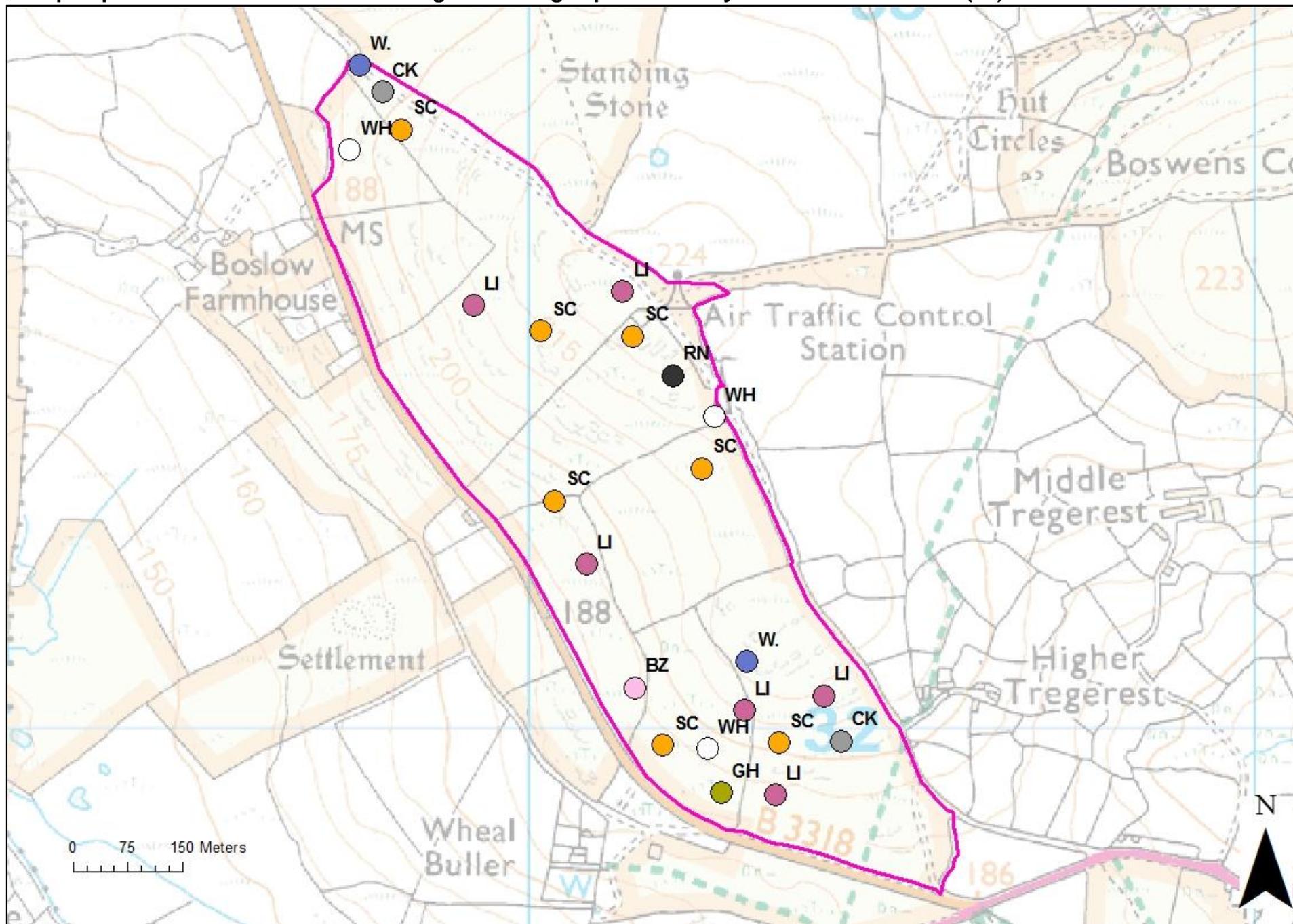
Estimated visual coverage: 85%: This site was challenging to survey as there are only a few well used paths and tracks and large amounts of bracken.

Summary of breeding birds at Block 19 recorded over 8 surveys.

Block 19 Species	Code	Breeding Status		Estimated Number of Territories
		Probable	Confirmed	
Buzzard	BZ	1		1
Cuckoo	CK	2		2
Grasshopper Warbler	GH	1		1
Linnet	LI	1	5	6
Raven	RN		1	1
Stonechat	SC		7	7
Wheatear	W.	2		2
Whitethroat	WH	2	1	3

Notable species: Block 19 supports several Cuckoo, Whitethroat, Linnet, Stonechat, Wheatear and a pair of Raven was recorded breeding on the platform of a communication mast on the north eastern boundary of the site. Buzzard is also a probable breeder.

A map of probable and confirmed breeding assemblage species on Dry Carn and North Road (19).



Dry Carn and Boswens Common West

Block Number: 20

Grid Reference: SW 400329

Habitat: The north western facing slope of this site is extensive dwarf shrub, heath and western gorse, the south eastern end of the site is more dense western and European gorse with an extensive area of recently burnt gorse. None of the habitat is significantly mature and mostly no taller than approximately 450mm. There are some areas of open acid grassland and a pond with some marginal wetland in the southern half of the site.

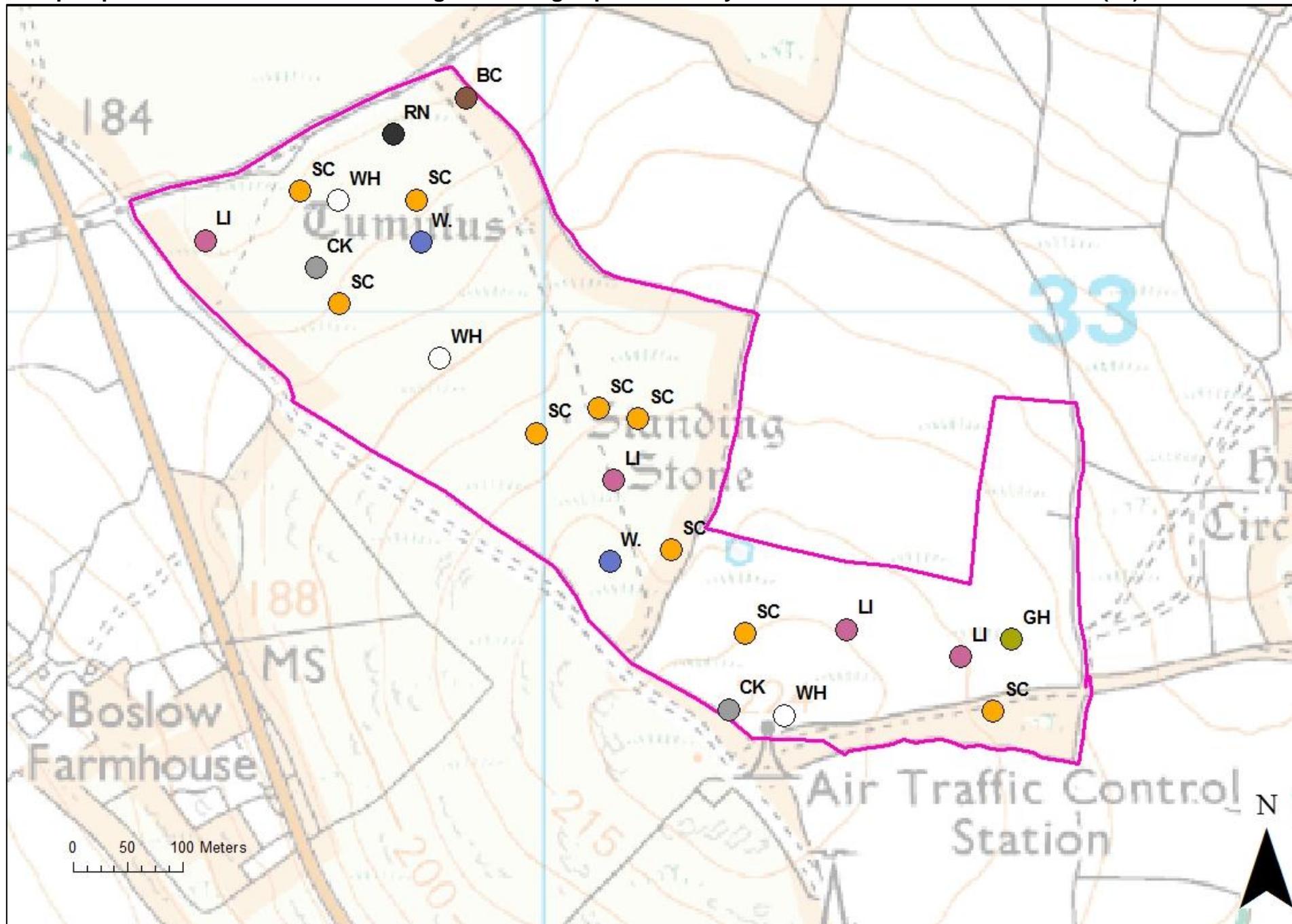
Estimated visual coverage: 95%: This site was very easy to survey, with a good network of paths and the vegetation being short and open.

Summary of breeding birds at Block 20 recorded over 8 surveys.

Block 20 Species	Code	Breeding Status		Estimated Number of Territories
		Probable	Confirmed	
Blackcap	BC	1		1
Cuckoo	CK	2		2
Grasshopper Warbler	GH	1		1
Linnet	LI	1	3	4
Raven	RN		1	1
Stonechat	SC	2	7	9
Wheatear	W.	2		2
Whitethroat	WH	2	1	3

Notable species: This block supports Cuckoo, Wheatear, several pairs of Linnet, and Stonechat. It is also used as a stopover for migratory species, for example, Whimbrel was recorded during the spring. The ponds and margins provide habitat for wintering visitors such as Snipe.

A map of probable and confirmed breeding assemblage species on Dry Carn and Boswens Common West (20).



Woon Gumpus Common

Block Number: 21

Grid Reference: SW 396335

Habitat: The majority of this site is extensive heath and western gorse with some open wet acid grassland areas. There are some small elements of willow carr and shallow valley mire with purple moor grass tussocks and an area of more established scrub with some trees developing in the north western corner of the site. This area also has several ponds across the site which provides good habitat diversity.

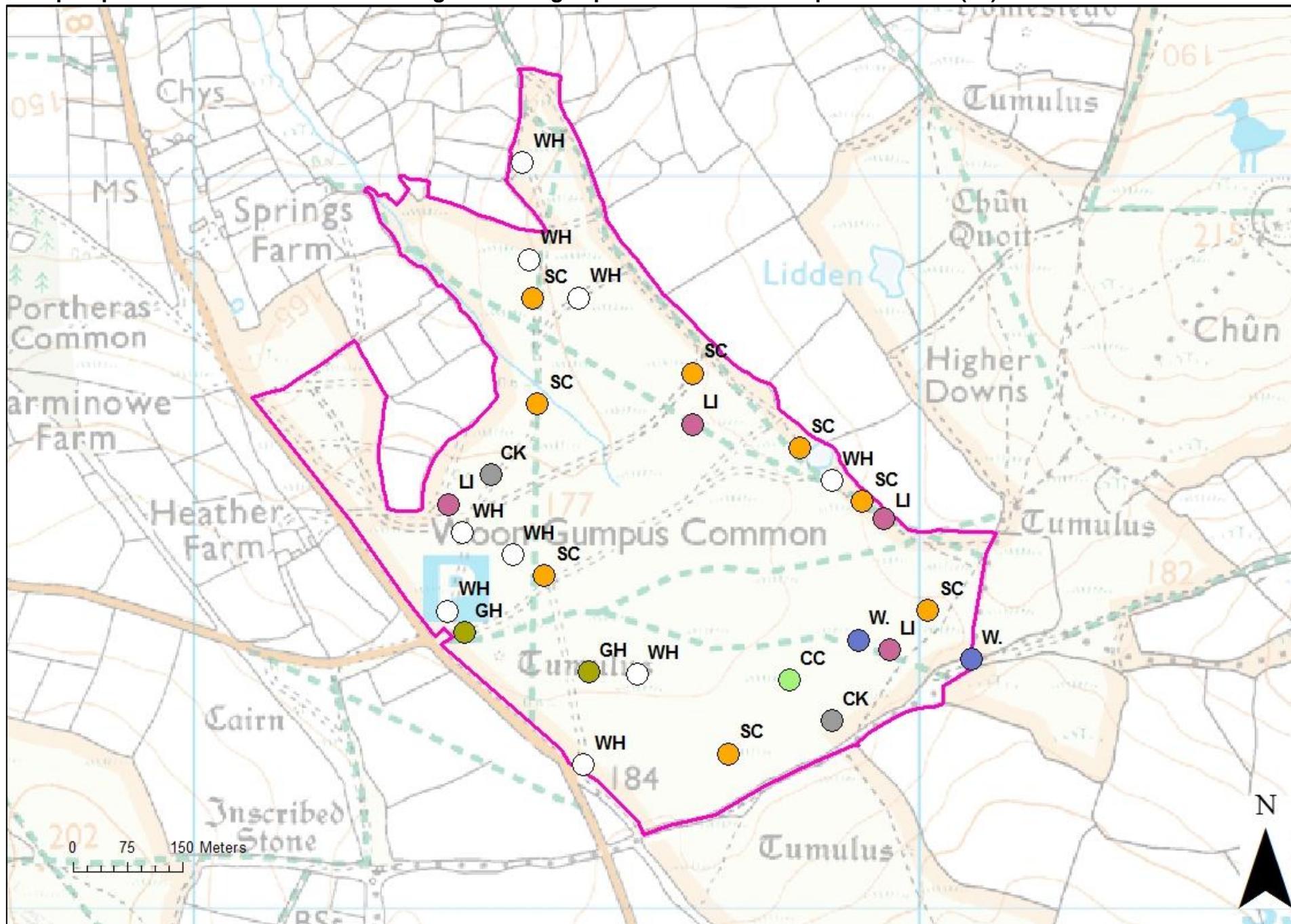
Estimated visual coverage: 95%: This site was very easy to survey, with a good network of paths and the vegetation being short and open.

Summary of breeding birds at Block 21 recorded over 8 surveys.

Block 21 Species	Code	Breeding Status		Estimated Number of Territories
		Probable	Confirmed	
Chiffchaff	CC	1		1
Cuckoo	CK	2		2
Grasshopper Warbler	GH	2		2
Linnet	LI		4	4
Stonechat	SC		8	8
Wheatear	W.	2		2
Whitethroat	WH		9	9

Notable species: This block supports Cuckoo, Stonechat, Linnet, Grasshopper Warbler, Wheatear and Whitethroat. The ponds and margins provide habitat for wintering visitors such as Snipe.

A map of probable and confirmed breeding assemblage species on Woon Gumpus Common (21).



Higher Downs and Chun Downs

Block Number: 23

Grid Reference: SW 404349

Habitat: The majority of this site is extensive, mature heath and western gorse with particularly dense stands of European Gorse and bracken / bramble scrub. There are some small elements of shallow valley mire with purple moor grass tussocks in the area surrounding a pond in the western corner of the site. The site contains significant archaeological features with Chun Quoit and Chun Castle, an Iron Age hill fort, attracting many visitors.

Estimated visual coverage: 75%: There was no access to the southern half of this site and the remainder of the site was difficult to survey. There were some good paths but also very dense areas of vegetation making some transect routes difficult to complete.

Summary of breeding birds at Block 23 recorded over 8 surveys.

Block 23 Species	Code	Breeding Status		Estimated Number of Territories
		Probable	Confirmed	
Cuckoo	CK	2		2
Dartford Warbler	DW	2	2	4
Grasshopper Warbler	GH	2		2
Linnet	LI	2	3	5
Stonechat	SC		4	4
Wheatear	W.	2		2
Whitethroat	WH		6	6

Notable species: This block supports Cuckoo, Stonechat, Linnet, Wheatear, Whitethroat and several pairs of Dartford Warbler. The pond and margins provide habitat for wintering visitors such as Snipe.

Watch Croft, Trevean, White Downs and Bosullow Common

Block Number: 31

Grid Reference: SW 420355

Habitat: The majority of this site is extensive, mature heath, European and western gorse with particularly dense stands of European Gorse and bracken / bramble scrub. There are also elements of acid grassland, dwarf wet heath and some stands of purple moor grass. The north western slopes of the site are covered with extensive mine workings, open shafts and some mine dumped material from the 18th and 19th Centuries. Around the mine workings there are stands of willow and a small area of mixed woodland on the very northwestern corner of the site. There are extensive granite outcrops on the top and northern slopes of the site.

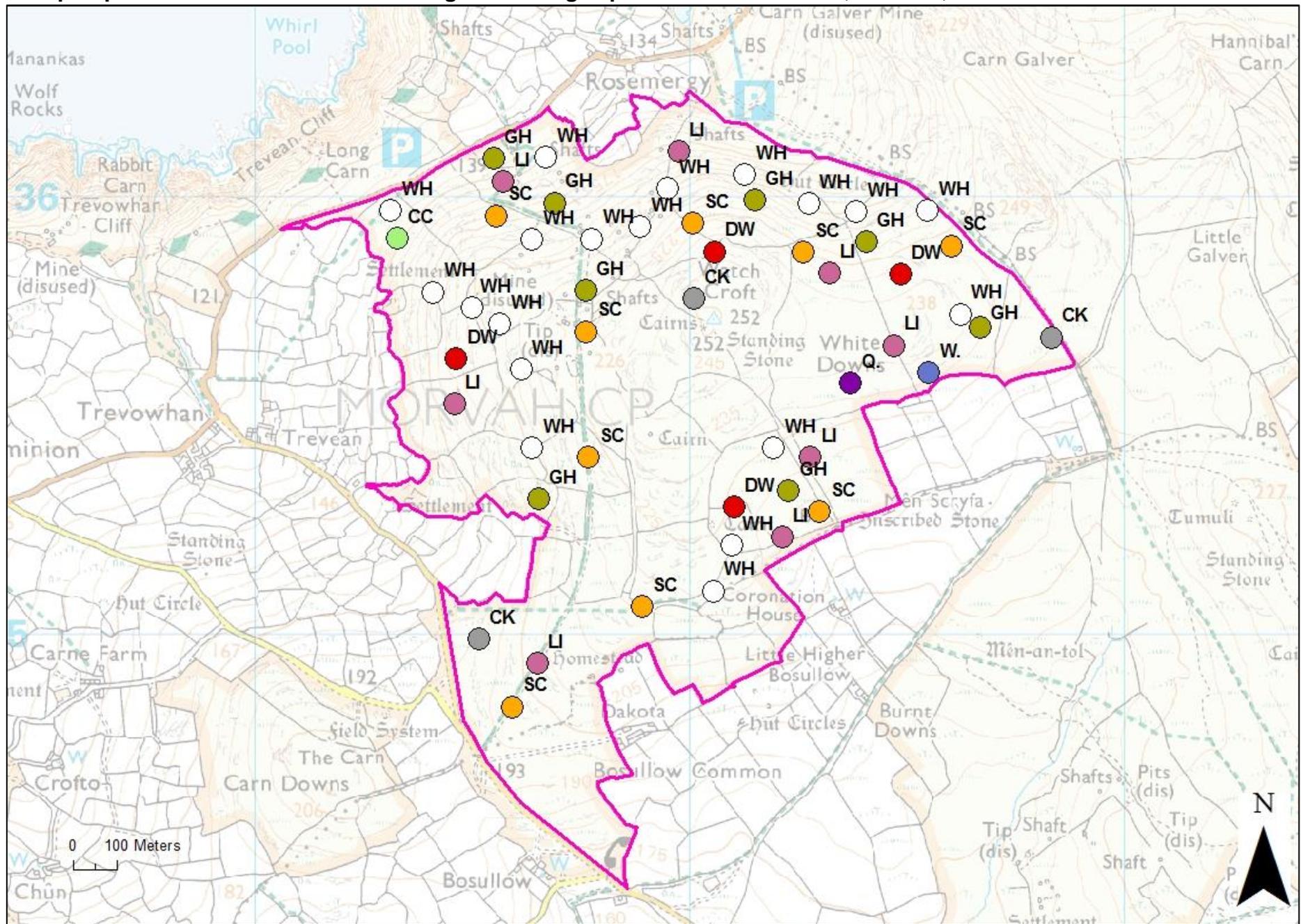
Estimated visual coverage: 75%: There was no access to the south western corner of this site. The remainder of this site was difficult to survey, it contained some good paths but also very dense areas of vegetation making some transect routes difficult to complete. The presence of open mine shafts also meant that transects had to avoid some areas due to safety considerations.

Summary of breeding birds at Block 31 recorded over 8 surveys.

Block 31 Species	Code	Breeding Status		Estimated Number of Territories
		Probable	Confirmed	
Chiffchaff	CC	1		1
Cuckoo	CK	2	1	3
Dartford Warbler	DW		4	4
Grasshopper Warbler	GH	5	3	8
Linnet	LI	3	5	8
Quail	Q.	1		1
Stonechat	SC		9	9
Wheatear	W.	1		1
Whitethroat	WH		19	19

Notable species: This block supports good populations of Cuckoo, Stonechat, Linnet, Whitethroat, several pairs of Dartford Warbler and Wheatear. Quail is also a probable breeder. Two pairs of Nightjar were recorded during the Nightjar surveys. Barn Owl is breeding in the derelict farm close to the south eastern boundary of the site and wintering Hen Harriers are known to use the site annually.

A map of probable and confirmed breeding assemblage species on Watch Croft, Trevean, White Downs and Bosullow Common (31).



Carn Galver

Block Number: 32

Grid Reference: SW 429362

Habitat: The majority of this site is extensive, mature heath, European and western gorse with particularly dense stands of European Gorse and bracken / bramble scrub. There are also elements of acid grassland, dwarf wet heath and some stands of purple moor grass. There are extensive granite outcrops on the top and northern slopes of the site. There are also several areas of willow, particularly in a wet area in the north eastern corner of the site where there is good willow carr habitat.

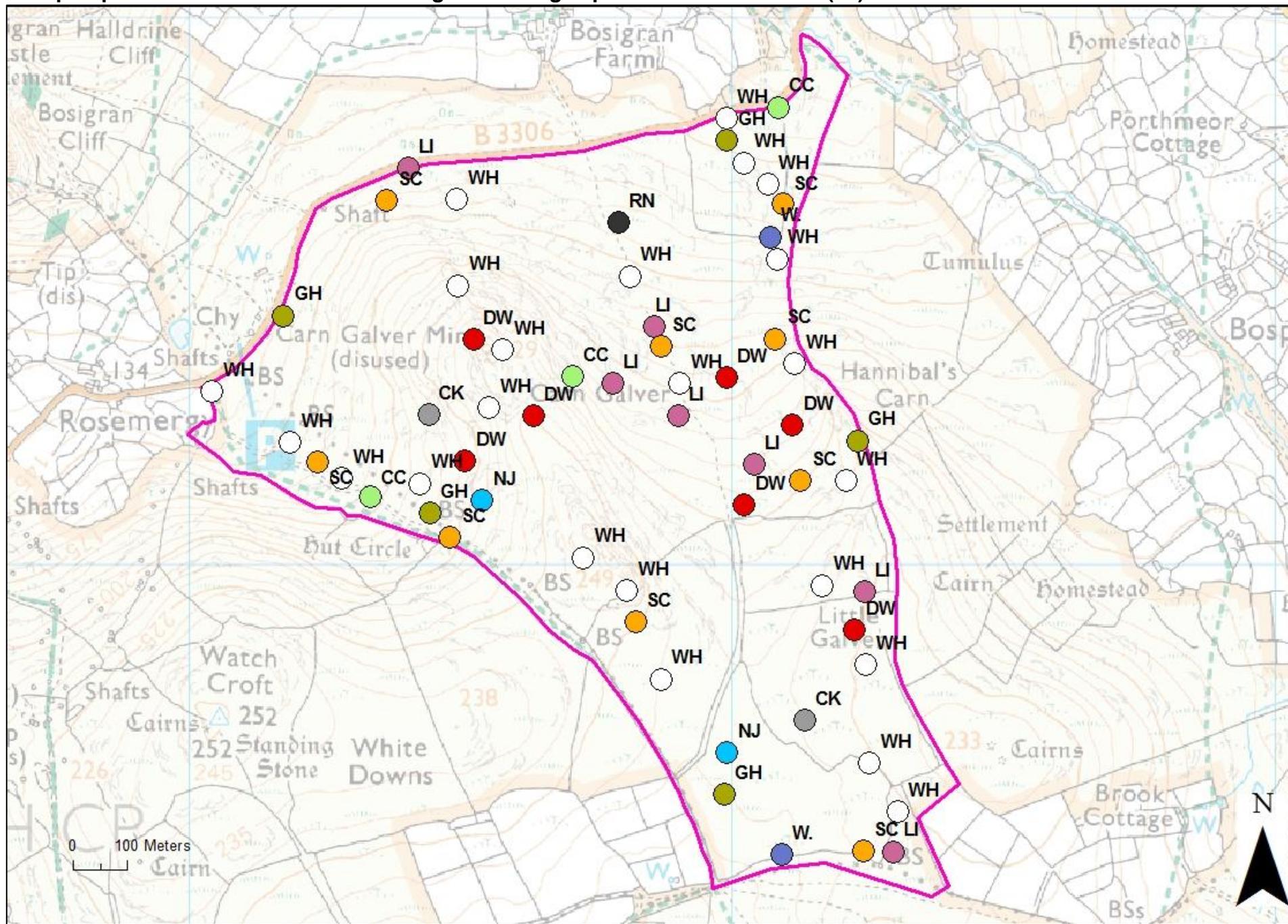
Estimated visual coverage: 85%: This site was difficult to survey, with some good paths but very dense areas of vegetation making effective transect routes difficult to complete. The topography of the site did help to give good observation down slope in areas of dense vegetation.

Summary of breeding birds at Block 32 recorded over 8 surveys.

Block 32 Species	Code	Breeding Status		Estimated Number of Territories
		Probable	Confirmed	
Chiffchaff	CC	2	1	3
Cuckoo	CK	2		2
Dartford Warbler	DW	3	4	7
Grasshopper Warbler	GH	3	2	5
Linnet	LI	2	5	7
Nightjar	NJ	2		2
Raven	RN		1	1
Stonechat	SC	1	8	9
Wheatear	W.	2		2
Whitethroat	WH	4	19	23

Notable species: This block supports good populations of Dartford Warbler, Cuckoo, Stonechat, Linnet, Whitethroat, Wheatear and two pairs of Nightjar were recorded during the diurnal surveys, although three pairs were recorded during specific Nightjar surveys. There is also a pair of Ravens using the site and are probably breeding amongst the granite outcrops. Hen Harriers are known to use the site in winter.

A map of probable and confirmed breeding assemblage species on Carn Galver (32).



Men-an-Tol Croft, Lanyon Croft and Bosilliack

Block Number: 35

Grid Reference: SW 430343

Habitat: The majority of this site is extensive, mature heath, European and western gorse with particularly dense stands of European Gorse and bracken / bramble scrub. There are also elements of acid grassland, dwarf wet heath and some extensive stands of purple moor grass. There are extensive mine workings, open shafts and some mine dumped material from the 18th and 19th Centuries. Around the mine workings there are stands of willow. The site also includes significant valley mire at the southern end of the site with Royal Fern and other notable wet heath and bog species.

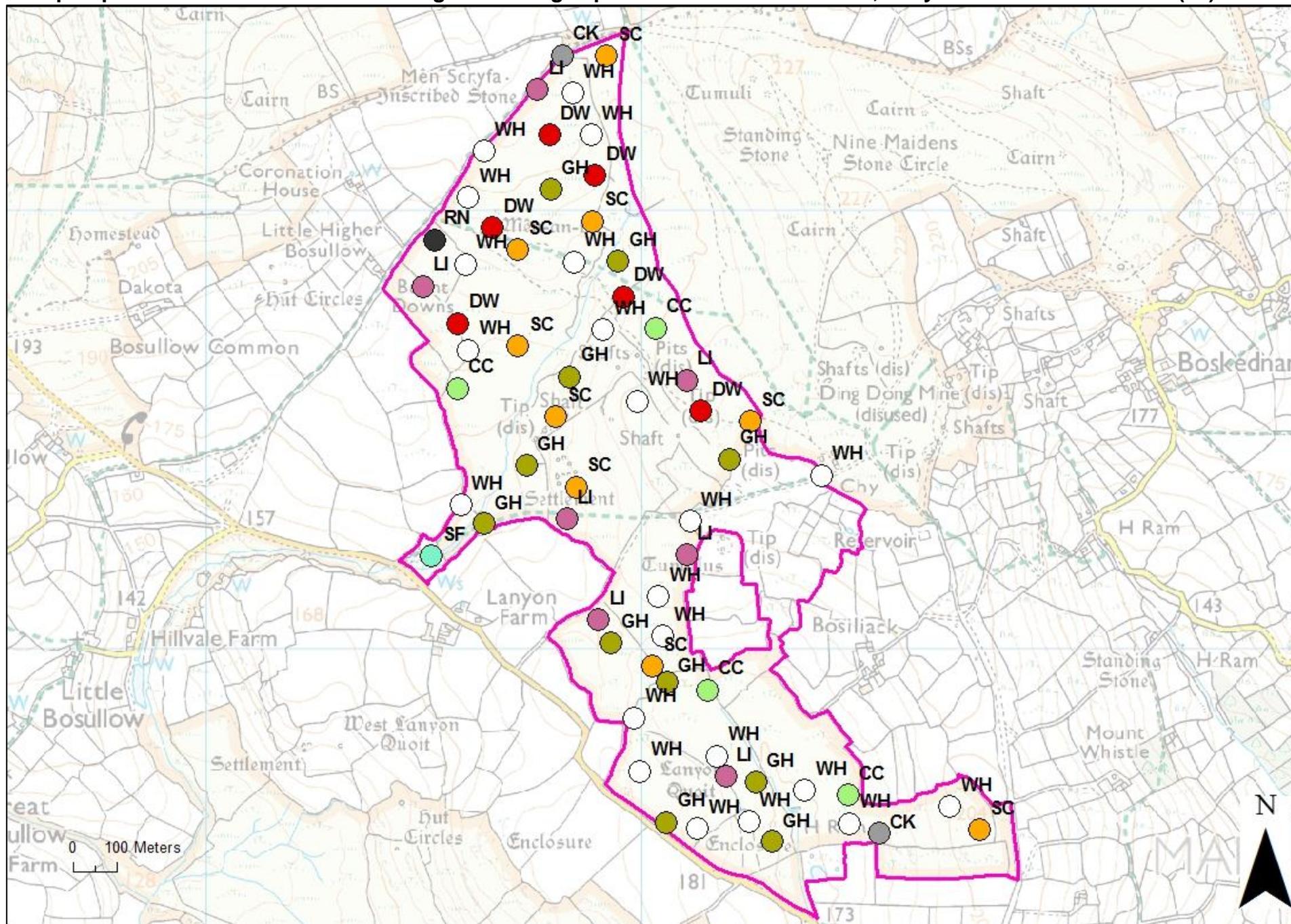
Estimated visual coverage: 80%: This site was difficult to survey, with some good paths but very dense areas of vegetation making some transect routes difficult to complete. Also the presence of open mine shafts meant that transects had to avoid some areas due to safety considerations.

Summary of breeding birds at Block 35 recorded over 8 surveys.

Block 35 Species	Code	Breeding Status		Estimated Number of Territories
		Probable	Confirmed	
Chiffchaff	CC	3	1	4
Cuckoo	CK	2		2
Dartford Warbler	DW	4	2	6
Grasshopper Warbler	GH	8	3	11
Linnet	LI	2	5	7
Raven	RN	1		1
Stonechat	SC		9	9
Spotted Flycatcher	SF	1		1
Whitethroat	WH	4	18	22

Notable species: This block supports good populations of Cuckoo, Stonechat, Linnet, Whitethroat, and six pairs of Dartford Warbler. Hen Harriers are known to use the site annually and the most important winter roost site occupies part of this block. Short-eared owls also use the site extensively in the winter. Spotted Flycatcher was recorded breeding in the small area of woodland on the western boundary of the site.

A map of probable and confirmed breeding assemblage species on Men-an-Tol Croft, Lanyon Croft and Bosilliack (35).



Nine Maidens Common

Block Number: 36

Grid Reference: SW 436351

Habitat: The majority of this site is extensive, mature heath, European and western gorse with particularly dense stands of European Gorse and bracken / bramble scrub. There are also elements of acid grassland, dwarf wet heath and some stands of purple moor grass. There is a small but significant area of mixed conifer and broadleaved woodland on the northern edge of the site. There is also a substantial area of valley mire and willow carr on the eastern side of the site. There are significant mine workings and dumps as well as notable archaeological features including the Nine Maidens stone circle.

Estimated visual coverage: 80%: This site was difficult to survey, with some good paths but very dense areas of vegetation making effective transect routes difficult to complete. Also the presence of open mine shafts meant that transects had to avoid some areas due to safety considerations.

Summary of breeding birds at Block 36 recorded over 8 surveys.

Block 36 Species	Code	Breeding Status		Estimated Number of Territories
		Probable	Confirmed	
Blackcap	BC		1	1
Buzzard	BZ	1		1
Chiffchaff	CC	1	3	4
Cuckoo	CK	1	1	2
Coal Tit	CT		1	1
Dartford Warbler	DW	2	1	3
Grasshopper Warbler	GH	2	3	5
Linnet	LI	2	10	12
Long-tailed Tit	LT		1	1
Stonechat	SC	2	14	16
Tawny Owl	TO	1		1
Whitethroat	WH	11	7	18

Notable species: This block supports good populations of Cuckoo, Stonechat, Linnet, Whitethroat, several pairs of Dartford Warbler and species associated with the woodland component including Tawny Owl, Blackcap, and both Coal and Long-tailed Tits.

Mulfra Hill to Treen Common

Block Number: 37

Grid Reference: SW 452354

Habitat: The majority of this site is extensive acid grassland and mature, European and western gorse with particularly dense stands of European Gorse on the south eastern slopes. There are stands of broadleaved and coniferous woodland on the site boundaries and some heath that includes both wet and dry heath species.

Estimated visual coverage: 90%: Only the southern half of this site was surveyed, and there was no access to the south eastern corner. The remainder was predominantly easy to survey, with some good paths but very dense areas of vegetation made some areas more challenging. However, topography allows good downslope observation in some of these areas.

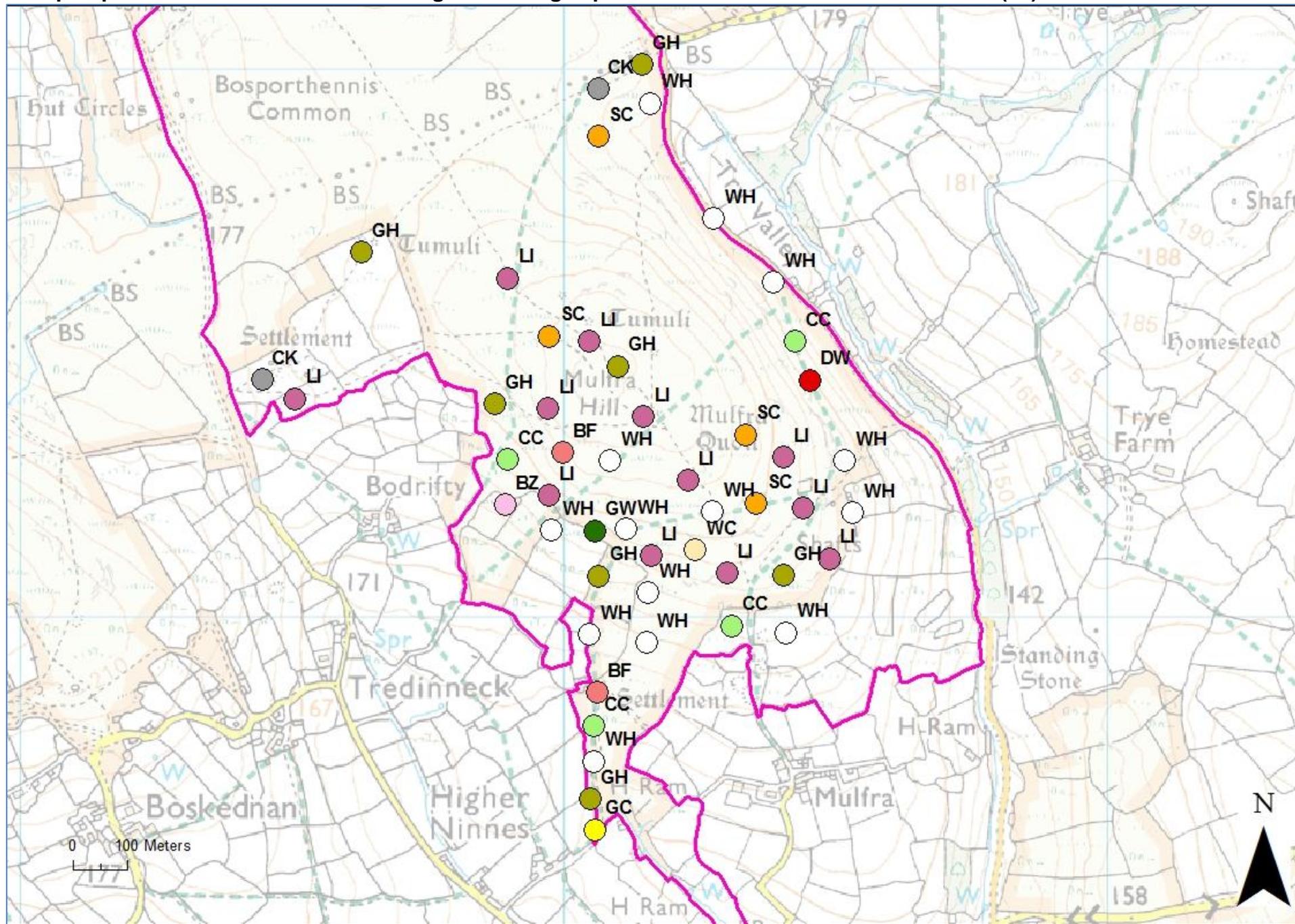
Summary of breeding birds at Block 37 recorded over 8 surveys.

Block 37 Species	Code	Breeding Status		Estimated Number of Territories
		Probable	Confirmed	
Bullfinch	BF	2		2
Buzzard	BZ		1	1
Chiffchaff	CC		4	4
Cuckoo	CK	2		2
Dartford Warbler	DW		1	1
Goldcrest	GC		1	1
Grasshopper Warbler	GH	4	3	7
Garden Warbler	GW	1		1
Linnet	LI	7	5	12
Stonechat	SC	4		4
Whitethroat	WH	9	5	14

Notable species: This block supports good populations of Cuckoo, Stonechat, Linnet, Bullfinch, Whitethroat and some species associated with the woodland margins including a pair of Common Buzzard, Garden Warbler and Goldcrest. One pair of Dartford Warblers was also recorded.

Yellowhammer also breed on the site which whilst not a target species for this survey are a bird of note in West Penwith due to a significant decline in their population. Whinchat was also recorded in suitable breeding habitat, but was not included as a probable breeder.

A map of probable and confirmed breeding assemblage species on Mulfra Hill to Treen Common (37).



Zennor Hill and Rosemorran

Block Number: 43

Grid Reference: SW 461827

Habitat: Most of this site is covered in dense gorse and bracken. At the top of the hill there is quite an extensive area of heather, interspersed with rocky outcrops. On the south western side of the site the habitat develops into scrub with small amounts of woodland adjacent to residential gardens.

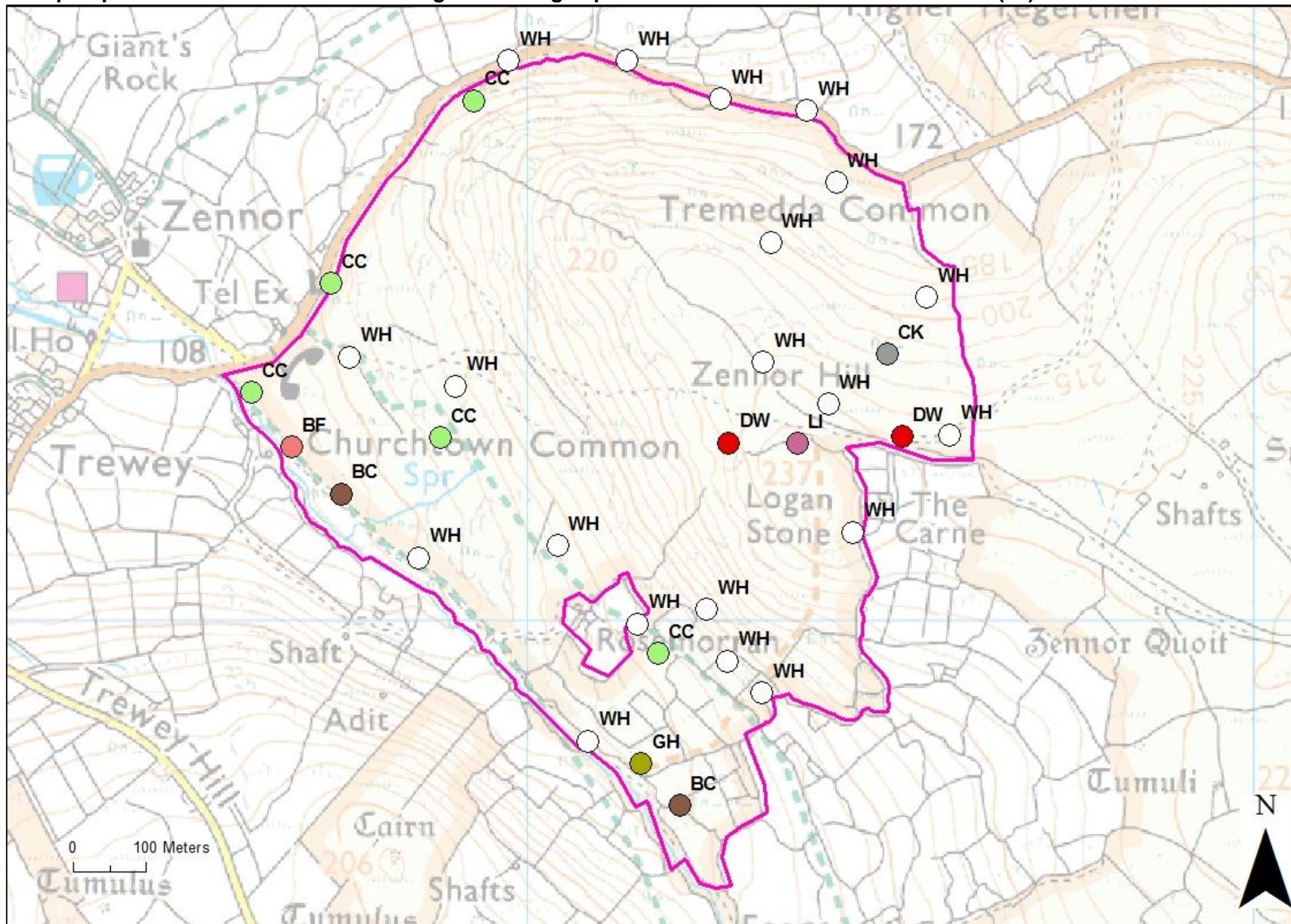
Estimated visual coverage: 75%: This site was extremely difficult to survey, with much of the interior consisting of steep slopes covered in dense gorse and bracken. Fortunately much of the site could be viewed from the road, and there were several good paths crossing the site with better access on the south western side.

Summary of breeding birds at Block 43 recorded over 8 surveys.

Block 43 Species	Code	Breeding Status		Estimated Number of Territories
		Probable	Confirmed	
Blackcap	BC	2		2
Bullfinch	BF	1		1
Chiffchaff	CC	5		5
Cuckoo	CK	1		1
Dartford Warbler	DW	2		2
Grasshopper Warbler	GH	1		1
Linnet	LI		1	1
Whitethroat	WH	17	3	20

Notable species: This block supports good populations of Chiffchaff, Whitethroat and two pairs of Blackcap and Dartford Warbler.

A map of probable and confirmed breeding assemblage species on Zennor Hill and Rosemorran (43).



Foage Farm to Sperris Croft and Boscubben Croft

Block Number: 44

Grid Reference: SW 470825

Habitat: Most of the northern part of this site is covered in gorse and bracken. The central belt is predominated by a mix of heather and gorse, which is interspersed with more grassy areas. Towards the south west the area becomes slightly more open and again dominated by a mix of gorse and bracken.

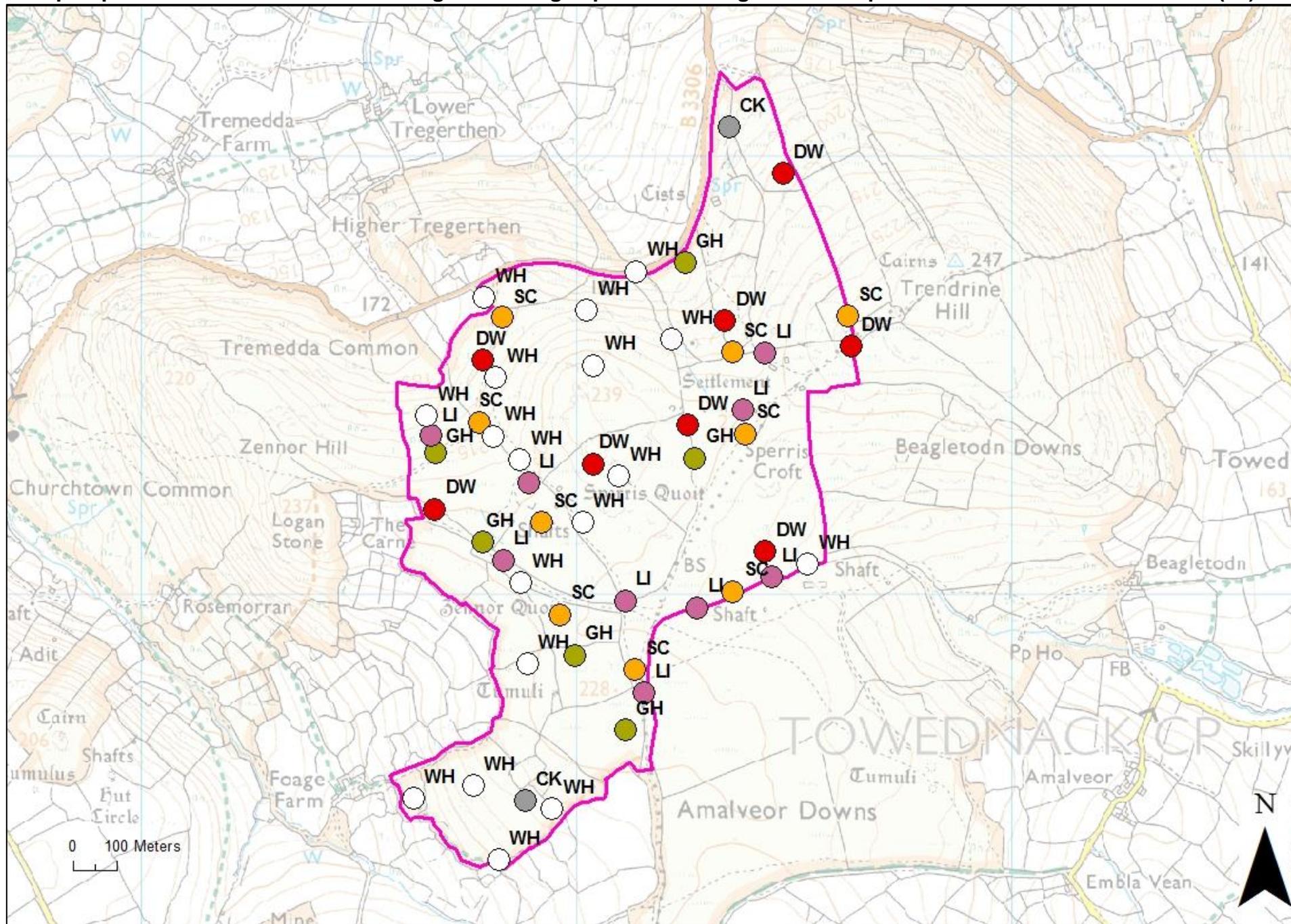
Estimated visual coverage: 90%: This site was relatively straightforward to survey with a reasonable network of paths.

Summary of breeding birds at Block 44 recorded over 8 surveys.

Block 44 Species	Code	Breeding Status		Estimated Number of Territories
		Probable	Confirmed	
Cuckoo	CK	2		2
Dartford Warbler	DW	5	3	8
Grasshopper Warbler	GH	6		6
Linnet	LI	7	2	9
Stonechat	SC	2	7	9
Whitethroat	WH	15	3	18

Notable species: This block supports good populations of Dartford Warbler, Grasshopper Warbler, Stonechat, Linnet and at least two pairs of Cuckoo.

A map of probable and confirmed breeding assemblage species on Foage Farm to Sperris Croft and Boscubben Croft (44).



Trendrine Hill and Beagletodn Downs

Block Number: 45

Grid Reference: SW 480853

Habitat: Most of the eastern slopes are covered in dense gorse and bracken. On the hill heather with rocky outcrops predominates, with thick gorse covering the western slopes which become more scrub dominated at the lower altitudes.

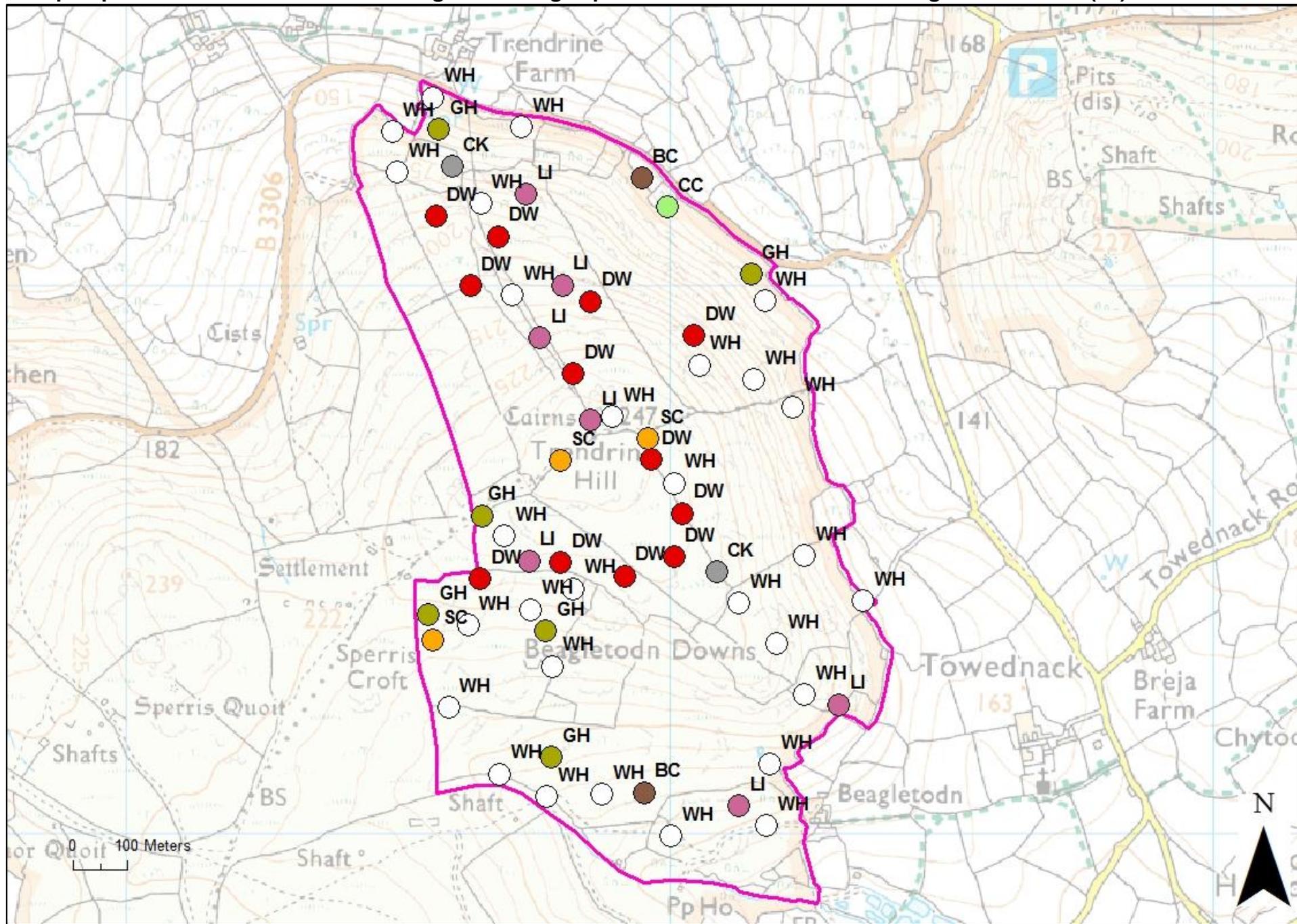
Estimated visual coverage: 80%: This site was extremely difficult to survey with only a few paths which quickly become covered in bracken throughout the season. However, visibility across the site is good. There are also a number of inconspicuous mine shafts making the site potentially dangerous to survey.

Summary of breeding birds at Block 45 recorded over 8 surveys.

Block 45 Species	Code	Breeding Status		Estimated Number of Territories
		Probable	Confirmed	
Blackcap	BC	2		2
Chiffchaff	CC	1		1
Cuckoo	CK	2		2
Dartford Warbler	DW	8	4	12
Grasshopper Warbler	GH	6		6
Linnet	LI	4	3	7
Stonechat	SC		3	3
Whitethroat	WH	27	2	29

Notable species: This block supports high populations of Dartford Warbler, Whitethroat and Grasshopper Warbler, as well as Stonechat and Linnet and at least two pairs of Cuckoo.

A map of probable and confirmed breeding assemblage species on Trendrine Hill and Beagletodn Downs (45).



Amalveor Downs to Noon Billas

Block Number: 46

Grid Reference: SW 475751

Habitat: Most of this site is covered with a mixture of heather and grassland interspersed with areas of gorse and bracken.

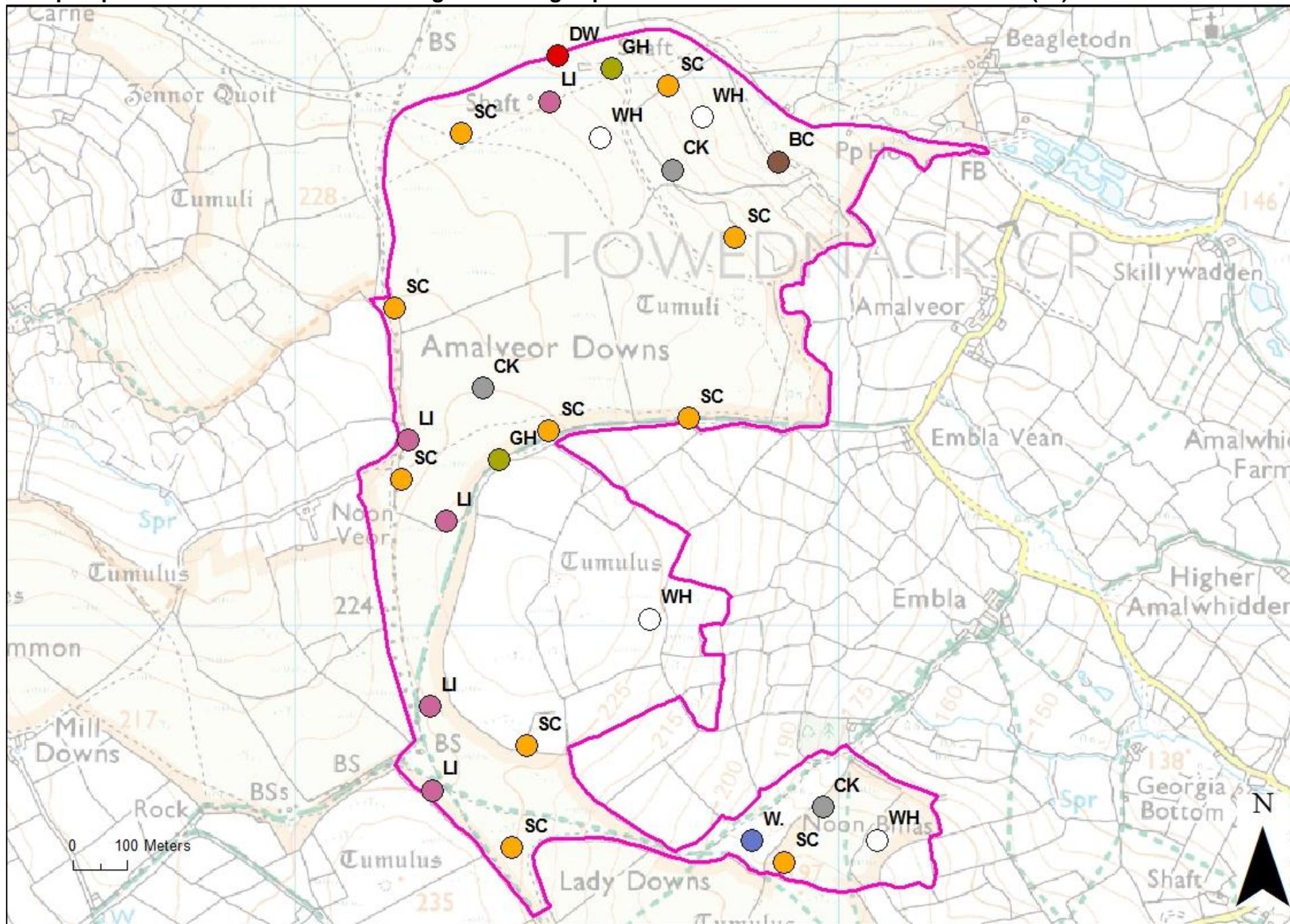
Estimated visual coverage: 90%: This site was relatively straightforward to survey with a reasonable network of paths.

Summary of breeding birds at Block 46 recorded over 8 surveys.

Block 46 Species	Code	Breeding Status		Estimated Number of Territories
		Probable	Confirmed	
Blackcap	BC	1		1
Cuckoo	CK	3		3
Dartford Warbler	DW		1	1
Grasshopper Warbler	GH	2		2
Linnet	LI	1	4	5
Stonechat	SC	1	9	10
Wheatear	W.	1		1
Whitethroat	WH	4		4

Notable species: This block supports good populations of Cuckoo and Stonechat, as well as Grasshopper Warbler, Wheatear and a pair of Dartford Warbler.

A map of probable and confirmed breeding assemblage species on Amalveor Downs to Noon Billas (46).



Trewey Common

Block Number: 47

Grid Reference: SW 467693

Habitat: Most of this site is covered with a mixture of heather and gorse interspersed with areas of grassland.

Estimated visual coverage: 90%: This site was relatively straightforward to survey with a reasonable network of paths and cleared rides.

Summary of breeding birds at Block 47 recorded over 8 surveys.

Block 47	Species	Code	Breeding Status		Estimated Number of Territories
			Probable	Confirmed	
	Cuckoo	CK	2		2
	Linnet	LI	6	1	7
	Stonechat	SC		7	7
	Whitethroat	WH	10	2	12

Notable species: This block supports good populations of Stonechat, Linnet and Whitethroat, as well as at least two pairs of Cuckoo.

Rosewall Hill

Block Number: 53

Grid Reference: SW 493393

Habitat: The western side of this site is a mix of gorse and scrub, with rocky outcrops at the highest points. The middle has more extensive belts of dense gorse and heather, although interspersed with large areas of more open, grassland areas which are grazed. The eastern end is a mix of scrub and woodland with clearings containing large amounts of bracken.

Estimated visual coverage: 90%: For the majority of surveys, there was no access to a block of land just to the east of the most southerly point (although see Additional Information). The majority of this site was relatively easy to survey, with a good network of paths. However, there were large areas of impenetrable gorse, and surveying both the western and eastern end were trickier as paths were less frequent and more prone to become inaccessible as the season progressed and bracken became more dominant. However, visibility across this site is good.

Summary of breeding birds at Block 53 recorded over 8 surveys.

Block 53 Species	Code	Breeding Status		Estimated Number of Territories
		Probable	Confirmed	
Blackcap	BC	4		4
Bullfinch	BF	2		2
Chiffchaff	CC	6		6
Cuckoo	CK	2		2
Dartford Warbler	DW		2	2
Linnet	LI	9	1	10
Raven	RN		1	1
Stonechat	SC	1	3	4
Whitethroat	WH	15		15

Notable species: Rosewall Hill supports 2 pairs of Dartford warbler, numerous Chiffchaff and Whitethroat, several pairs of Linnet, Stonechat, Blackcap, at least two pairs of Cuckoo and a pair of Raven. Three pairs of Nightjar were recorded during specific Nightjar surveys. It is also used as a stopover for migratory species, for example, both Whimbrel and Ring Ouzel were recorded in the grassier, open areas during the spring.

Additional Information: Both surveyors visited the fenced off area at SW495391 as an extension to survey visit 6 on 7/7/2014 to assess species composition and management of this relatively small area. Although there were few species present, both surveyors felt that this was because the gorse was relatively dense and uniformly aged.

A map of probable and confirmed breeding assemblage species on Rosewall Hill (53).

