

West Penwith Moors, Cornwall, Dartford Warbler Survey 2015.

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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.

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Further information

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**WEST PENWITH MOORS,
CORNWALL
DARTFORD WARBLER SURVEY 2015**

S.H. Crummay 2015

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WEST PENWITH MOORS, CORNWALL – DARTFORD WARBLER SURVEY 2015

EXECUTIVE SUMMARY

A survey of 13 sites on the West Penwith Moors was carried out in 2015 to assess Dartford warbler populations against criterion [3.2 Localities used by aggregations of breeding species](#) Chapter 17, Birds in the *Guidelines for the Selection of Biological SSSIs (JNCC 2015)*. A total of 72 observations of Probable or Confirmed behaviours in line with British Trust for Ornithology (BTO) breeding evidence codes were recorded over 39 site visits (3 per site). Analysis and mapping of these observations demonstrates there were 55 probable breeding pairs or territories in 2015.

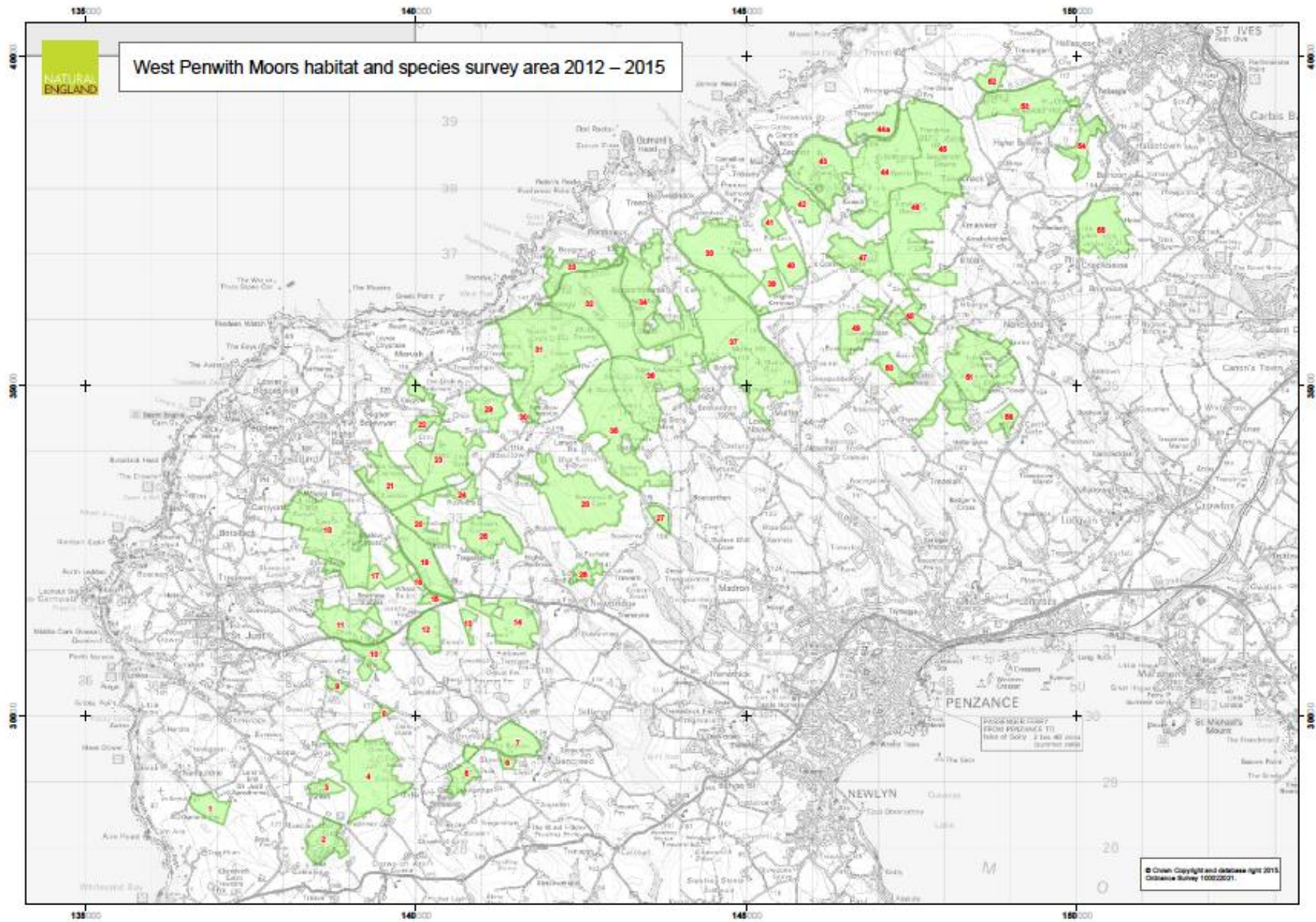
A survey of the same sites carried out in 2014 (Curtis *et al*: West Penwith Moors, Cornwall – Breeding Bird Survey 2014, Natural England) recorded an estimated 55 breeding pairs of Dartford warbler despite this survey not being specifically targeted at Dartford warbler populations.

The 1% threshold set out in Criterion 3.2 is 32 pairs (national total is estimated to be 3,200 pairs). The West Penwith sites have significantly exceeded this on two consecutive breeding seasons. Consequently it is recommended that any notification as SSSI should include the Dartford warbler population as a “feature of interest”.

INTRODUCTION

Natural England is gathering evidence 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). Habitat and specialist species surveys are being commissioned within the overall area shown in Map 1.

Map 1. Areas of West Penwith Moors included in habitat and species surveys



BACKGROUND INFORMATION

A breeding bird survey carried out in 2014 (Curtis *et al.* 2014) found that the number of breeding Dartford warbler occurring in the West Penwith Moors survey area exceeds 1% of the GB population. Consequently Dartford warbler appears to meet criterion [3.2 Localities used by aggregations of breeding species](#), Chapter 17 Birds in the Guidelines for the Selection of Biological SSSIs (JNCC 2015).

However, the criterion requires that the breeding population normally or regularly meets or exceeds the 1% threshold. The survey data currently available for Dartford warbler is derived from one year's field survey only. Historical data (Crummay 2013 and Wotton *et al.* 2009) suggests that the breeding population was previously well below the qualifying threshold, or, in the case of the 2006 national survey, non-existent. Therefore, the existing survey and historical data was not considered sufficient to support the case for the notification of Dartford warbler as a SSSI feature of interest because 'regular use' cannot be demonstrated. The accepted approach is that 'regular use' can be demonstrated if the threshold number of birds is met or exceeded in two out of three breeding seasons, based on the selection criteria for Ramsar sites. As a result, Natural England commissioned a further survey to target the Dartford Warbler population.

FIELD WORK

The requirement was to undertake a survey in 2015 to assess the breeding population of Dartford warbler in the West Penwith Moors survey area. The objective being to determine whether the breeding population in 2015 meets or exceeds 1% of the GB population. It was not a requirement of this survey to map breeding territories but to identify the number and location of probable and confirmed breeding Dartford Warblers as defined by the BTO breeding evidence codes shown below:

BTO breeding evidence codes

Non-breeding

- F** Flying over.
- M** Species observed but suspected to be still on **M**igration.
- U** Species observed but suspected to be s**U**mmerring non-breeder.

Possible breeder

- H** Species observed in breeding season in suitable nesting **H**abitat.
- S** **S**inging male present (or breeding calls heard) in breeding season in suitable breeding habitat.

Probable breeding

- P** **P**air observed in suitable nesting habitat in breeding season.
- T** **T**erritory presumed through registration of territorial behaviour (song etc) on at least two different days a week or more part at the same place or many individuals on one day.

- D** Courtship and **D**isplay (judged to be in or near potential breeding habitat; be cautious with wildfowl).
- N** Visiting probable **N**est site.
- A** **A**gitated behaviour or anxiety calls from adults, suggesting probable presence of nest or young nearby.
- I** Brood patch on adult examined in the hand, suggesting **I**ncubation.
- B** Nest **B**uilding or excavating nest-hole.

Confirmed breeding

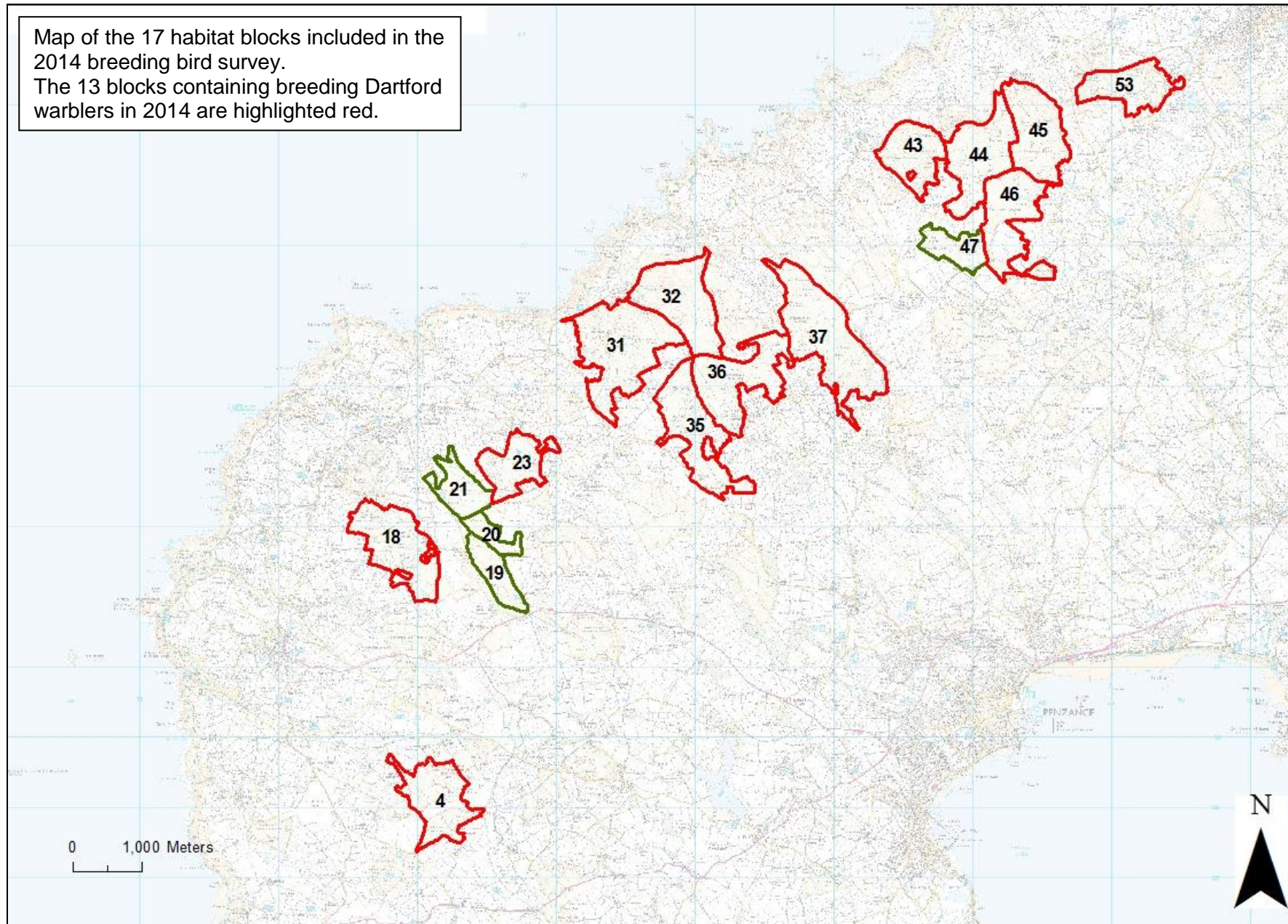
- DD** **D**istractio**D**isplay or injury feigning.
- UN** **U**sed **N**est or eggshells found (occupied or laid within period of survey).
- FL** Recently **F**ledged young (nidicolous species) or downy young (nidifugous species). Careful consideration should be given to the likely provenance of any 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 **O**ccupied **N**est (including high nests or nest holes, the contents of which cannot be seen) or adults seen incubating.
- FF** Adult carrying **F**aecal sac or **F**ood for young.
- NE** **N**est containing **E**ggs.
- NY** **N**est with **Y**oung seen or heard.

The results of the 2014 survey informed the targeting of the 2015 survey. The transects for the 2015 survey targeted suitable habitat for breeding Dartford warblers at the sites listed below and shown in Map 2 where probable and / or confirmed breeding Dartford warblers were recorded in 2014.

Table 1: Site names and numbers holding Dartford warbler populations in 2014

Site number	Site name	Number of territories in 2014
4	Bartinney Downs, Tredinney Common and Numphra Common	2
18	Carnyorth Common to Bostraze Bog	3
23	Higher Downs and Chun Downs	4
31	Watch Croft, Trevean, White Downs and Bosullow Common	4
32	Carn Galver	7
35	Men-an-Tol Croft, Lanyon Croft and Bosilliack	6
36	Nine Maidens Common	3
37	Mulfra Hill to Treen Common	1
43	Zennor Hill and Rosemorran	2
44	Foage Farm to Sperris Croft and Boscubben Croft	8
45	Trendrine Hill and Beagletodn Downs	12
46	Amalveor Downs to Noon Billas	1
53	Rosewall Hill	2

Map 2. Dartford warbler survey areas based on observations from the 2014 breeding bird survey



The survey methodology was based on that described in [Bird Monitoring Methods – Dartford warbler](#) (Gilbert *et al* 1998). Three visits per site were carried out from about one hour after dawn as follows:

1. from the beginning of April to mid-May,
2. between mid-May and late May, and,
3. in June.

Habitat considerations and disturbance were taken into account in planning survey transects. Visits were carried out in suitable weather conditions, on fine, calm days and avoiding cold, windy and rainy conditions.

West Penwith has a significantly maritime climate with weather strongly influenced by frequent moist, south westerly or westerly airstreams. There were several periods when weather conditions for surveying did not meet the criteria, being either too wet, too windy or when thick mist prevailed. Unsuitable weather conditions affected both the first and second visit periods and hence caused a slight delay for the final visits

Surveys started on 13th April 2015 and, due to weather conditions, were completed by 9th July 2015. Given that there were periods of cold, wet and windy weather it is reasonable to assume that this may have influenced breeding behaviour of Dartford warblers. Consequently survey visits taking place beyond the end of June by 9 days are not likely to have compromised results and may well have accommodated delays in breeding behaviours due to the weather conditions.

Geotagged photographs were taken of all observations on the 3rd visit to each site to give representative samples of habitat types being used by Dartford warblers.

Observations were recorded using a Garmin GPS MAP62Sc handheld GPS unit which has an on board camera used for taking the photographs on the 3rd visits. Observations were stored as a 10 figure OS Grid References and given a unique reference number.

Observations are numbered and labeled with a unique reference as follows:

Site no.	Visit no.	Observation no:	Day-	Month-	Year
43	1	2	23	4	15

Thus observation 43.1.2:23-4-15 is Site 43, visit 1, observation 2 on 23rd April 2015.

RESULTS AND ANALYSIS OF DATA

Site notes and observations for each site are shown in Appendix 1 together with a description of habitat.

Careful examination of the mapping of observations against the guidance given in [Bird Monitoring Methods – Dartford warbler](#) (Gilbert *et al* 1998) was carried out to determine where combinations or grouping of several observations were considered to represent a single territory. This produces a total of 55 probable and confirmed Dartford warbler territories (pairs).

As part of this examination, double counting of observations close to boundaries of survey areas has been excluded, for example, observations 44.2.2:7-6-15 FL and 45.2.4:9-6-15 FF have only been counted as one territory on Site 44.

Table 2: Summary of all observations after analysis

SITE	TOTAL OBSERVATIONS	No. OF TERRITORIES
Site 4	5	4
Site 18	5	3
Site 23	4	3
Site 31	10	7
Site 32	9	7
Site 35	5	4
Site 36	4	3
Site 37	3	2
Site 43	4	3
Site 44	6	6
Site 45	13	8
Site 46	3	2
Site 53	5	3
TOTAL	72	55

DISCUSSION AND SOME OBSERVATIONS ON MANAGEMENT

In Britain, Dartford warblers are almost exclusively found on lowland dry heathland with Heather *Calluna vulgaris* and Gorse *Ulex* spp. Large areas of heathland typically hold higher densities of breeding birds than fragmented and isolated habitats, with up to 10-15 pairs/km² present in the best areas. Territories containing Gorse, *Ulex* spp. tend to be more productive (Catchpole & Phillips 1992), most likely due to the greater abundance of invertebrate prey and increased shelter during the winter. Given this, survey efforts were targeted to the most suitable habitat. For example, on Site 32 there are extensive areas of acid grassland dominated by Purple moor-grass *Molinia caerulea* as well as large areas dominated by *Ulex* spp. and ericaceous shrubs. Transects on this site were concentrated to avoid the less suitable habitat and focus on the *Ulex* and ericaceous dominated habitat.

An important note is that on several sites, management work is ongoing and significant blocks of *Ulex* dominated habitat had been burnt as a precursor to grazing. Transects were not targeted to areas where Gorse had been recently burnt as they no longer represent the most suitable habitat. Sites 32 and 35

are both examples of where Dartford warbler territories recorded in 2014 were removed by burning activity. It is recommended that, in the future, careful consideration is given to the location and scale of burning to minimise the impact on the breeding population whilst, at the same time, maintaining a suitable mosaic of habitat to provide optimum conditions for Dartford warbler populations to continue to thrive and expand.



Typical Dartford warbler habitat, site 45 Trendrine Hill and Beagletodn Downs.
Photograph taken on third visit, 27-06-2015, SH Crummay.

High levels of recreational disturbance have been shown to cause a significant reduction in breeding productivity in heather-dominated Dartford warbler territories, by decreasing both the number of successful broods raised and the number of chicks fledged by each breeding pair. (Murison *et al*, 2007).

Site 18 is one of the most heavily used and impacted by human disturbance as well as having substantial areas of ericaceous habitat alongside *Ulex* dominated areas. Transects were targeted at the most suitable habitat areas and also to avoid the most disturbed areas to ensure the best recording effort. However, as shown in the summary Table 2 above, despite having good habitat, Site 18 only holds 3 territories. This appears to be consistent with research at other sites in the UK which suggests that disturbance is a limiting factor (Murison *et al* 2007). Future management should be targeted carefully at maintaining and improving habitats for Dartford warblers away from areas that suffer from the greatest disturbance to help create the best possible conditions for Dartford warbler populations to thrive.

It is recommended that the results and evidence from this survey and the Dartford warbler records from the 2014 breeding bird survey are used to inform land management discussions and decisions.

CONCLUSION

Assessment against JNCC Criterion 3.2

Criterion descriptor

Localities which regularly support 1% or more of the total British breeding population of any native species and seabird colonies of over 10,000 breeding pairs will qualify for SSSI selection. In practice, this criterion often covers colonial species (for example seabirds and herons and egrets), semi-colonial species (for example some grebes, ducks and waders) and rare species.

Threshold population

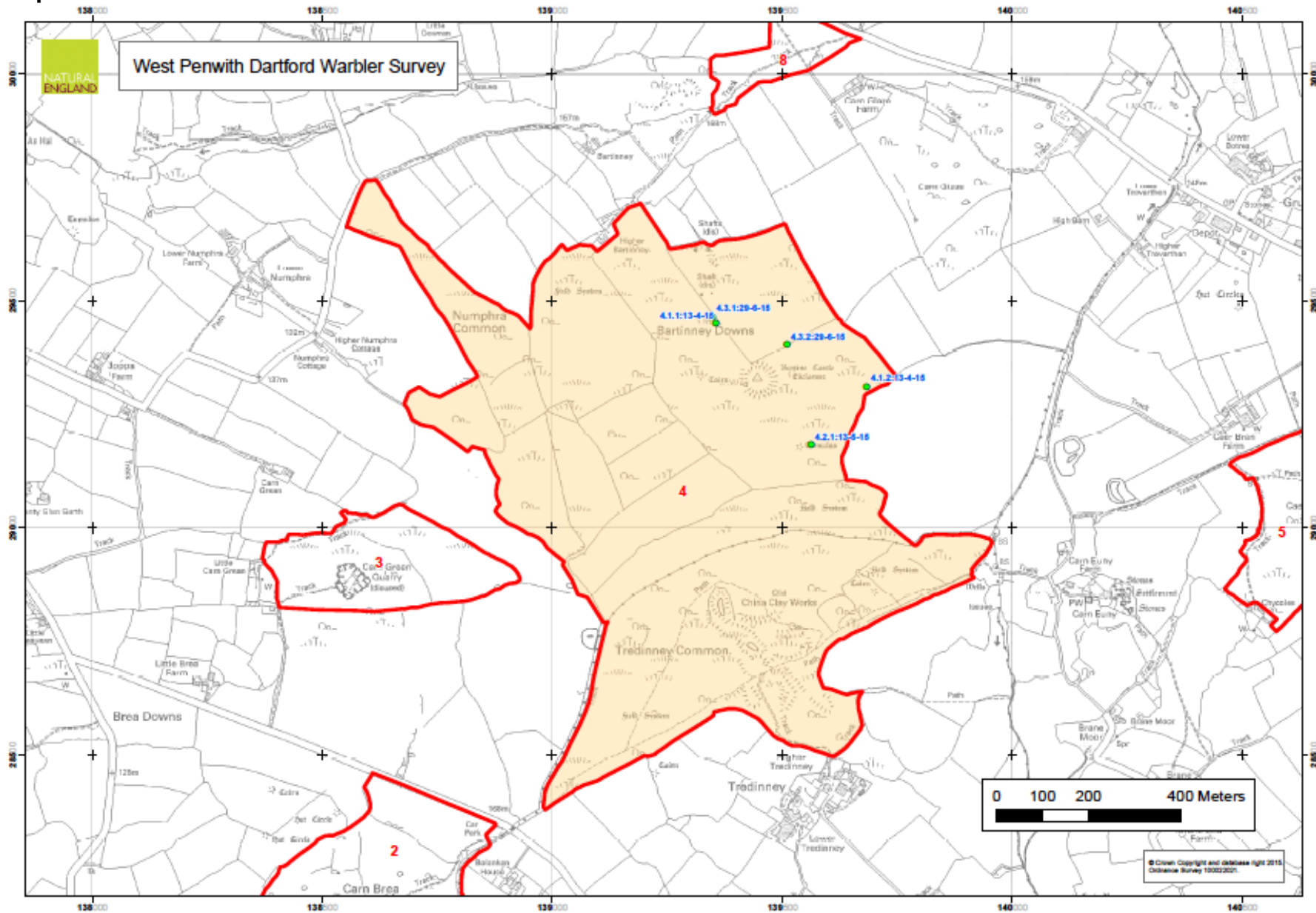
Population estimates of the British breeding population of Dartford warbler are given in Musgrove *et al.* (2013) as 3,200 pairs. Thus the qualifying threshold of 1% is 32 pairs.

From Table 2, the West Penwith Moors Dartford warbler population exceeds the threshold and it is recommended that the population and should be considered for inclusion as a feature of interest in any notification of the sites as a Site of Special Scientific Interest.

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Map of Site 4 Observations



Site 18
Carnyorth Common to Bostraze Bog

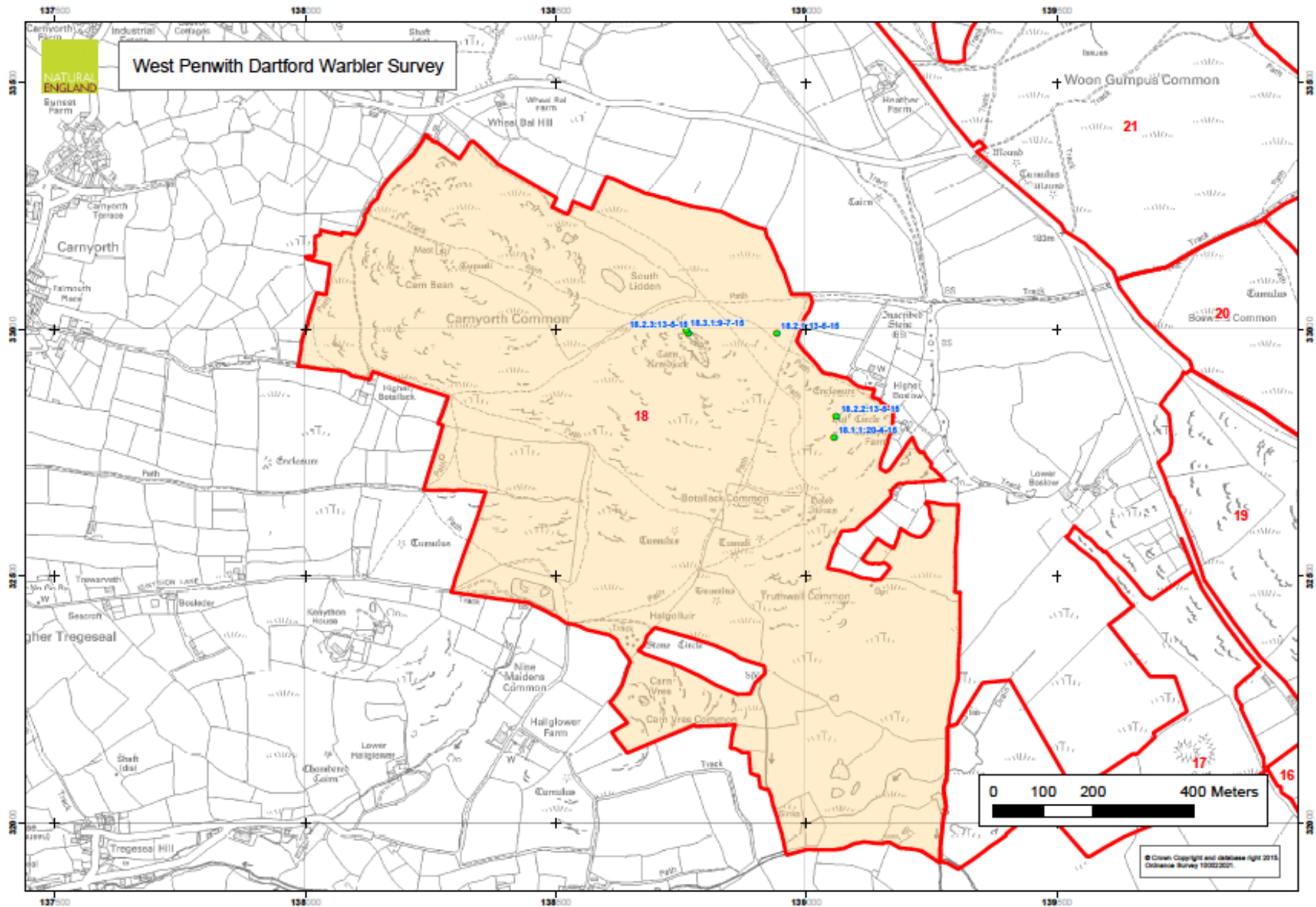
Grid Reference: SW 387275

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.

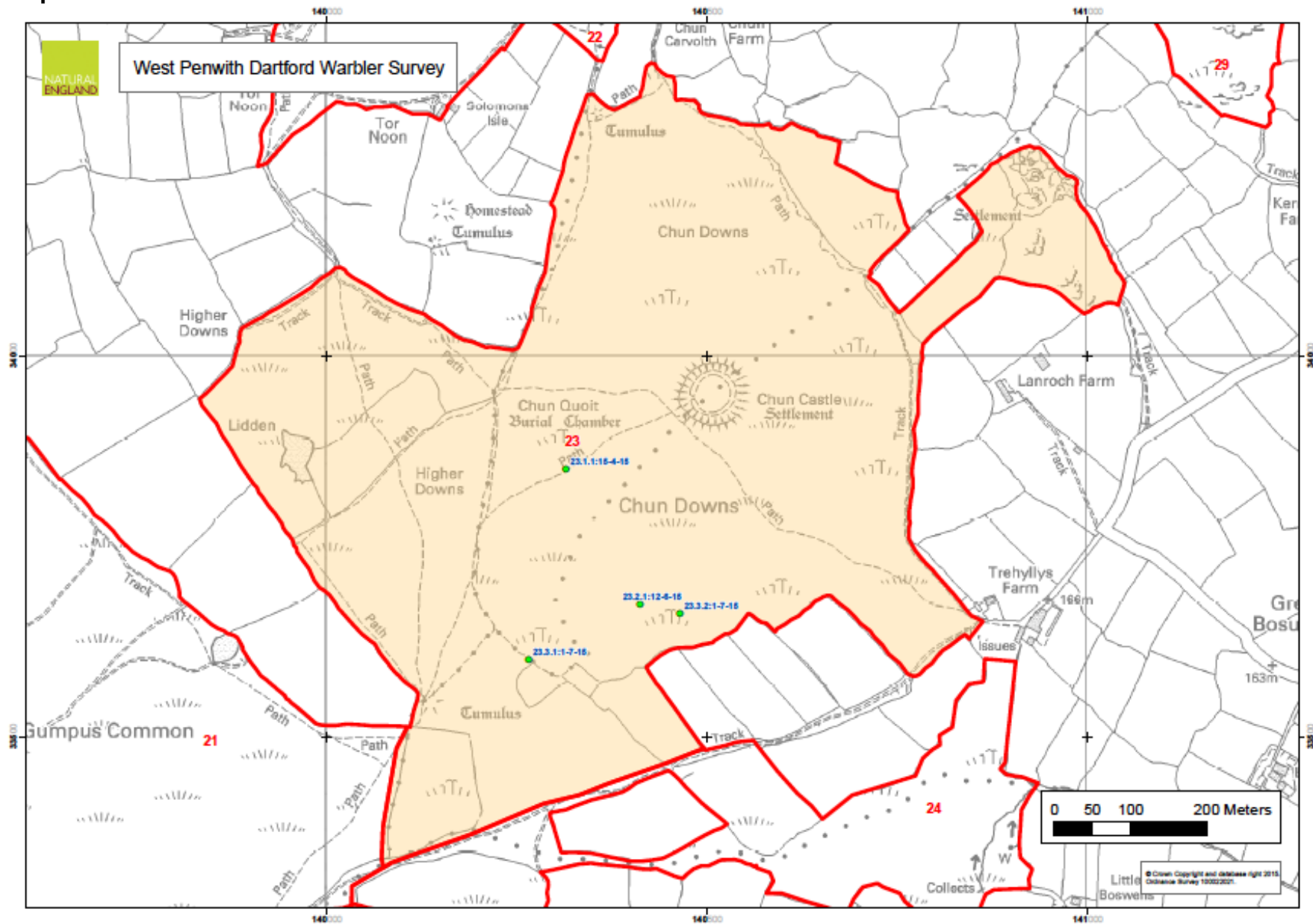
Estimated visual coverage: 95%. The majority of this site was relatively easy to survey, with a good network of paths. However some habitat was very dense and survey was difficult but all suitable habitat was covered. Areas of unsuitable boggy habitat were excluded from the survey effort.

SITE 18	Waypoint GR		Probable breeding							Confirmed breeding							
	Waypt No	x	y	P	T	D	N	A	I	B	DD	UN	FL	ON	FF	NE	NY
18.1.1:20-4-15	139055	32781		X													
18.2.1:13-5-15	138940	32992	X														
18.2.2:13-5-15	139060	32822						X									
18.2.3:13-5-15	138765	32994	X														
18.3.1:9-7-15	138760	32997													X		

Map of Site 18 Observations



Map of Site 23 Observations



Site 31**Watch Croft, Trevean, White Downs and Bosullow Common**

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.

SITE 31 Waypt No	Waypoint GR		Probable breeding							Confirmed breeding						
	X	y	P	T	D	N	A	I	B	DD	UN	FL	ON	FF	NE	NY
31.1.1:1-5-15	142195	35864		X												
31.1.2:1-5-15	142548	35866		X												
31.1.3:1-5-15	142074	35117		X												
31.1.4:1-5-15	142556	35656	X													
31.2.1:6-6-15	142148	35310												X		
31.2.2:6-6-15	142505	35750					X									
31.2.3:6-6-15	142403	35825												X		
31.2.4:6-6-15	141940	35885				X										
31.2.5:6-6-15	141861	35833												X		
31.3.1:5-7-15	141770	35931										X				
31.3.2:5-7-15	142353	35867										X				
31.3.3:5-7-15	142552	35879										X				
31.3.4:5-7-15	142559	35698												X		

Site 32
Carn Galver

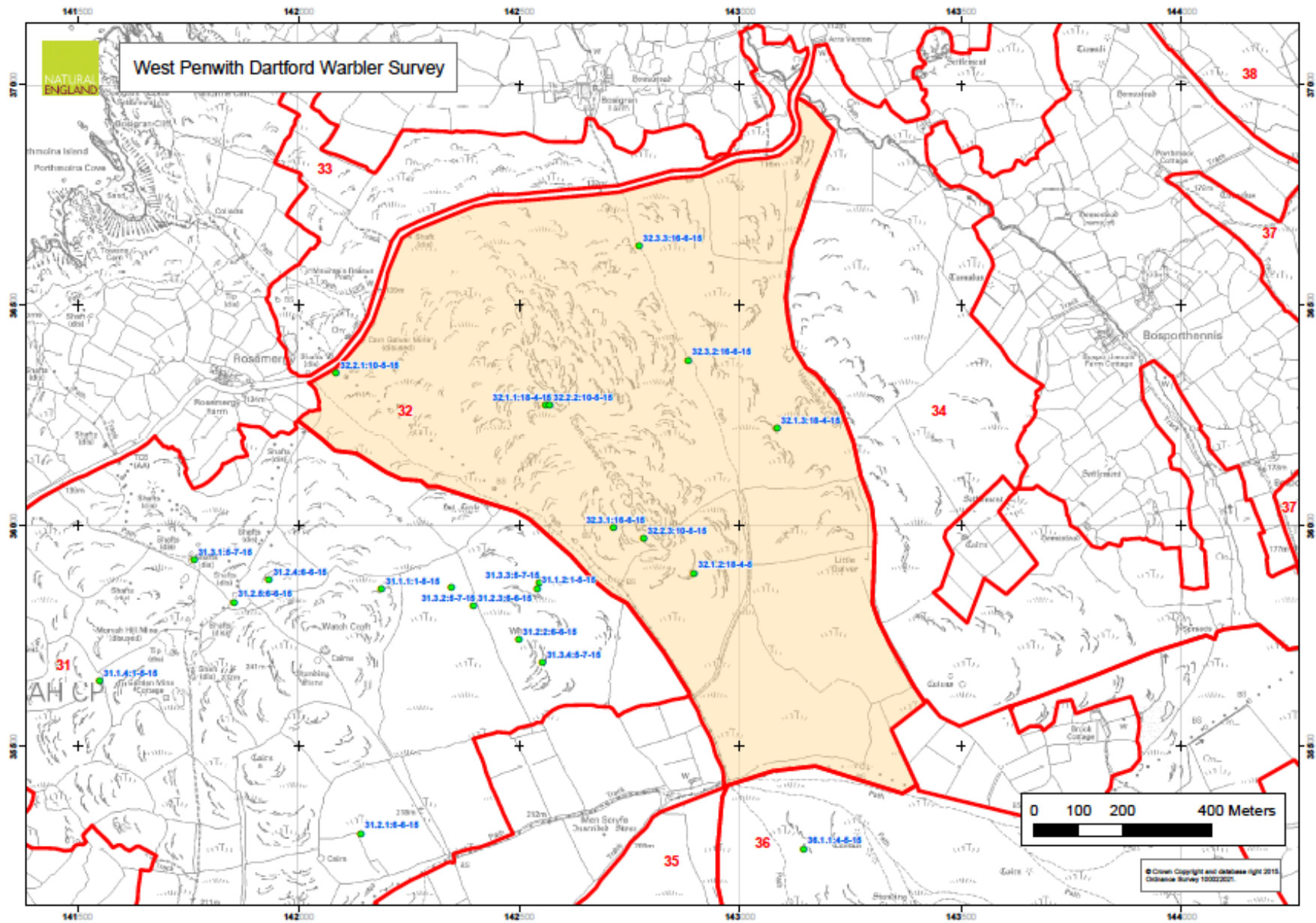
Grid Reference: SW 429362

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.

SITE 32	Waypoint GR		Probable breeding							Confirmed breeding							
	Waypt No	x	y	P	T	D	N	A	I	B	DD	UN	FL	ON	FF	NE	NY
32.1.1:18-4-15	142566	36282		X													
32.1.2:18-4-15	142902	35900					X										
32.1.3:18-4-15	143090	36228								X							
32.2.1:10-5-15	142092	36353	X														
32.2.2:10-5-15	142575	36280		X													
32.2.3:10-5-15	142787	35978				X											
32.3.1:16-6-15	142719	36003										X					
32.3.2:16-6-15	142888	36383												X			
32.3.3:16-6-15	142777	36641												X			

Map of Site 32 Observations



Site 35
Men-an-Tol Croft, Lanyon Croft and Bosilliack

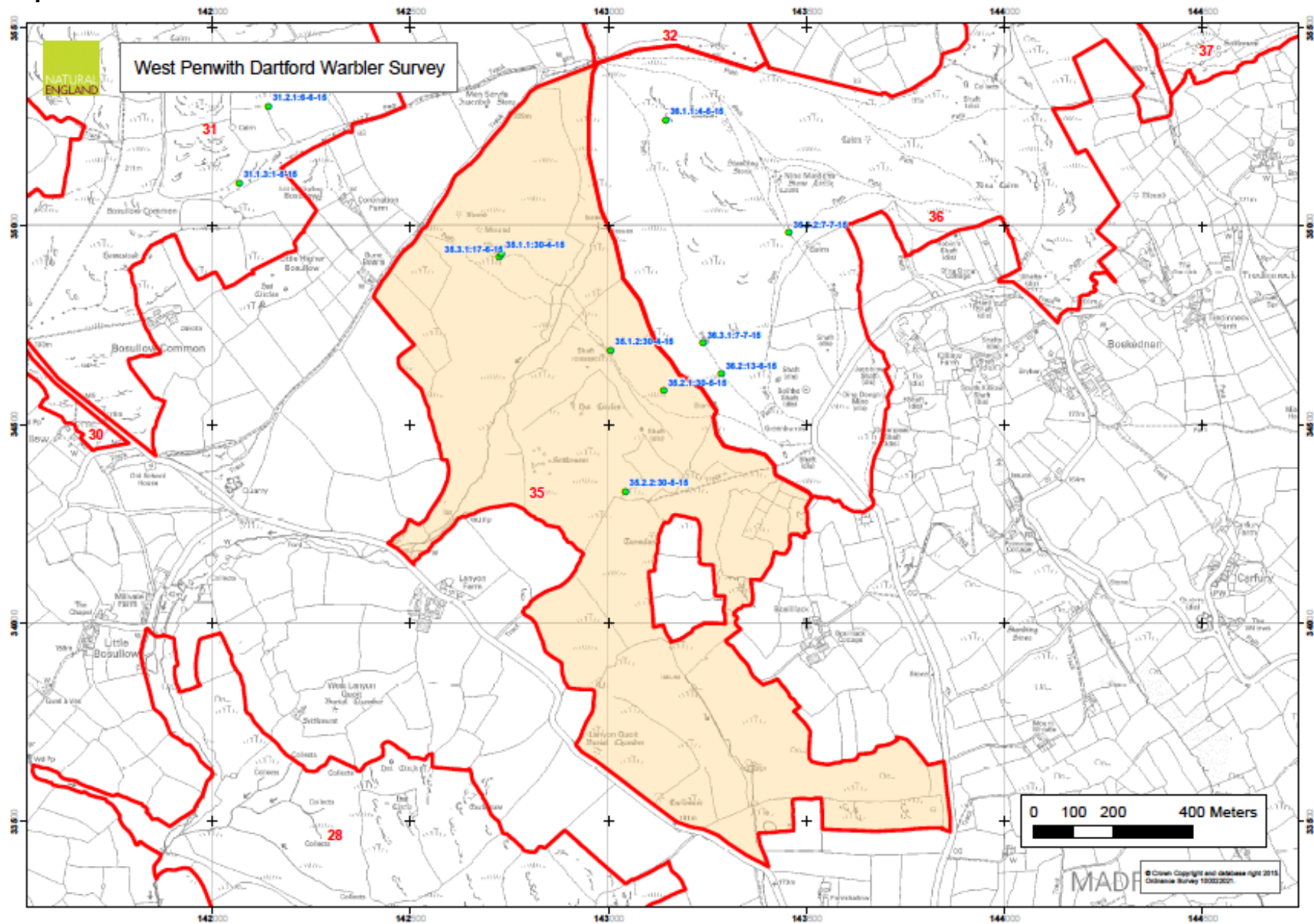
Grid Reference: SW 430343

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.

SITE 35	Waypoint GR		Probable breeding							Confirmed breeding							
	Waypt No	x	y	P	T	D	N	A	I	B	DD	UN	FL	ON	FF	NE	NY
35.1.1:30-4-15	142736	34939				X											
35.1.2:30-4-15	143012	34694		X													
35.2.1:30-5-15	143146	34594	X														
35.2.2:30-5-15	143049	34339												X			
35.3.1:17-6-15	142731	34929												X			

Map of Site 35 Observations



Site 36
Nine Maidens Common

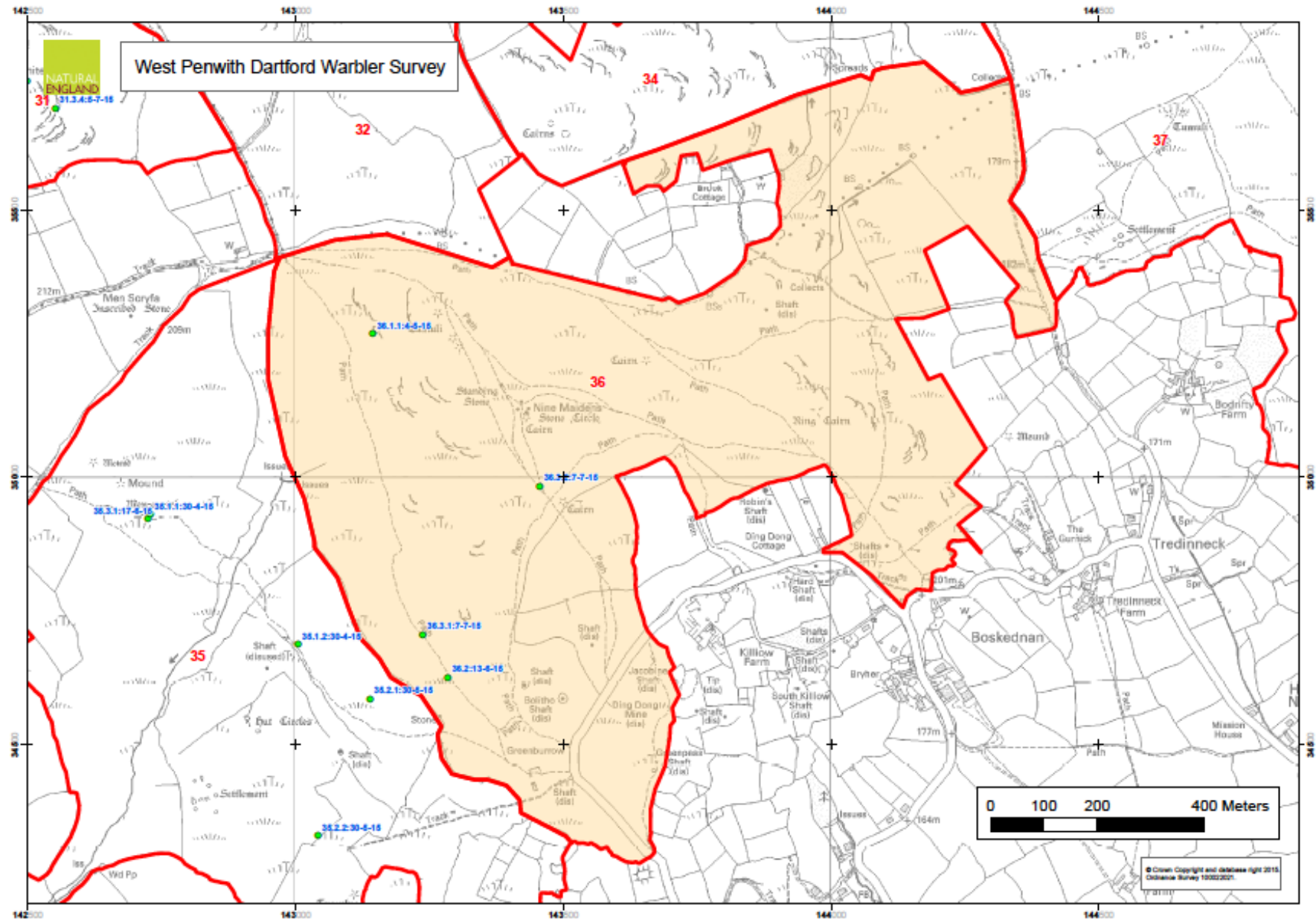
Grid Reference: SW 436351

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.

SITE 36	Waypoint GR		Probable breeding							Confirmed breeding							
	Waypt No	x	y	P	T	D	N	A	I	B	DD	UN	FL	ON	FF	NE	NY
	36.1.1:4-5-15	143151	35275		X												
	36.2.1:13-6-15	143291	34635				X										
	36.3.1:7-7-15	143245	34714										X				
	36.3.2:7-7-15	143462	34991												X		

Map of Site 36 Observations



Site 37
Mulfra Hill to Treen Common

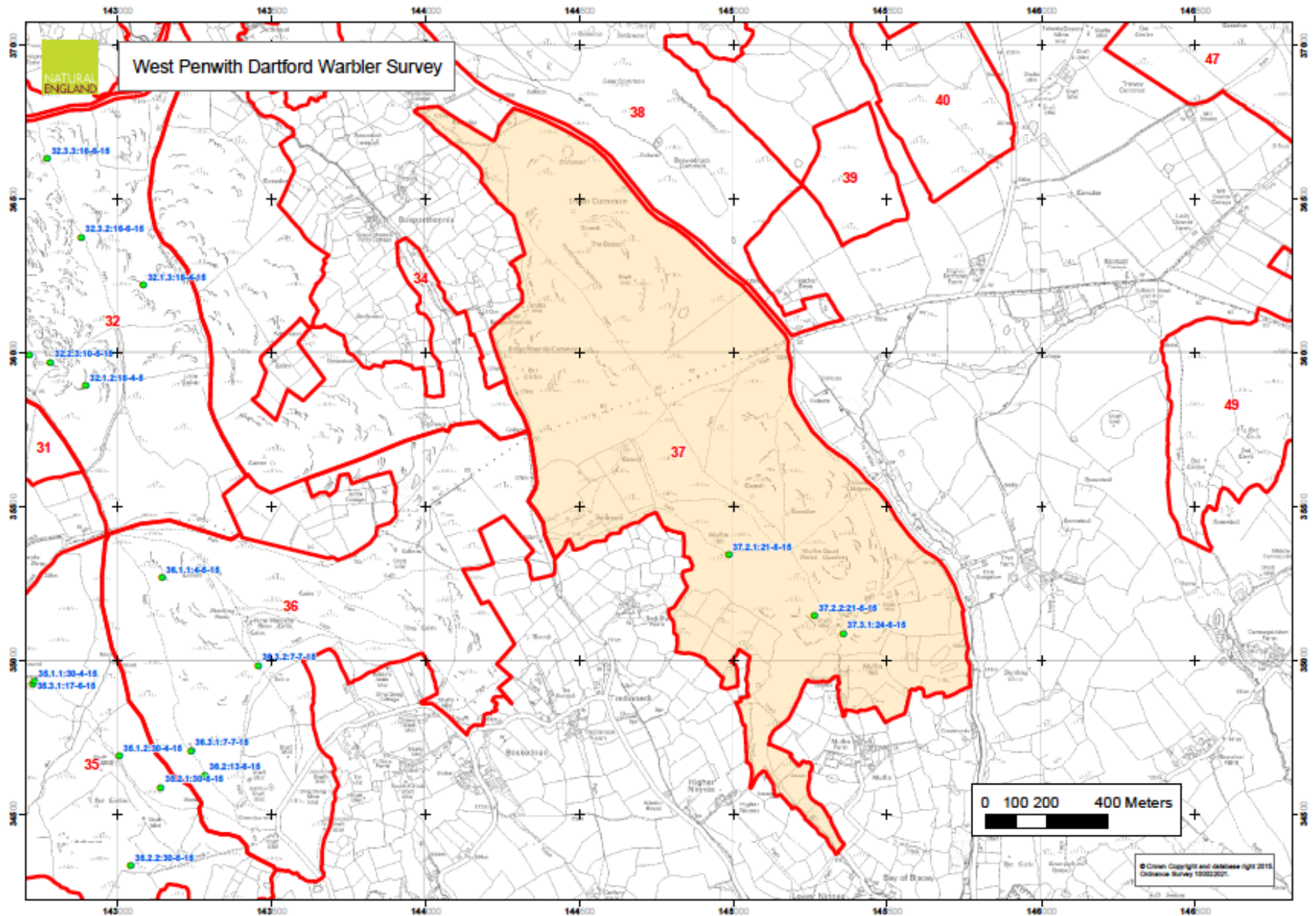
Grid Reference: SW 452354

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.

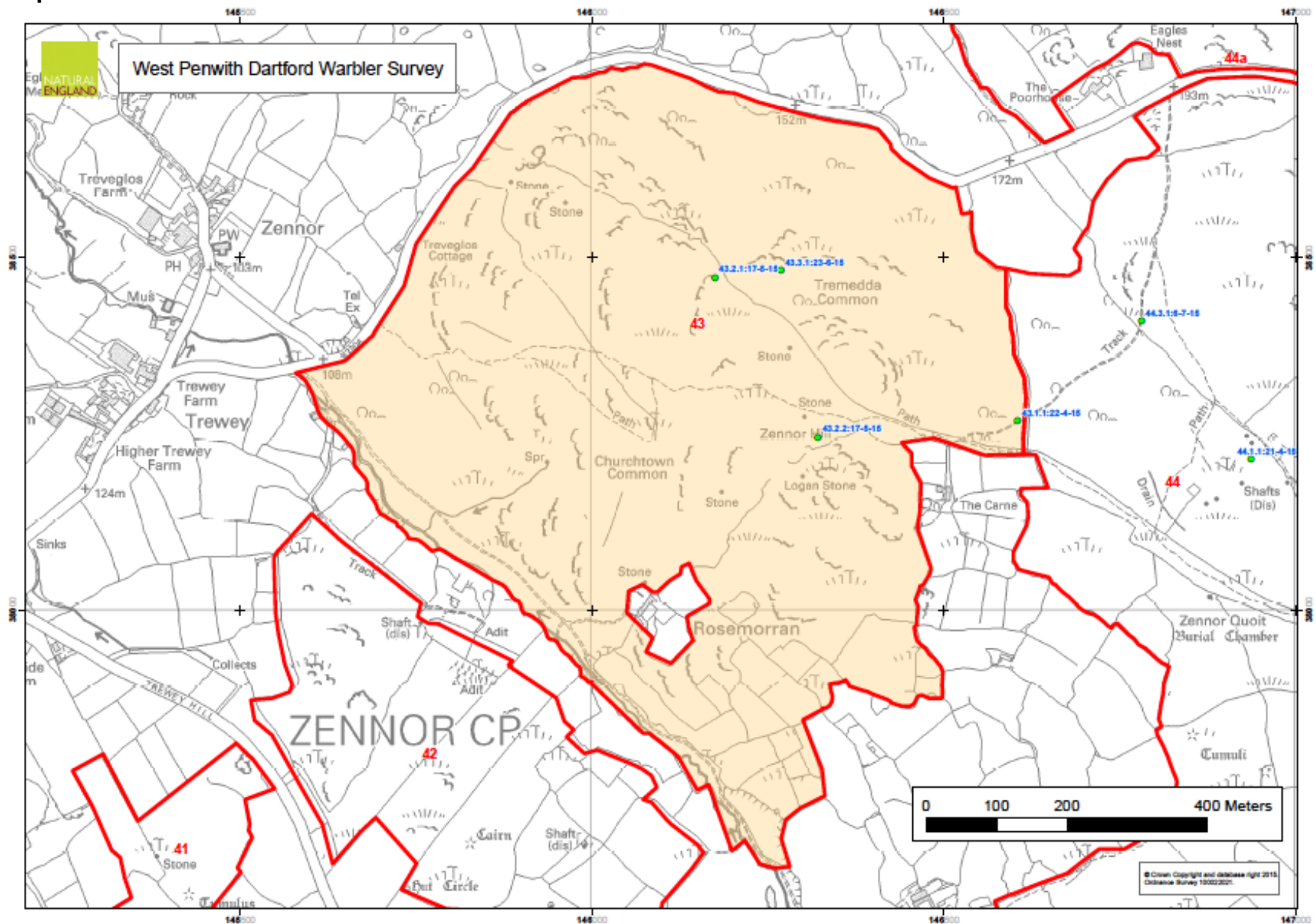
Estimated visual coverage: 90%: Only the southern half of this site was surveyed, and there was no access to the south eastern corner. The remainder was predominantly easy to survey, with some good paths but very dense areas of vegetation made some areas more challenging. However, topography allows good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

SITE 37	Waypoint GR		Probable breeding							Confirmed breeding							
	Waypt No	x	y	P	T	D	N	A	I	B	DD	UN	FL	ON	FF	NE	NY
37.2.1:21-5-15	144990	35350					X										
37.2.2:21-5-15	145270	35153	X														
37.3.1:24-6-15	145363	35096											X				

Map of Site 37 Observations



Map of Site 43 Observations



Site 44**Foage Farm to Sperris Croft and Boscubben Croft**

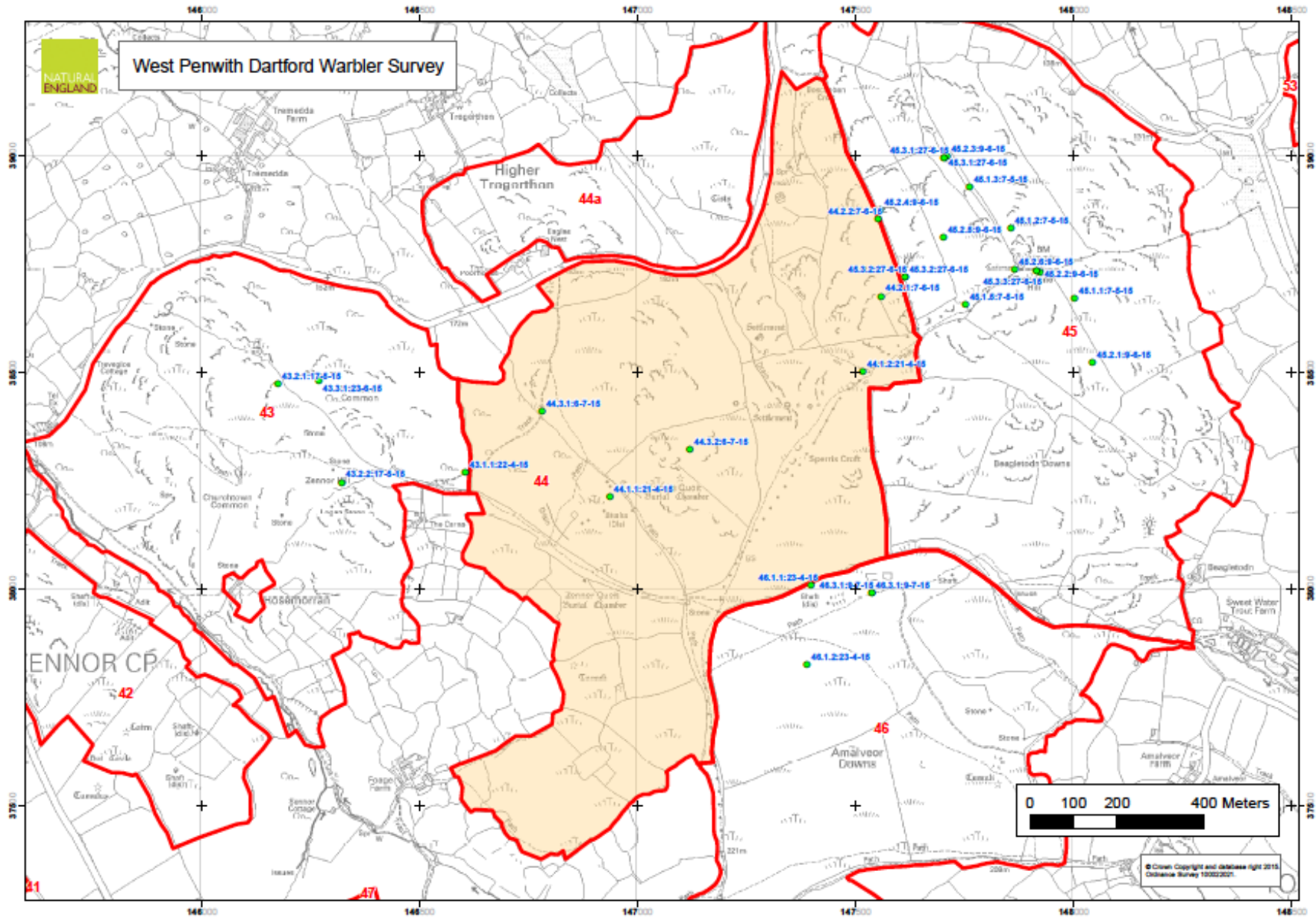
Grid Reference: SW 470825

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 accessing suitable habitats.

SITE 44 Waypt No	Waypoint GR		Probable breeding							Confirmed breeding						
	x	y	P	T	D	N	A	I	B	DD	UN	FL	ON	FF	NE	NY
44.1.1:21-4-14	146943	38220		X												
44.1.2:21-4-15	147523	38509	X													
44.2.1:7-6-15	147566	38682	X													
44.2.2:7-6-15	147558	38860										X				
44.3.1:6-7-15	146787	38418										X				
44.3.2:6-7-15	147127	38329										X				

Map of Site 44 Observations



Site 45
Trendrine Hill and Beagletodn Downs

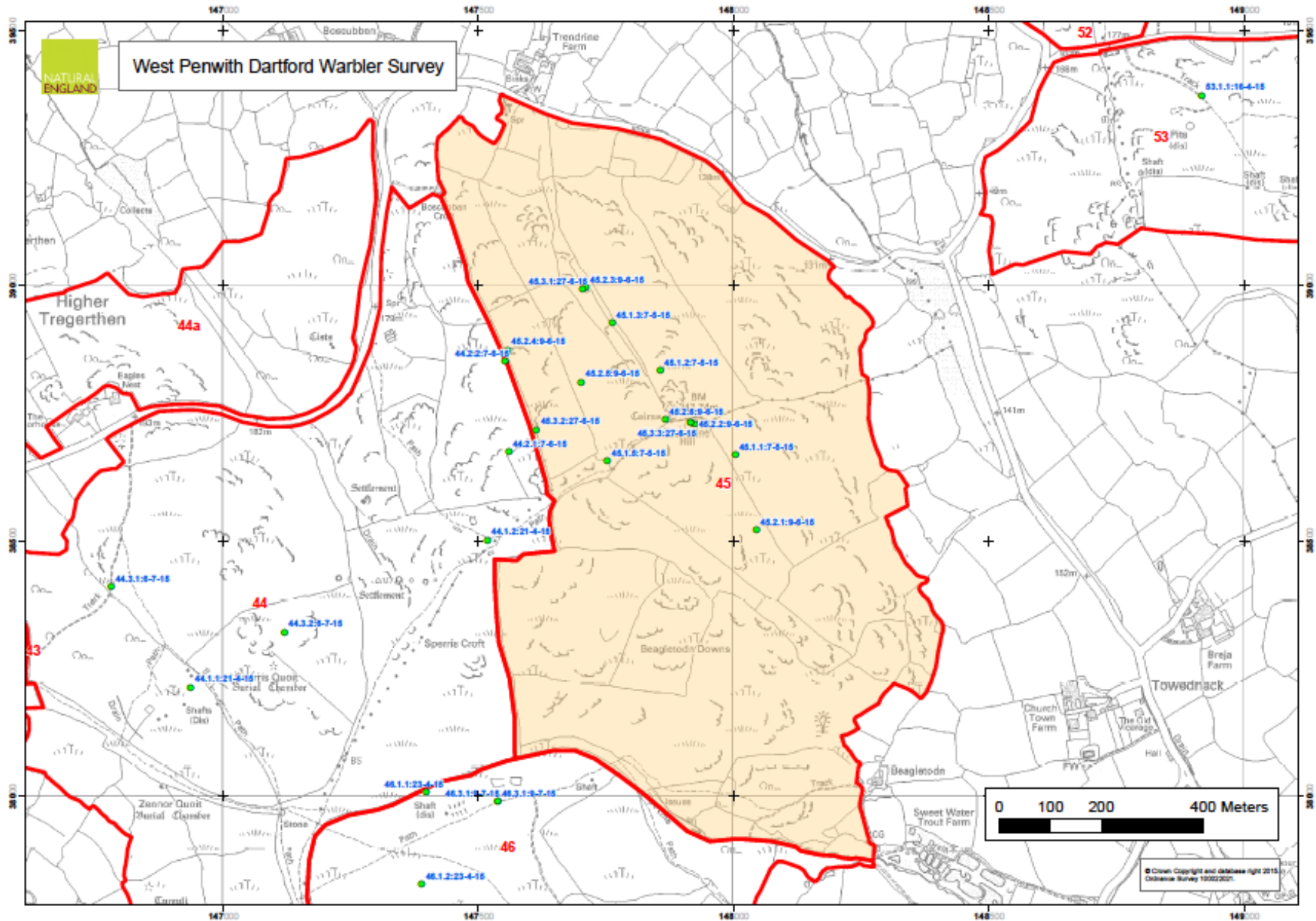
Grid Reference: SW 480853

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.

SITE 45 Waypt No	Waypoint GR		Probable breeding							Confirmed breeding						
	x	y	P	T	D	N	A	I	B	DD	UN	FL	ON	FF	NE	NY
45.1.1:7-5-15	148009	38676		X												
45.1.2:7-5-15	147862	38840		X												
45.1.3:7-5-15	147768	38934	X													
45.1.5:7-5-15	147759	38663				X										
45.2.1:9-6-15	148050	38530				X										
45.2.2:9-6-15	147930	38737												X		
45.2.3:9-6-15	147716	39004	X													
45.2.4:9-6-15	147563	38881												X		
45.2.5:9-6-15	147708	38819										X				
45.2.6:9-6-15	147872	38745	X													
45.3.1:27-6-15	147710	39000										X				
45.3.2:27-6-15	147620	38725										X				
45.3.3:27-6-15	147921	38740												X		

Map of Site 45 Observations



Site 46**Amalveor Downs to Noon Billas**

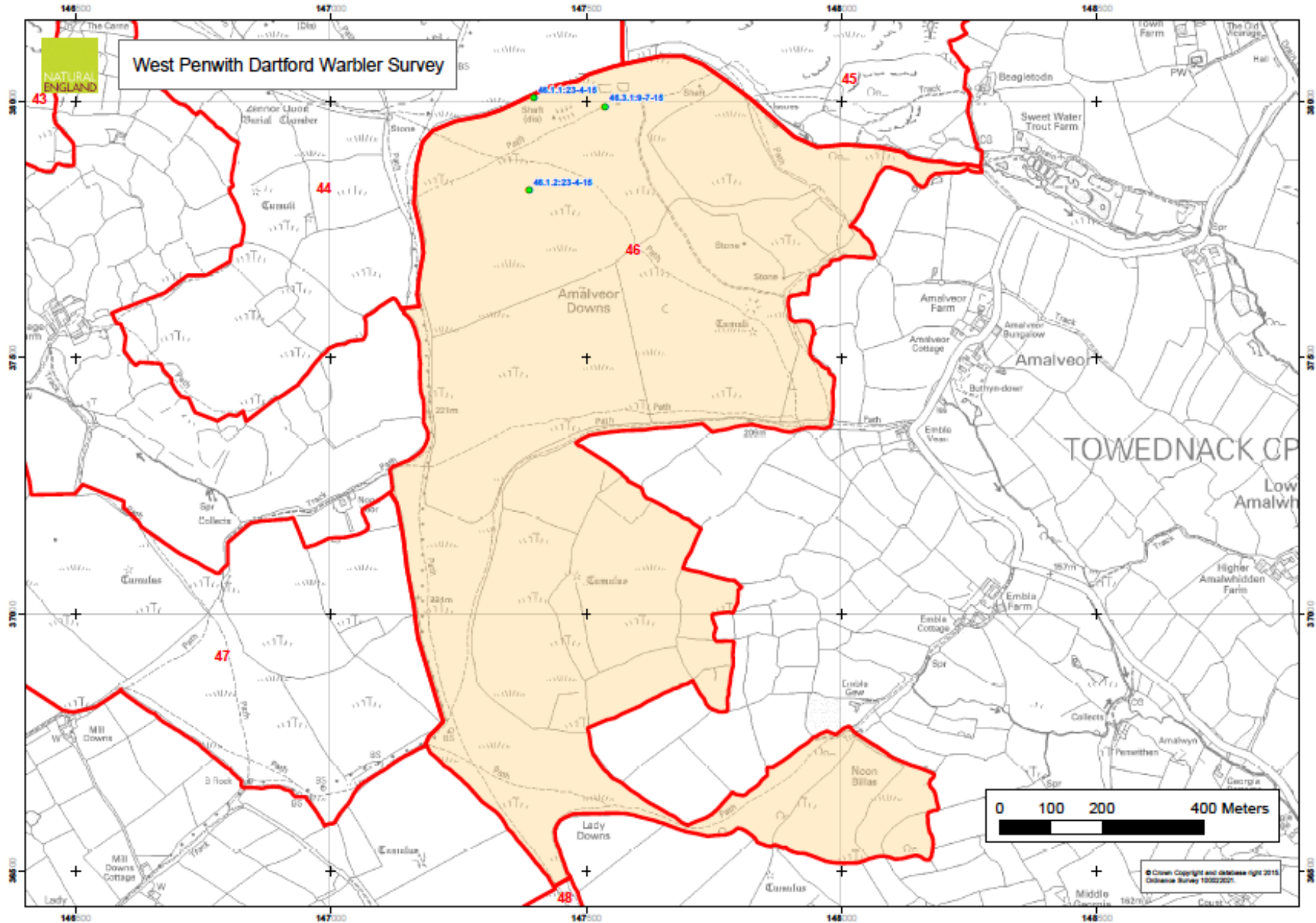
Grid Reference: SW 475751

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 providing access to the suitable habitat areas since only the northern part of this site is included in this survey.

SITE 46	Waypoint GR		Probable breeding							Confirmed breeding							
	Waypt No	x	y	P	T	D	N	A	I	B	DD	UN	FL	ON	FF	NE	NY
46.1.1:23-4-15	147404	38015		X													
46.1.2:23-4-15	147395	37834		X													
46.3.1:9-7-15	147544	37998												X			

Map of Site 46 Observations



Site 53
Rosewall Hill

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 mix of scrub and woodland with clearings containing large amounts of bracken.

Estimated visual coverage: 90%: 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 more difficult 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.

SITE 53	Waypoint GR		Probable breeding							Confirmed breeding							
	Waypt No	x	y	P	T	D	N	A	I	B	DD	UN	FL	ON	FF	NE	NY
53.1.1:16-4-15	148922	39380		X													
53.1.2:16-4-15	149326	39326		X													
53.2.1:15-5-15	149356	39321	X														
53.2.2:15-5-15	149244	39350	X														
53.3.1:19-6-15	149346	39344													X		

Map of Site 53 Observations

