

**Report on a Second Survey to Map the
Distribution of The Adder (*Vipera berus*)
Within the Quantock Hills AONB in
Somerset.
Spring 2012.**

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Introduction

In the spring of 2011, the Reptile and Amphibian Group for Somerset (RAGS) undertook a survey of adder (*Vipera berus*) populations in the Quantock Hills Area of Outstanding Natural Beauty (AONB) (Dickson 2011, unpublished report for Quantock Hills AONB Service).

Adders have long been thought to be uncommon on the Quantock hills, so the object of the survey was to map the distribution of assemblages of the species across the range of hills and to identify hibernation sites. During early spring, adders emerge from their hibernacula and spend the next few weeks basking in close proximity to the hibernacula. Consequently, observations of adders during the spring can indicate the likely position of hibernacula. Good hibernacula are of critical importance in the life-cycle of adders and significant numbers of individuals will often return to the same hibernaculum year after year. Therefore, knowing their location is crucial to the administration of management regimes sympathetic to the conservation of the species.

Palmer has been studying adders in the area on behalf of the Quantock AONB service since 2008. The RAGS surveys seek to support and expand on his work as a contribution toward the targets set out in the Quantock Hills Species Action Plan for adders published in 2011.

Prior to the 2011 survey by RAGS, Palmer had identified four subpopulations of adders within the AONB, one each at Thornecombe Hill, Wilmot's Pool, Black Hill and Great Hill (Palmer 2009). The RAGS survey confirmed the existence of these concentrations and provided additional data on the individuals within them; however, it also uncovered evidence of potential further assemblages in areas of the range that remain data deficient.

The 2012 survey aimed to build on that conducted during 2011. Once again, the object of the survey was to collect information on the local distribution and status of adders and in particular to identify further potential hibernation sites, this time focusing efforts on those areas that were identified in 2011 as likely to have additional assemblages.

A further objective of the 2012 survey was to identify the vegetation structure at basking sites used by adders. This is data that supports on-going work by Palmer into habitat use during thermoregulation by the species (Palmer 2011). This current report does not seek to analyse or discuss this data, which will no doubt be prepared and published in the future by Palmer.

Although much useful data was collected in the 2011 survey, there were some flaws in the protocol. There was further data that could possibly have contributed to a more detailed picture of adder populations on the Quantock range which was not collected. Consequently, the recording protocol for surveyors was amended for the 2012 survey (See Appendix 1).

Data collected during surveys can contribute directly to the conservation of the species by enabling sympathetic management techniques. It is thought that the burning of heather during the winter in hibernation areas might have a detrimental impact on emerging adders

during the spring when lack of vegetation may expose them to increased predation. As a result, the AONB Service is anxious to identify hibernation sites so that they can be taken into account when preparing swaling plans for the Higher Level Stewardship Programme. Additionally, the AONB Service will be able to use the data in an upcoming review of the statutory AONB Management plan due for publication in April 2014. Data also facilitates decision making by Natural England when drawing up management agreements with local landowners.

Materials and Methods

Methods used during the 2012 survey closely followed those adopted for the survey in 2011.

Twenty three surveyors were recruited in early spring, several of which, as returnees, had gained experience of surveying for adders during the previous year. The surveyors were divided into six groups and each group was allocated a 1Km square to survey (Table 1). Management of time was delegated to the groups themselves but each group was requested to complete a minimum of three visits to their allocated site before the survey ended on the 31st May.

Two training days were held, the first on the 17th March followed by a second on the 25th March for those unable to attend the first. Surveying began immediately following the first training day.

During the training days, surveyors were familiarised with reptile survey techniques and were instructed on collecting the relevant data to complete the survey form (Appendix 1). Additionally, each group was issued with a hand-held GPS system to record the grid reference of sightings.

During the previous year, each group had been allocated two 1Km squares. However, it was felt that as the amount of data to be collected had increased from the previous year, a single square might be more manageable for each group. Fortunately, as evident from Table 1, several groups were happy to take on two squares.

The selection of 1Km squares was based on leads that arose during surveys the previous year, indicating areas that may require further investigation. As can be seen from the map (Figure 1), squares for 2012 were concentrated on the northern and southern areas of the range where little data currently exists.

The surveying technique is very simple. Surveyors first need to identify potential adder sites within their 1Km square. During a period of suitable weather conditions, they then traverse the area quietly and methodically, searching for basking adders. Once an adder is found participants record its position using the GPS, identify its sex and life stage and record details of the vegetation structure around the basking site. Where possible a photograph is taken of the individual.

When the visit is completed, or perhaps whilst out in the field, the surveyors are requested to complete the recording form (Appendix 1). This gives details of the individual sightings and the vegetation structure, as well as the times of the visit and the number of surveyors present to allow an estimate of the man-hours expended per sighting.

Group No	1Km Square Grid Reference	Local Name
1	ST1734	Lydeard Hill
1	ST1735	Aisholt Common
2	ST1240	Weacombe Hill to Beacon Hill
3	ST1241	West Quantoxhead
4	ST1635	Wills Neck to Triscombe Stone
5	ST1140	Weacombe Hill West
6	ST1141	Vinny Combe
6	ST1242	West Hill

TABLE 1: Allocation of 1Km squares to survey groups.

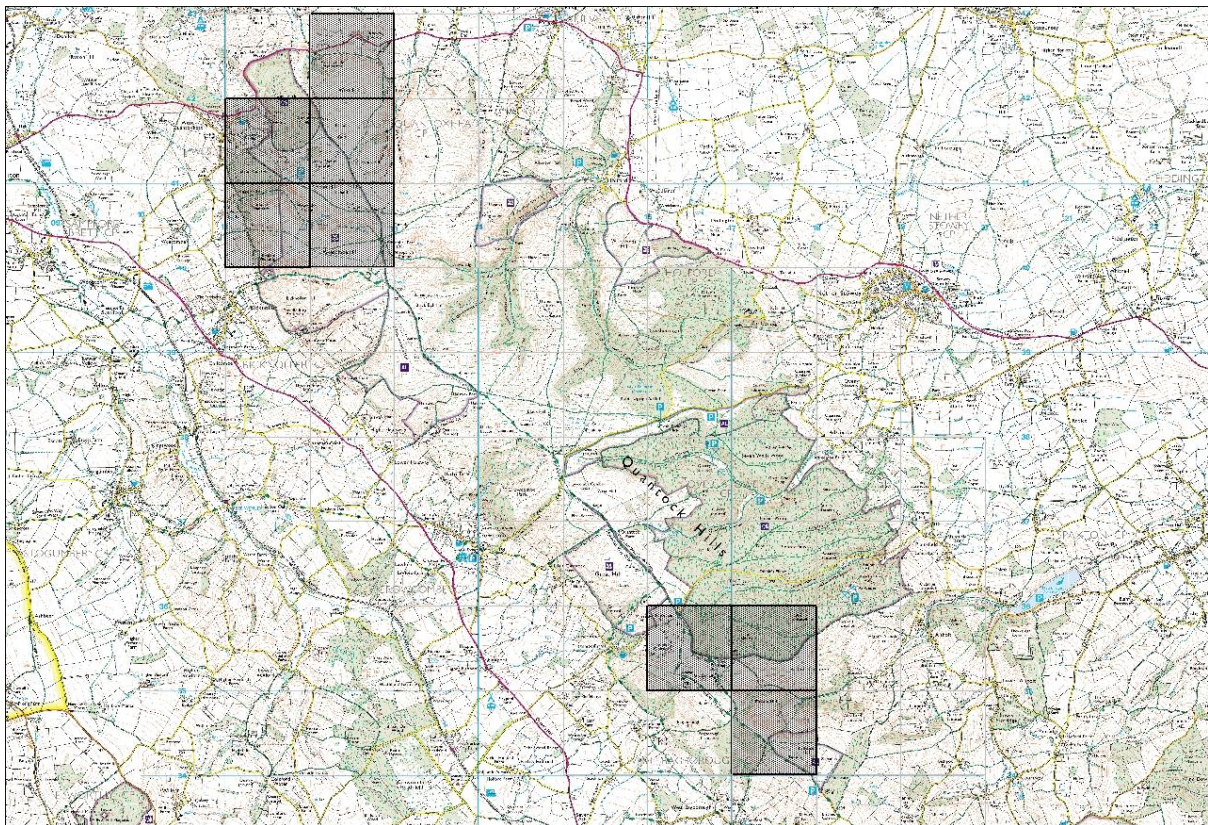


Figure 1: Map showing 1Km squares surveyed during 2012.

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Results

A total of 20 adders were sighted, of which five have been eliminated from the survey results due to ambiguity, making 15 new records for adders.

Three of the grid squares allocated to surveyors yielded sightings, while five did not. Grid squares 1635 and 1734 were the most productive, yielding eight and six sightings respectively, while square 1240 produced a single sighting.

Date	Group No	Grid Ref ST	Location	Life stage	Sex
1.4.12	1	1760234312	Lydeard Hill	Adult	Male
1.4.12	1	1760234312	Lydeard Hill	Adult	Female
1.4.12	1	1761134304	Lydeard Hill	Adult	Male
6.4.12	4	1600935869	Triscombe Stone	Adult	Female
6.4.12	4	1629035911	Triscombe Stone	Adult	Male
6.4.12	4	1629835904	Triscombe Stone	Adult	Male
6.4.12	4	1625635896	Triscombe Stone	Adult	Male
6.4.12	1	1759334320	Lydeard Hill	Adult	Male
6.4.12	1	1760134312	Lydeard Hill	Adult	Female
8.4.12	4	1625635896	Triscombe Stone	Adult	Female
8.4.12	4	1629035911	Triscombe Stone	Adult	Male
22.4.12	4	1617535240	W. of Wills neck	Adult	Male
12.5.12	4	1648635164	Wills Neck	Adult	Male
12.5.12	2	1289340051	S. of Bicknoller Post	Adult	Male
19.5.12	1	1768334284	Lydeard Hill	Adult	Female

TABLE 2: Location, life-stage and sex of adders recorded during surveying, 2012.

The location of each of these sightings was plotted on a map of the Quantock hills (Figure 2).

The resulting map clearly shows an assemblage of adders on Lydeard Hill at the south of the AONB and another around Triscombe Quarry a little to the northwest, while the northern area of the AONB yielded only a single sighting.



Figure 2: Plots showing locations of adders recorded during surveying in 2012.

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In order to give a comprehensive view of the distribution of adder assemblages on the Quantock range as currently understood, the results of the 2012 survey have also been plotted alongside all previous records collected since 2005, both by Palmer and by the previous RAGS survey. (Figure 3).



Figure 3: Locations of adders recorded since 2005. Data from 2012 survey in blue, all previous data since 2005 in black.

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A calculation was made of the number of hours spent searching each square, per sighting. Only three squares produced sightings, however nil sightings is a valid result therefore the process is relevant to all squares. As can be seen from Table 3, in square 1635 it was only necessary to search for 3.6 hours in order to gain a sighting of an adder, while in square 1734 this rises to 4.6 hours. In square 1240, 20.75 hours of searching was necessary to locate one adder. As can also be seen from the table, a considerable number of hours resulted in no sightings at all in some of the squares surveyed.

Grid Square	Man Hours	Sightings	Hours per sighting
1140	9	0	N/A
1141	4	0	N/A
1240	20.75	1	20.75
1241	19.5	0	N/A
1242	0	0	N/A
1635	29	8	3.6
1734	28	6	4.6
1735	11.75	0	N/A

TABLE 3: Hours spent surveying per sighting.

Discussion

Weather patterns during the spring of 2012 were unusual; persistent rain and low temperatures during the survey period prevented many surveyors from spending as much time in the field as they might have liked. However, despite this, two further spring assemblages of adders have been recorded; one on Lydeard Hill and the other around Triscombe quarry, suggesting that both of these areas are being used as hibernacula.

While 15 adder sightings have been plotted onto the map in Figure 2, they are not all easy to resolve as several of the records are very close to one another and some are from the same position. If greater resolution is required for any of the figures within this report, larger scale maps are available from the Quantock Hills AONB service.

Of those records from the same positions; on the 1st of April 2012 a male and a female were found coiled together on Lydford Hill, consequently they are plotted as a single point. Similarly an adult male was found basking in the same spot on two occasions, the first on the 6th of April 2012 then again on the 8th of April 2012 near Triscombe stone, resulting in a single point. It is likely that this was the same individual on both occasions.

However, also close to Triscombe stone, two different adders were recorded using the same basking site at different times. The first, a male, was sighted on the 6th of April 2012, and the second, a female, on the 8th of April 2012. Once again, this has resulted in a single point on the map.

Whilst this survey has created 15 new records, there were in fact a total of 20 sightings during the course of the survey. There were five records for which no GPS data were collected, and therefore the records could not be plotted. Of these, two were sightings of male adders on Lydeard Hill within square 1734, both on the 1st April 2012, bringing the total for that square to eight. Three further sightings were made in square 1635 near Triscombe stone; two males on the 8th of April and one male on the 22nd of April, giving a total of 11 sightings for this area. Such large numbers of sightings suggest that these are two important areas for adders on the Quantock range and they should be managed with the species in mind.

When the sightings made during both the 2011 and the 2012 RAGS surveys are amalgamated with previous data collected by Palmer, a pattern emerges of spring assemblages along much of the length of the south westerly facing escarpment of the Quantocks (see figure 3). Spring assemblages and consequently probable hibernation sites have now been identified on Lydeard Hill In the south, the area to the east of Triscombe Quarry, Great Hill, Wilmot's Pool, Black Hill, Halsway Hill and Thornecombe Hill in the north. Further north from this area the numbers of sightings reduce, becoming sightings of individuals as opposed to assemblages.

The 1Km squares that were selected for survey during 2012 deliberately focused on the northern and the southern reaches of the AONB where little data has previously been collected. While the southern squares have been shown to contain assemblages of adders the northern squares have not. However, Table 2 shows that there was considerable additional effort allocated to the southern squares than to those in the north of the range. In the north, only squares 1240 and 1241 were allocated very much effort and in fact one of the squares was not visited at all. Therefore, it would probably be premature to suggest that there are no assemblages in the northern part of the range and further survey work will need to be done in this area. Interestingly, the surveyors report that within square 1240 there is extensive suitable adder habitat.

Based on surveyors' reports, both squares 1141 and 1241 currently contain only limited suitable habitat, largely due to rhododendron invasion and subsequent eradication operations. In their current condition, these areas are unlikely to be important for adders, although if heathland regenerates following the removal of rhododendrons the potential for this area may increase. No reports on habitat conditions were received from the remaining squares surveyed in the north of the range.

It is very difficult to prove that a species is absent from a site, so the process of calculating the number of hours spent surveying a square per sighting was introduced in an attempt to find a point at which a square could confidently be abandoned and considered not to contain adders at the present time.

This technique is entirely experimental and it would be premature to draw any definitive conclusions as to its merit. Square 1240 yielded a sighting of a single adder after 20.75 hours of searching, despite reports of extensive suitable habitat within the square; therefore, it would clearly be an error to abandon a square before this amount of effort has been invested as a minimum. By contrast, square 1635 yielded a sighting of an adder for every 3.6 hours spent searching. This suggests that the exercise may not be helpful as a method of determining absolute absence of adders. However, it may perhaps have some use as a rough measure of the density of adders within a square.

There are, of course, many potential sources of error with the technique. The experience and expertise of surveyors is variable. This may result in some surveys being conducted during inappropriate weather conditions, or may lead to anomalies regarding the identification of suitable habitat patches within the site. In addition, experience and skill in spotting snakes may vary. As a technique to attempt to measure density, it is likely that in a survey that does not seek to identify individuals, the same individual may be encountered on more than one occasion and be assumed by the surveyor to be a different animal. In this survey, a number of sightings have been in very close proximity to one another, lending weight to this possibility. Consequently, the relevant data collected so far can show the relative importance of individual squares to the adders, but nothing further. However, this is

the first year that this data has been collected, and if the technique is retained for future surveys, it may be that as further data accumulates, a more useful pattern will emerge.

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References

Dickson, J. (2011). RAGS report on a survey to map the distribution of the adder (*Vipera berus*) within the Quantock Hills AONB in Somerset. Spring 2011. Unpublished report for Quantock Hills AONB Service. Available at: www.somersetarg.org.uk

Palmer, K. (2009). A report on the distribution of the European adder (*Vipera berus*) in data deficient areas of the Quantock Hills AONB: A need for conservation management. Unpublished report for Quantock Hills AONB Service.

Palmer, K. (2011). Vegetation structure at basking sites of the adder *Vipera berus*: Implications for site management. *Herpetological Bulletin*. **117**. 25-27.

APPENDIX 1

Survey recording form

QUANTOCK ADDER SURVEY RECORDING FORM

Please complete a form for each visit and for each sighting.

Part One – Surveyors Details	
Date of visit:	Group Number:
Surveyors Present:	Time of survey: From: To:
Part Two – Site Details	
Grid square surveyed: ST	Weather conditions:
General habitat structure in square surveyed: (Please tick as appropriate) Heath: <input type="checkbox"/> Grassland: <input type="checkbox"/> Scrub: <input type="checkbox"/> Woodland: <input type="checkbox"/>	Other habitat structure: (Please specify)
Part Three – Adder Sighting	
Number of Adders seen: (Please include nil)	If you have answered nil the form is complete. Please do not continue further.
Adder Information	
Grid Ref from GPS: ST	Sex: (Please tick as appropriate) Male <input type="checkbox"/> Female <input type="checkbox"/> Adult sex unknown <input type="checkbox"/> Juvenile sex unknown <input type="checkbox"/>
Distinguishing features of individual: (i.e. colour, length, markings.)	

Please indicate best description of habitat in which animal was found: (Please tick as appropriate)

Homogenous, mature thick stand of heath:

Homogenous, immature open stand of heath:

Matrix with diverse range of heathland structure:

Woodland:

Other: (Please specify)

Please indicate which of the following botanical species are present within approximately 5m of the sighting: (Please tick as appropriate)

Heather:

Gorse:

Bracken:

Bilberry:

Acidic grasses:

Birch Tree(s):

Other: (Please specify)

Please estimate approximate distance (cm) of the adder to the nearest edge/vegetation boundary:

Please insert any further useful information here:

Please record other reptiles observed and Grid references:

Once completed please return form to:

RAGS

Binswood House

Bleadney

Wells BA5 1PF