

RING OUZEL REPORT 2010



FINDINGS OF A STUDY OF RING OUZEL *Turdus torquatus* TERRITORIES IN ROSEDALE AND OTHER AREAS OF THE NORTH YORK MOORS

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January 2011

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Front cover photograph: Male ring ouzel on passage amongst razor-wire at RAF Fylingdales May 2010.

1. HIGHLIGHTS OF 2010 RING OUZEL STUDY

- First arrival in Rosedale seen on 24th March - the earliest recorded.
- 12 territories recorded in the Rosedale Area - 3 more than 2009.
- Territories recorded in 2010 back to the 2004-2008 average.
- First year that breeding density has been as high as 3 per sq./km.
- First time nest recorded in old quarry at Dalehead east, Rosedale.
- Dialect of male nesting in Dalehead quarry not Rosedale type.
- 2 broods fledged at Hob Crag quarry - past attempts all predated.
- Same nest at Hob Crag used for both broods - first time recorded.
- A total of 30 young fledged from 13 nests - the most nests recorded.
- 5 nests had second clutches - the best recorded.

2. INTRODUCTION

The 2010 survey was the 11th year in which a detailed study had been made of the ring ouzel *Turdus torquatus torquatus* (RZ) population in the North York Moors National Park. Only the foot & mouth outbreak in 2001 and the subsequent closure of the moors during that year prevented what otherwise would have been a continuous period of recording. The findings of these studies were submitted to various bodies including the North York Moors National Park Authority, the RSPB Ring Ouzel Study Group, Natural England (York office) and the land owner and head keeper of Spaunton Estate.

As in previous years the 2010 survey concentrated on the Rosedale area of the North York Moors; an area of around 25 sq/km. As for the last few years, a visit was made during late summer to the main areas of rowan trees at the north-end of the dale to locate ring ouzels prior to migration.

Graphs of temperature and rainfall for the main breeding months of April through to July have again been included at **Annex 7 & 8**. Temperature data was obtained from the Scaling Dam sailing club weather station which lies some 15 kilometres northeast of Rosedale at an altitude of 190 metres. Rainfall data for 2010 was obtained from a weather station at Rudland which lies some 8 kilometres west of Rosedale at an altitude of 210 metres.

The continuing support of a Rosedale resident provided invaluable help in monitoring the east side of the dale and gave considerable support to both Vic Fairbrother, covering the top-end of the dale north of Blakey Crossing, and Ken Hutchinson covering the central and southern part on the west side of the dale. Some 93 visits were made between March and September amounting to over 500 hours of field work.

Finally, an extensive survey was carried out between April and June across the North York Moors by Chris Tyas. His findings are tabled at **Annex 3**. The authors are indebted to Chris for the considerable effort he put in visiting past breeding sites as well as finding several sites where breeding had not been recorded before.

3. METHODOLOGY

The criteria used to assess the breeding status and thus the existence of a territory is shown in the table below.

BREEDING STATUS	CRITERIA
Probable	<ul style="list-style-type: none">• Male observed singing on two different days in a week or more at the same place.• Territorial behaviour observed on two or more days.• Pair observed in suitable nesting habitat• Nest-building activity.
Confirmed	<ul style="list-style-type: none">• Nest found with eggs or chicks.• Recently fledged young seen.• Adult seen carrying food.

References in this report to **Rosedale area** include the main dale (valley) of Rosedale and adjoining Spaunton Moor (Spindle Thorn, Loskey Ridge etc.). References to **Rosedale** refer only to the main dale of Rosedale.

4. RESULTS

Territories

Rosedale Area

Table 1: Breeding ring ouzel territories occupied in the Rosedale area between 1999 and 2010.

No.	Location (all territories recorded to date)	Grid Ref.	Year										
			99	00	02	03	04	05	06	07	08	09	10
1.	Spaunton Moor - Spindle Thorn	SE 716 930	?	x	✓	x	x	x	x	x	✓	x	x
2.	Spaunton Moor - Loskey Ridge 1	SE 715 934	?	✓	✓	✓	x	x	✓	x	x	x	x
3.	Spaunton Moor - Loskey Ridge 2	SE 713 931	?	x	x	✓	✓	✓	x	x	x	x	x
4.	Rosedale west - Bank Top	SE 720 951	✓	✓	✓	✓	x	x	✓	x	x	x	x
5.	Rosedale west - Bank Top (east)	SE 725 945	?	x	x	✓	x	✓	x	x	x	x	x
6.	Rosedale west - Hob Crag	SE 714 954	?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
7.	Rosedale west - Thorgill Bank	SE 707 958	?	x	x	✓	x	x	✓	x	x	x	x
8.	Rosedale west - Thorgill Head	SE 670 956	?	x	✓	✓	✓	✓	x	x	x	x	x
9.	Rosedale west - Sheriff's Pit	SE 697 963	✓	✓	✓	x	✓	✓	✓	x	✓	✓	✓
10.	Rosedale west - Sheriff's Pit (south)	SE 698 961	x	x	x	x	x	x	✓	x	x	x	x
11.	Rosedale west - Round Hill (south)	SE 694 968	?	x	✓	✓	✓	✓	✓	✓	✓	✓	x
12.	Rosedale west - Round Hill (central)	SE 694 970	?	x	✓	✓	✓	x	x	✓	✓	✓	✓
13.	Rosedale west - Round Hill (north)	SE 693 974	?	x	✓	x	x	x	x	✓	x	x	x
14.	Rosedale west - Sledge Shoe Bents	SE 691 978	?	✓	✓	✓	✓	✓	✓	x	x	✓	x
15.	Rosedale west - Matty Carr Hill	SE 688 983	?	x	x	✓	✓	✓	✓	✓	✓	x	✓
16.	Rosedale west - Matty Carr Hill (south)	SE 690 980	?	x	x	x	x	✓	x	✓	x	x	x
17.	Rosedale west - Lion Inn	SE 681 999	x	✓	✓	✓	x	✓	x	✓	x	x	x
18.	Rosedale west - Blakey Swang	SE 685 998	?	?	?	?	?	?	?	?	✓	x	x
19.	Rosedale west - Dalehead (north)	NZ 680 010	✓	x	✓	x	✓	x	x	x	✓	x	✓
20.	Rosedale west - Dalehead (west)	NZ 680 008	x	x	✓	✓	✓	✓	✓	✓	x	✓	x
21.	Rosedale east - Dalehead (east)	NZ 686 009	x	x	x	✓	✓	x	x	x	x	x	x
22.	Rosedale west - Dalehead (south)	NZ 682 005	x	x	✓	x	x	x	x	x	x	x	x
23.	Rosedale east - Dalehead (quarry east)	NZ 685 006	x	x	x	x	x	x	x	x	x	x	✓
24.	Rosedale east - Dalehead (quarry west)	NZ 683 008	x	x	x	x	x	x	x	x	x	x	✓
25.	Rosedale east - Reeking Gill	NZ 691 007	✓	✓	✓	x	x	✓	✓	✓	✓	✓	✓
26.	Rosedale east - Reeking Gill (cutting)	NZ 688 007	x	x	x	x	x	x	x	✓	✓	x	✓
27.	Rosedale east - Nab Scar (north)	NZ 692 002	x	✓	x	✓	✓	✓	✓	✓	x	✓	✓
28.	Rosedale east - Nab Scar (south)	SE 695 999	x	x	x	x	x	x	x	x	x	x	✓
29.	Rosedale east - Sturdy Bank	NZ 699 000	✓	✓	✓	✓	x	x	x	x	✓	✓	✓
30.	Rosedale east - East Mine	SE 705 989	?	?	?	?	?	?	?	?	✓	x	x
TOTAL			5	9	16	16	12	13	12	11	12	9	12

Note:

1. Only a partial survey was carried out in 1999.
2. Foot & mouth prevented field work in 2001.

✓ = occupied by pair x = not occupied ? = not checked

See **Annex 1** for location of 2010 territories & nests.

Other Areas of the North York Moors

An extensive and detailed survey was carried out in 2010 across the North York Moors by Chris Tyas. His findings are shown at **Annex 3**.

Nest Sites

Table 2: Ring ouzel nest sites located in Rosedale and other areas of the North York Moors in 2010.

No.	Location	Grid Ref.	Comment
1.	Rosedale west - Sheriff's Pit	SE 6973 9627	Located 20/05; 3 pulli; all fledged.
2.	Rosedale west - Hob Crag 1 st	SE 7138 9544	Located 17/05; 4 pulli; all fledged.
3.	Rosedale west - Hob Crag 2 nd	SE 7138 9544	Located 17/06; 4 pulli; 2 fledged.
4.	Rosedale west - Round Hill (central)	SE 6943 9690	Located 24/05; 4 pulli; all fledged.
5.	Rosedale east - Reeking Gill	NZ 6908 0068	Located 08/05; 4 pulli; all fledged.
6.	Rosedale east - Sturdy Bank 1	NZ 6989 0000	Located 27/04; 3 eggs; 3 pulli; all fledged.
7.	Rosedale east - Sturdy Bank 2	NZ 6987 0005	Located 16/06; Assumed predated at egg stage.
8.	Rosedale east - Reeking Gill cutting 1	NZ 6879 0066	Located 11/05; 4 eggs; 4 pulli; all fledged.
9.	Rosedale east - Reeking Gill cutting 2	NZ 6886 0068	Located 03/07; 3 pulli; all fledged.
10.	Rosedale east - Dalehead (quarry west)	NZ 6828 0082	Located 14/06; At least 1 pulli; 1 fledgling seen.
11.	Bransdale east - Ousegill Bridge	SE 6392 9444	Located 12/06; 5 eggs; predated at egg stage.
12.	Bransdale east - Ousegill 1	SE 6400 9511	Located 03/05; 4 pulli; 3 fledged; 1 dead below nest.
13.	Bransdale east - Ousegill 2	SE 6398 9497	Located 12/06; 5 eggs, 3 hatched; 3 pulli; predated.

Annual Breeding Results

Table 3: Summary of annual breeding results at ring ouzel nest sites in Rosedale & other areas of the North York Moors. Data from 2000 to 2010.

Year	Nests	Laying pairs (2 nd clutch)	Pairs that hatched young (2 nd attempt) [2 nd brood]	Pairs that fledged young (2 nd attempt/ brood)	Pairs that failed completely	Total Young fledged	Mean fledged young per successful nests	Mean fledged young per laying pairs
00	1	1	1	1	0	4	4.00	4.00
02	2	1 (1)	1 (1)	1 (1)	0	4	4.00	4.00
03	7	6 (1)	5 [1]	3	3	11	3.66	1.83
04	5	4 (1)	4 (1)	2 (1)	2	8	4.00	2.00
05	7	4 (2)	4 (1)[1]	4 (2) ^a	0	13	3.25	3.25
06	4	2	1 (1)	1(1) ^b	Possibly 1	5	5.00	2.50
07	4	4	3	3	1	12	4.00	3.00
08	10	7(1)	6 ^c (1) [1]	5(1)	2	23	4.60	3.29
09	5	4(1)	4[1]	4(1)	0	19	4.75	4.75
10	13	8 (5)	7 [2]	7(2)	1	30	4.28	3.75
Overall Mean							4.15^d	3.24
<p>Note</p> <p>^a. One pair had two unsuccessful attempts before being successful at third attempt.</p> <p>^b. One pair had one unsuccessful attempt before being successful at second attempt.</p> <p>^c. One pair had two unsuccessful attempts; the 1st predated at the chick stage, the 2nd at the egg stage.</p> <p>^d. Average brood size for: Glen Esk (Burfield) 3.48; Moorfoots (Burfield) 3.50; Yorkshire Dales (Appleyard) 3.60; BTO Nest Records (Flegg & Glue) 3.60.</p>								

A detailed break down of annual breeding results at ring ouzel nest sites in the Rosedale and other areas of the North York Moors between 2000 and 2010 are presented in **Annex 4**.

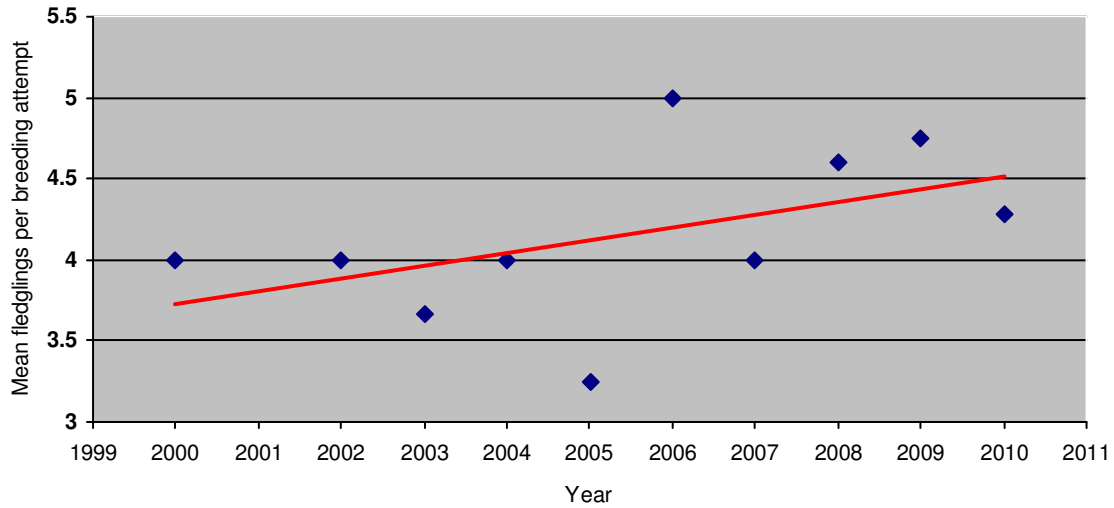


Figure 1. Annual mean number of fledglings per breeding attempt for Rosedale and other areas of the North York Moors between 2000-2010.

First-egg Laying Dates

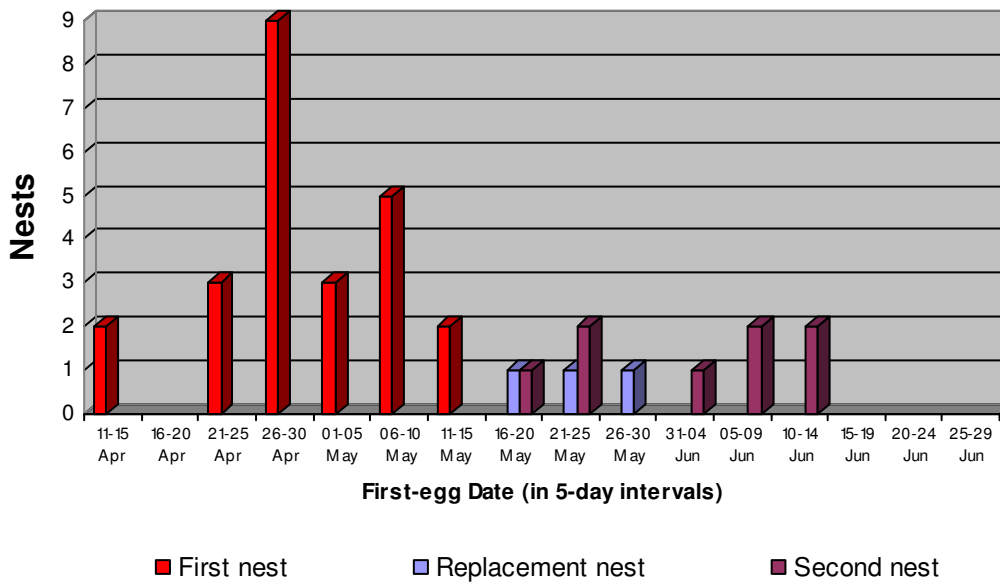


Figure 2. First-egg laying dates for Rosedale and other areas of the North York Moors between 2000-2010. Data points in 5-day intervals for the months of April, May & June. (n=35)

First-egg, Hatching & Fledging Dates

Table 4. First-egg, hatching & fledging dates for Rosedale and other areas of the North York Moors.

Year	Nest location	1 st Egg	Hatching	Fledging	Comments
2000	Spaunton Moor	6 May (a)	21 May (a)	3 June	
2002	Bank Top	17 May	1 June	15 June	Replacement nest/eggs.
2004	Matty Carr Hill	26 April	11 May	25 May	
	Hob Crag	10 June (a)	26 June (p)	-	2 nd nest.
2006	Ousegill Bridge	9 May	25 May	7 June	
	Sheriff's Pit south	20 May	5 June	18 June	Replacement nest/eggs.
2007	Round Hill south	5 May (a)	20 May (a)	2 June (a)	
	Hob Crag	5 May (p)	-	-	
	Reeking Gill west	25 April	11 May	24 May	
	Dalehead west	28 April	14 May	27 May	
2008	Sturdy Bank 1 st	28 April	14 May (a)	27 May (a)	
	Sturdy Bank 2 nd	9 June	25 June (a)	9 July (a)	1 st egg 13 days after 1 st nest fledged.
	Round Hill south	30 April	16 May (a)	29 May	
	Reeking Gill	4 May	20 May (a)	2 June	
	West Gill	24 April	10 May	23 May	Seen copulating on 22 April.
	Hob Crag 1 st	27 April	13 May (p)	-	
	Hob Crag 2 nd	27 May (p)	-	-	Replacement nest/eggs.
	Sheriff's Pit	6 May	22 May	4 June	
Dalehead north	24 May	9 June (a) (p)	-	Likely replacement nest/eggs.	
2009	Reeking Gill	15 April	1 May	14 May	Pair arrived in gill on 25 March.
	Sturdy Bank	13 May (a)	29 May (a)	11 June (a)	Pair arrived in gill on 26 March.
	Round Hill south	25 April	11 May	24 May	1 st nest. 2 nd nest at Sheriff's Pit.
	Dalehead west	9 May	25 May	8 June	
	Sheriff's Pit	25 May	10 June	23 June (a)	2 nd nest. 1 st nest at Round Hill south.
2010	Sturdy Bank 1	30 April (a)	16 May (a)	29 May (a)	1 st nest.
	Reeking Gill	15 April	1 May	14 May (a)	1 st nest.
	Reeking Gill cut. 1	8 May	24 May (a)	6 June	1 st nest.
	Reeking Gill cut. 2	10 June	26 June	7 July	2 nd nest. Likely fledged at 11 days.
	Ousegill 1	27 April	13 May (a)	26 May	1 st nest.
	Ousegill 2	1 June	17 June (a)	-	2 nd nest. Failed at chick stage.
	Hob Crag 1	28 April	14 May	28 May (a)	1 st nest. Fledged at 14 days.
	Hob Crag 2	8 June	24 June	7 July	2 nd nest
	Sheriff's Pit	12 May	28 May	10 June	Likely to be 1 st nest.
	Round Hill central	26 April	12 May	25 May	1 st nest.
Dalehead quarry west	21 May	6 June	19 June	Likely to be 2 nd nest.	
(a) = actual (p) = predated					
Dates other than actual are based on a 29 day breeding cycle assuming female commences sitting on 3 rd egg and both incubation and chick stage take 13 days.					

Distance between First & Second Nests

The distance between first and second nests is shown below in Table 5. Most built their second nest close to the first. The exception to this was the 2009 pair that moved more than half a kilometre to build their second nest - the pair were easily identified by the female's distinct white head marking. Studies by Appleyard in the Yorkshire Dales record a mean distance between first, second and third brood nests (n=26) of 64 metres with a median of 55 metres. For the North York Moors (n=10) the mean and median values are 108 metres and 61 metres respectively.

Table 5. Distance between 1st & 2nd nests located in Rosedale and other areas of the North York Moors.

Year	Location	National Grid Reference		Distance (metres)	Comment
		First nest	Second nest		
2003	Thorgill Bank	SE7072195811	SE7073895808	17	
2005	Sheriff's Pit	SE6972196263	SE6972296271	8	
2006	Sheriffs Pit/Sheriff's Pit south	SE6972296268	SE6978496106	173	1 st - Sheriff's Pit 2 nd - Sheriff's Pit south
2008	Hob Crag	SE7144295395	SE7138795446	75	2 nd is replacement nest
2008	Sturdy Bank	SE6989499907	SE6986599899	30	
2009	Round Hill south/Sheriff's Pit	SE6953396742	SE6972596266	513	1 st - Round Hill south 2 nd - Sheriff's Pit
2010	Bransdale, Ousegill	SE6399795110	SE6397994971	140	
2010	Hob Crag	SE7138195441	SE7131895441	0	First nest was reused.
2010	Sturdy Bank	NZ6988800004	NZ6987000054	53	
2010	Reeking Gill cutting	NZ6879000661	NZ6885600683	69	

Nest Aspect & Elevation

The aspect and elevation of 51 nests mainly in the Rosedale area of the North York Moors are tabled at **Annex 5**. Diagrams showing the aspect of 48 nests in the Rosedale area and the elevation profile of 44 nests in Rosedale are shown at **Annex 6**, Fig.1 & 2 respectively.

5. DISCUSSION

Weather Conditions

March: A cold start to the month gave way to milder conditions in the second half with mid-day temperatures reaching 10°C on the 24th. Wind direction favoured those birds migrating from the south with a predominant south-westerly air flow setting in during the final week of the month; the first arrival on the Moors was seen on the 24th - a day earlier than 2009 and the earliest recorded.

April: The first week of the month saw unsettled conditions with strong westerly winds. Thereafter anti-cyclonic conditions became established with lighter mainly westerly winds and daytime temperatures above the seasonal norm with afternoon temperatures higher than 15°C between the 22nd and 30th; rising to a high of 21°C on the 28th. Rainfall remained low for most of the month with a long dry period between the 9th and 25th.

May: The first half of the month saw unsettled conditions with strong north-easterly winds and frequent showers for the first week. Thereafter temperatures rose during the second half of the month with daytime readings above 15°C for most days between the 13th and 31st. A high of 27°C occurred on the 22nd and 23rd; setting a likely high for the month. Rainfall generally was below average with 20 days showing no significant precipitation. The long dry spell in the second half resulted in the Fire Warning signs being put up across the National Park.

June: Anti-cyclonic conditions dominated much of the month with significant rainfall occurring between the 7th and 10th; when over 30mm fell. For much of the time daytime temperatures stayed above 20°C with mainly dry conditions occurring between the 11th and 30th. Winds in the second half were light and from the west.

July: Generally the month was settled with afternoon temperatures staying above 20°C for the most. Significant rainfall occurred during the period 13th to the 22nd when over 38mm fell.

Overall the weather conditions over the breeding period were favourable with the main nesting months of mid April through to early July being relatively settled with no weather extremes occurring to cause concern during the nesting period. However, the significant rainfall that fell during the second half of July may have affected the survival of the second brood fledglings.

Graphs of temperature and rainfall between April & July are shown at **Annex 7 & 8** respectively.

First Arrivals

The first ring ouzels to be recorded in Rosedale in 2010 were seen on 24th March; the earliest recorded and a day earlier than in 2009. A single male was seen feeding alongside the railway track at the north end of the dale on the west side close to the brick ruin and three males were seen on the east side of the dale; two at Reeking Gill and one at East Mines.

A day later on the 25th a male was heard/seen singing on the east side of the dale north-west of Reeking Gill and later that day a male was observed flying into the railway cutting west of Reeking Gill. On the 26th a male was seen at Sturdy Bank in the grassy area towards the top of the gill on the west side.

On the 28th March a pair were seen feeding in the meadow below the crag at Round Hill south. By the first week in April males and females had been seen in several locations in Rosedale and by the 15th males were singing throughout the dale.

The first arrival noted in Bransdale was a singing male on the 29th March at Ousegill Bridge.

Rosedale Territories

Twelve ring ouzel territories were recorded in 2010 in the Rosedale area of the North York Moors. An increase of three on the 2009 count (Figure 3).

Ten of the 12 territories had been occupied before; some 7 or more times in the last 10 years. Two, Nab Scar south and Dalehead quarry, were recorded for the first time in 2010. See **Annex 1** for location of 2010 territories.

The breeding density was also higher in 2010 and the highest recorded to date. On the east side of the dale at Dalehead the density per sq. km. was 3 and between Reeking Gill and Sturdy Bank was 2.5 per sq. km. In previous years a density of 2 was the maximum likely to be found in Rosedale; such as on the west side of the dale at Sheriff's Pit and Round Hill. More often, though, a maximum breeding density of ≤ 1 per sq. km was found to be typical for the Rosedale area.

A total of 29 territories have been recorded in the Rosedale area between 1999-2010 (Table 1).

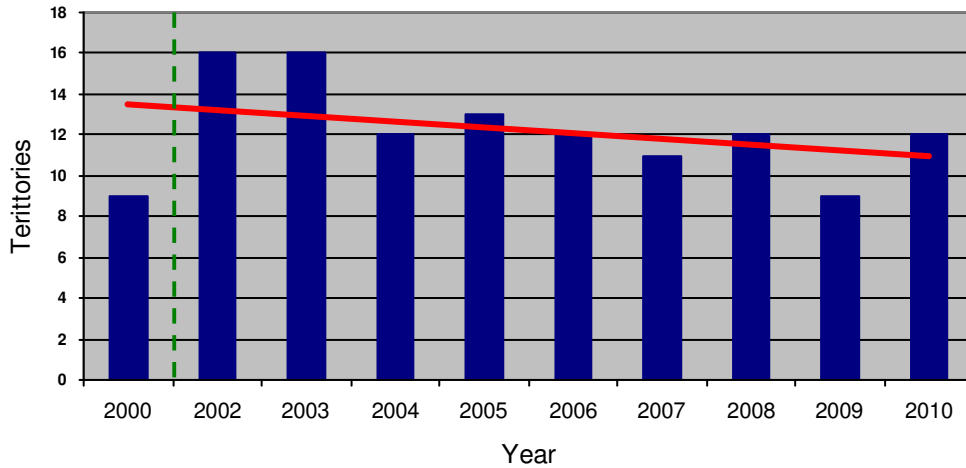


Figure 3: Confirmed & Probable territories in the Rosedale area of the North York Moors for the period 2000-2010. (foot & mouth prevented field work in 2001)

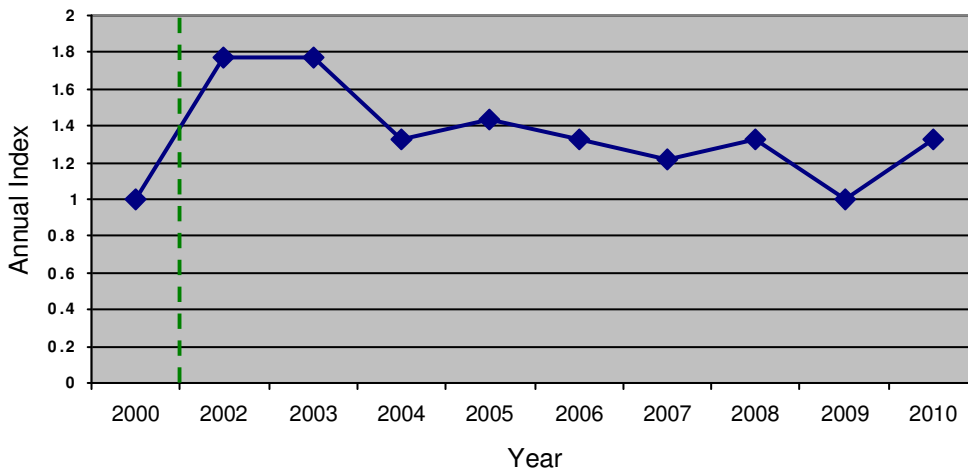


Figure 4: Annual indices of Confirmed & Probable territories in the Rosedale area for the period 2000-2010, referenced to 2000. (foot & mouth prevented field work in 2001)

From a peak of 16 territories in 2002 and 2003, the years 2004-8 recorded 12, 13, 12, 11 & 12 territories respectively; an average of 12 territories per year and a seemingly stable situation. The drop to 9 territories in 2009 was cause for concern and prompted an anxious wait for the 2010 outcome to see if this signalled the start of a decline. Happily the 12 territories recorded in 2010 showed the 2009 result to be a blip and that this season's findings were back to the average for the 2004-8 period. Relief all round and the hope that the 2009 result was a one-off.

Dalehead quarry east & west

The large quarry on the east side at the north end of the dale has attracted ring ouzels over the years but without any evidence of breeding having taken place. So it was a great surprise when a pair were found to be nesting at the west end of the quarry in 2010. Activity was observed at the east end of the quarry throughout May and June with two males recorded counter singing on 3rd June - one at the west end and the other in the middle part of the quarry. On 14th June two males were seen/heard singing, one close to the nest at the west end of the quarry and the other from a group of trees at the east end close to the beck. Again on the 21st June a male was singing from a tree close to the beck at the east end of the quarry while at the same time a male (from the west end territory) was singing from a tree in the central part of the quarry. No nest was discovered at the east end of the quarry but the behaviour of the male pointed to a territory being held.

Dalehead north

The exact site of the territory was impossible to determine at this location as no nest was found. However, on the 17th May a pair were seen feeding young on the northern curve of the track and sightings of both a male and female had been noted in the same locality on the 9th and 11th May. This territory would seem to have been taken-up in early April making this one of the earliest territories in 2010.

Hob Crag

Has been a favourite site over the years but has suffered from heavy predation when birds have attempted to nest in the quarry. It was therefore pleasing to be able to observe two successful nests in 2010 when a 'canny' bird chose a location high on the quarry face (see Nest Report below).

Matty Carr Hill

Like the Dalehead north territory the exact site of this territory was impossible to determine. A male was seen in the quarry area on 6th and 8th April and a pair on the 12th just below the quarry. On the 19th April a pair were seen foraging some 300 metres north of the quarry but nothing further until the 24th June when a pair with three juveniles were seen at the south end of the quarry. The party later flew across to the east side of Matty Carr bottom and continued to forage as a family group. A juvenile was also heard calling around the same time from the heather below the quarry. This territory has been used on seven occasions within the last eight years.

Nab Scar north

Was used again in 2010, the eighth time in 10 years. The pair as in previous years were elusive giving no hint as to the location of their nest. As mentioned in previous reports it is a difficult site to observe and finding a concealed location with good views of the surrounding area has to date proved impossible.

Nab Scar south

Is a new territory and 2010 was the first time the area at the south end of the scar had been used. As for the adjoining territory of Nab Scar north, a nest was not located as finding a concealed location to observe the territory was not possible.

Reeking Gill

Has been used most years since 1999. This year was no exception and a pair were first seen in the gill on 8 April, the female being highly conspicuous in having a distinct white head. With such an obvious female it was hoped to be able to track her movements throughout the season. However, after the first brood fledged there were no further sightings of this unusually marked female.

Reeking Gill cutting

Has been used for three of the last four years. The steep heather-clad sides of the disused railway cutting provides an ideal site. The 2010, both 1st and 2nd nests, could easily be observed from the footpath that ran along the top of the cutting on the opposite side.

Round Hill central

Has been a territory used on and off over the last 11 years. This territory adjoins Round Hill south and both sites appear to have a common feeding area with pairs from both territories seen feeding together on several occasions in the adjoining meadow. N.B. the Round Hill south territory could not be confirmed in 2010 and so is not included in the results.

Sheriff's Pit

Was used again in 2010 with a pair building a nest in the disused mine shaft. Apart from 2003/7 this site has been used each year since the studies commenced in 1999. This is the only shaft in the Rosedale study area and its prominent location attracts sightseers. Despite this intrusion the ring ouzels nesting here appear tolerant to the extent that the female was observed on several occasions sitting tight on the nest watching the comings and goings without apparent concern.

Sturdy Bank

Again this frequently used site attracted a pair. A male was first seen on the 26th March towards the top of the gill with further sightings throughout the first part of April. The male was joined by a female on 11th April and the first-egg was laid on the 30th April.

North York Moors Territories

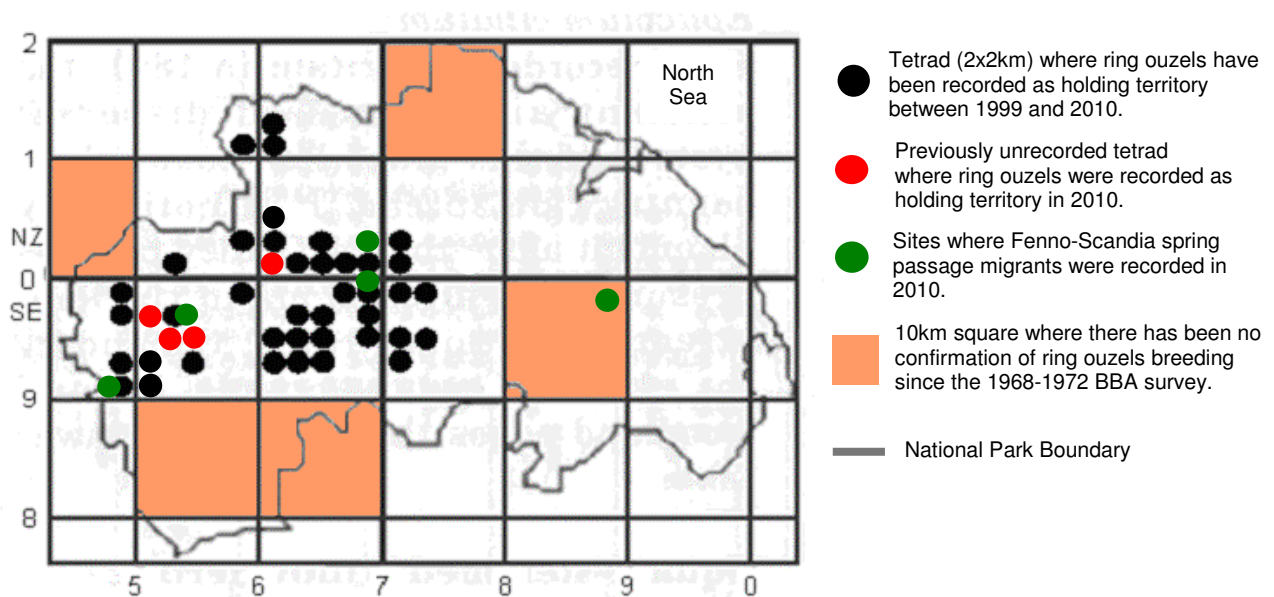


Figure 4: Tetrads holding a ring ouzel territory in the North York Moors between 1999-2010 and the tetrads where spring passage migrants were recorded in 2010.

Rosedale Nests

Dalehead quarry

For the first time a nest was located at the western end of this large quarry. Both male and female were observed entering a large patch of bilberry with food on 14th June. An inspection of the nest was attempted at that time but its location in deep bilberry high on a rock ledge proved inaccessible. A further attempt was made on the 18th June when the nest was eventually found some 30cm down inside a dense bilberry bush. From the limited view one nestling could be seen with its head above edge of nest and observed to be well feathered with obvious downy feathers visible. An audio recording made on the 14th showed the male had a non-Rosedale dialect and to have similar characteristics to a Farndale male recorded in that dale at Gill Wath in 2009 (Gill Wath is 2km west of Dalehead quarry). This was the first time a ring ouzel with a non Rosedale dialect was recorded nesting in Rosedale.

Hob Crag

The old quarry at Hob crag has seen several nesting attempts over the last 10 years and all to date have been predated at the egg or chick stage. Activity in the quarry area in 2010 occurred on 15th April when a pair were lured in the rocky area below the main quarry. On 3rd May a further visit was made and a female flushed from an area close to the 2009 nest site in the main quarry; though a close inspection of the immediate area found nothing. The quarry was again visited on the 10th May and the female seen below the main quarry but despite 5 hours of observation no clue as to the whereabouts of a nest was forthcoming. A lengthy session of observation on the 17th paid off when the nest was finally located on a ledge with a heather overhang some 4 metres above ground level on the quarry wall; about 3 metres down from the top. Good views into the nest were obtained from the top of the quarry looking down on the nest from about 5 metres. On the 17th the female was sitting tight on the nest and would not be moved, a further check on the 20th found 4 pulli estimated to be 6 days old. A visit on the 27th found 4 large young looking close to fledging with one stood on the rim of the nest wing-flapping. A second nest was located on 17th June using the same nest as the first; the first time this had been recorded. On 28th June 4 pulli were seen that were estimated to be 4 days old. Calculating the first-egg date of the second clutch suggested this was laid 10 days after the first brood fledged. By the 5th July only 2 well grown young could be seen and a visit on the 8th found the nest empty and the adults going into the heather with food about 60 metres from the nest site. A very successful outcome in this problem area and thanks to the local keeper who ensured the quarry area was well covered with predator traps during the breeding period.

Reeking Gill

The nest at Reeking Gill was located on 8th May and contained 4 pulli which were estimated to be about 8 days old. The nest was situated on a grass covered rock ledge just above head height. Both adults were seen on the 9th going to the nest with food. On the 11th the young were visible from a distance and seen flapping their wings when the adults approached with food. A visit on the 14th found the nest empty with the young having just fledged and some 10 to 30 metres from the nest site. On the 17th the male was seen carrying food to a fledgling which was later seen and photographed. The disappointment at this site was the lack of a second nest and that there were no further sightings of the white headed female after the first brood had fledged.

Reeking Gill cutting

The nest in the disused railway cutting was located on 12th May and had 4 eggs; the site having been used on two previous occasions - 2007/08. The nest was located on the north side of the cutting and was visible from the public footpath that passed along the top of the opposite bank. The female seemed nervous and was easily disturbed by passing walkers/cyclists suggesting that this may have been her first attempt. The site was visited every day to establish the first-egg date. On the 24th May the first chick hatched and on inspection the pulli was found to be still egg shaped with a second egg starting to crack that looked like hatching later that day. On 2nd June the adults were seen carrying food and later the same day the female was seen on the nest. On the 11th the female was flushed from the cutting and on inspection the nest was found to be

empty. A second nest with 3 pulli was located on the 3rd July just under 70 metres east of the first nest on the same side of the cutting situated on a rock shelf behind fern with overhanging heather - a visit the next day estimated the pulli to be 8 days old. The site was visited on the 7th July when the nest was found empty but the female was observed going into the heather close by sounding an alarm call. Calculating the first-egg date of the second clutch suggested this was laid just 4 days after the first brood fledged. The distance between the first and second nest was 69 metres.

Round Hill

After much time and effort had been spent over the previous week monitoring the general area, the nest was eventually found on 20th May towards the bottom of the dale. The nest in deep heather on a steep bank contained 4 pulli estimated to be 8 days old. A visit on the 24th found 4 very large young looking close to fledging. A check three days later on the 27th found the nest empty with no sign of the fledglings nearby or the adults with food. Later the same day a pair of ring ouzels were seen foraging some 400 metres from the nest site at a location where the adults had been seen on previous occasions collecting food. An interesting observation on the 20th May was the male singing from a tree about 500 metres from the nest while the female made several visits to the nest with food; the male generally seemed disinterested in feeding the young. On the 1st July two juveniles were seen just 58 metres from the nest site. One approached within just two metres looking inquisitively while sounding the alarm then after a minute or so started making a faint cheap that lasted 4 or so minutes before it flew off.

Sheriff's Pit

The nest was located on 20th May close to the 2009 nest on the sloping west side of the disused pit shaft. As in previous years, monitoring proved difficult as observations had to be made with a scope looking through the security fence from the opposite side of the shaft to the nest; a distance of around 6 metres. On the 24th it was just possible to see 2 eggs in the nest when the female left. Returning on the 27th the female was sitting tight as she was on the 31st. On 7th June 3 pulli could clearly be seen moving around and looked around 8 days old; both adults were feeding the young and the male was observed singing a short snatch of simple song from a nearby post before going to the nest with food. A visit on the 10th June in misty conditions found the nest looking empty and what sounded to be a juvenile cheeping from the heather - the poor visibility made it difficult to see more than 20m. On the 17th the female was seen carrying food and disappearing into the heather around 150m north of the nest site while nearby a juvenile was heard chacking from a clump of heather. Further visits were made to the pit but no second nest was found.

Sturdy Bank

The nest was located on 27th April on the east side of the gill near the top. The female was in the process of constructing the nest and was seen collecting moss and dry grass from the bottom of the gill and when later checked looked dark and damp in the bottom. The male appeared to be on guard during the construction process and took no part in building the nest. The nest was on a steep slope in a heather bush and could easily be seen by looking in to the bush from above. Inspection on the 29th suggested the nest was now complete with the depth of the cup being half of what it was on the 27th. A visit on the 2nd May found 3 eggs putting the first-egg date at 30 April; no more than two days after the nest was completed. Visits were made to the nest daily and a photographic record made of the hatchlings development - the nest was not approached just prior to fledging to prevent the young leaving the nest prematurely. The young successfully fledging on the 29th May. On 7th June 3 fledglings were seen in the gill being tended to by the male. A second nest was located on 16th June on the west side of the gill containing two eggs that were found to be cold and close by a discarded egg shell. The nest had been predated at the egg stage and the adults were clearly distressed with both observed staring in to the nest. On close inspection one of the eggs was found to have a small hole in it; the culprit is unknown but a similar situation occurred at Hob Crag in 2003 which after discussion with the keeper was attributed to predation by a brown rat (*Rattus norvegicus*).

Passage Migrants

On 21st April 14 ring ouzels were seen at Danby Head in Danby Dale (NZ682037), most were likely to be on passage but a resident pair were thought to have been amongst them. A single ring ouzel was seen on Lockton High Moor (SE865965) on 22nd April at a site where Spring passage birds have been regular visitors in previous years. On the same day 9 were seen in Rosedale above Moorlands Farm (SE68289884), most were males but two were identified as females; all were feeding in a meadow above the farm while a 'local' male (shown to be a Rosedale bird from the sonogram recording) was singing from a wall nearby. Up to 5 birds were seen at Head House, Snilesworth Moor (SE535973) on 29th April along with resident pair.

Late Summer Activity

As in the last few years a late season visit was made to Rosedale specifically to locate ring ouzels prior to migration. A visit was made on 2nd September to the east side of the dale around Reeking Gill and Dalehead and to the west around Blakey Swang. Results were disappointing with just one male seen at Reeking Gill in a rowan tree below the embankment and a while later in the same tree a female was seen that looked from the condition of the feathers around the neck to be in the final stages of moult.

Analysis of 2010 Audio Recordings

Detailed studies carried out in the Yorkshire Dales by Ian Appleyard and in Scotland by David Stemple point to the male ring ouzel simple song being microgeographic. As such the song is shared by all members of a local group and is not sung by those in neighbouring groups. A male's song, or dialect, can therefore be linked to a particular geographic area.

A start was made in 2008 on creating an audio database of songs sung by male ring ouzels in the North York Moors. The aim was to use the sonogram of each bird's song to define a unique set of characteristics that would enable it to be identified and thus tracked. To date over 70 recordings have been made of Rosedale ring ouzels with a further nine recorded in Bransdale and one each in Farndale and Northdale.

The dialect of a male ring ouzel from Rosedale is shown in the sonogram below (Figure 5). Analysis of all the Rosedale recordings made to date suggests the characteristic shape of the sonogram is typical of a bird from that dale. As such it can be regarded as the homologous song type for a Rosedale male ring ouzel.

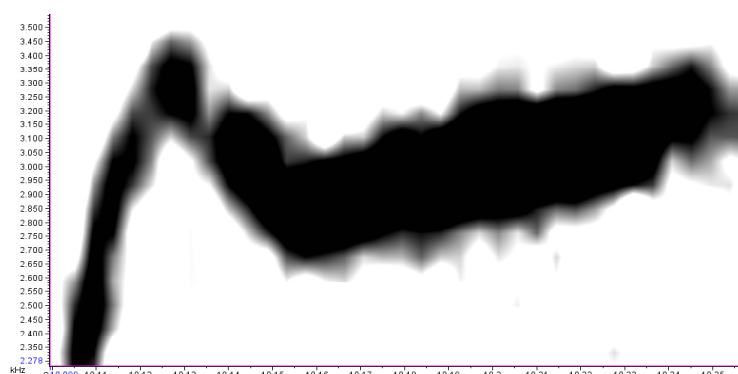


Figure 5: Sonogram of male ring ouzel with typical Rosedale dialect recorded at Bank Top, Rosedale, on 23rd April 2003 by David Stemple.

An unusual audio recording was made in Rosedale on 12th April 2010 (Figure 6). The male was first recorded at Round Hill and from analysis of the sonogram it was clear that it did not have a Rosedale dialect. A recording of a male made a week later on the other side of the dale some 3.5 km north of Round Hill at Reeking Gill had similar characteristics. The similarity of both

recordings suggests it was the same male. There were no further recordings made during the season of this bird. The geographic location of this dialect is unknown and it is just possible that it was a passage bird; the timing was right with other passage birds noted in the area around this time - though it is unusual for males on passage to sing.

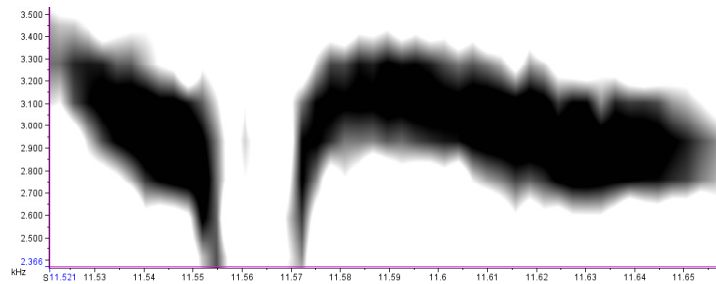


Figure 6: Sonogram of male ring ouzel with unidentified dialect recorded in Rosedale at Round Hill on 12th April and a week later 3.5km north near Reeking Gill. Both recordings are likely to be the same male.

An interesting audio recording was made on 3rd June of two males counter-singing in the disused quarry on the east side of Rosedale at Dalehead. One bird had a classic Rosedale dialect while the other had a sonogram form that looked very similar to a male recorded 2km west of the quarry at Gill Wath (SE669997) in Farndale on 30th April 2009 (Figure 7). This was the first time a male with a dialect associated with another dale had been recorded in Rosedale and moreover was identified as the male nesting in the Dalehead quarry. Most male ring ouzels appear to be site faithful, returning to their natal site to breed. This observation suggests a degree of mobility taking place with movement between adjacent dales occurring from time to time. It will be of great interest to look at audio recordings in the coming years to see if there is a suggestion of a Farndale dialect in future generations of Rosedale males; something that little is known about.

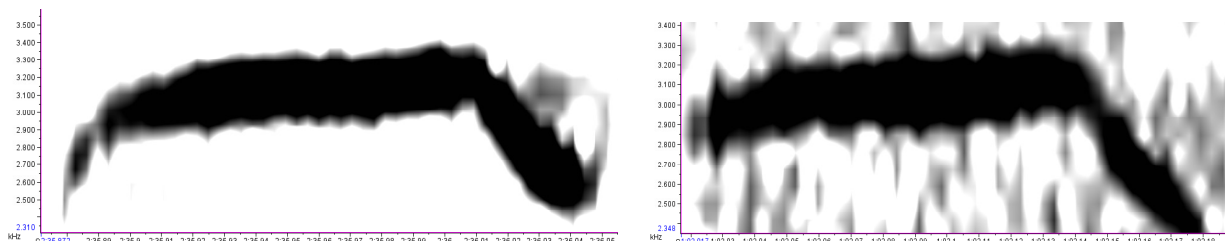


Figure 7: Sonogram (left) of a male ring ouzel with Farndale type dialect that nested in 2010 on the east side of Rosedale at Dalehead quarry showing a remarkable similarity to the sonogram (right) of male recorded 2km west of the quarry at Gill Wath, Farndale, in 2009.

6. ACKNOWLEDGEMENTS

The authors wish to acknowledge the considerable help of a local resident and the support of estate owner George Winn-Darley and head keeper George Thompson. Also to Mick Carroll, Tom Denney, John Knight, Jim Pewtress, Chris Tyas and Peter Waterton for reports of ring ouzel sightings during the 2010 season. Our grateful thanks to all of them.

7. REFERENCES

- Appleyard, I. (1994) Ring Ouzels of the Yorkshire Dales.
- Gibbons, D.W., Reid J. B. and Chapman, R. A. (1993) The new atlas of breeding birds in Britain and Ireland: 1988-1991. T. & A.D. Poyser Ltd, London.
- Stemple, D. (2005) Ring Ouzel Songs. www.cs.umass.edu/~stemple/RZ/RZdialects.html

ANNEX 1 - Map of Nest Sites and Territories in Rosedale in 2010

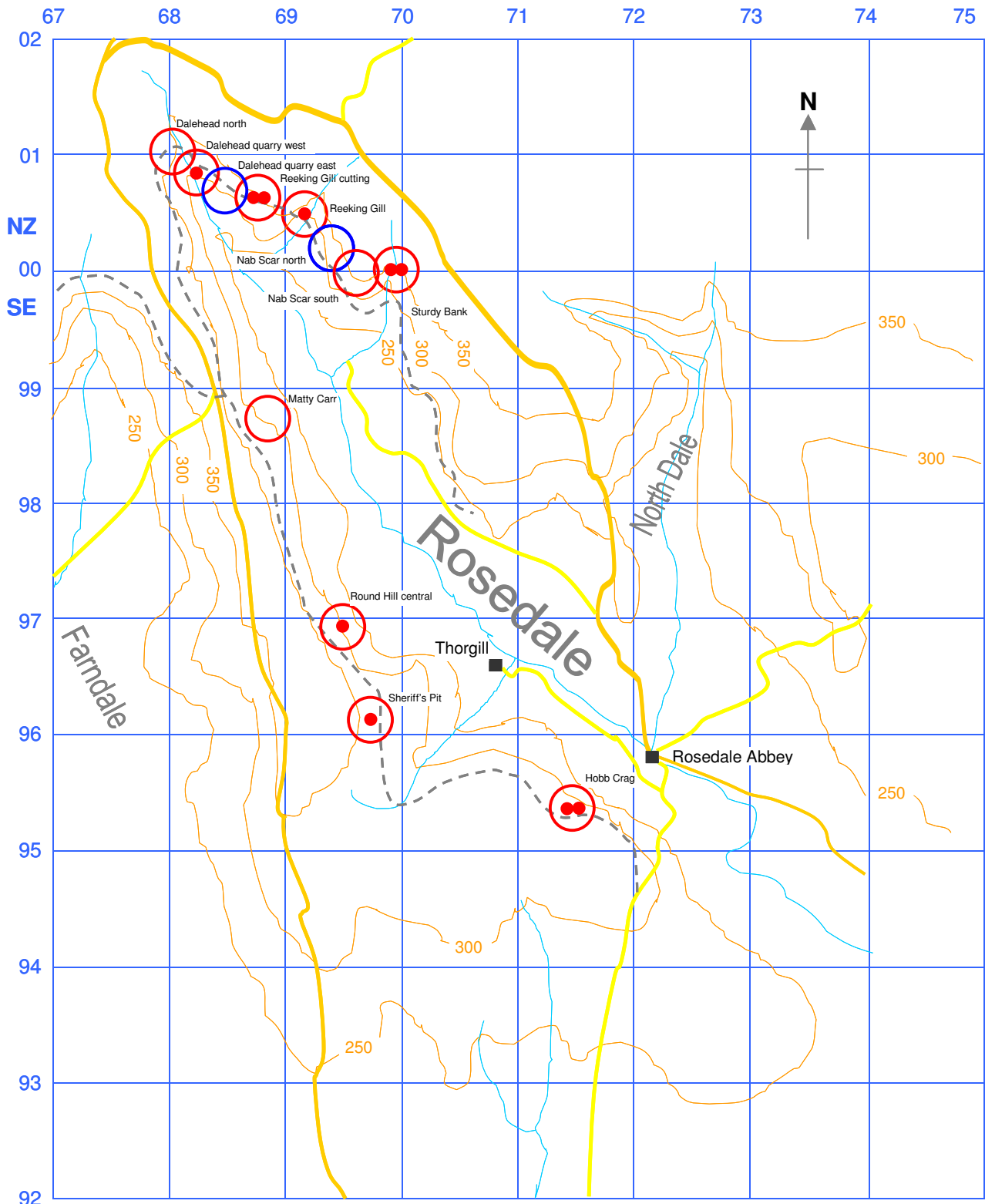
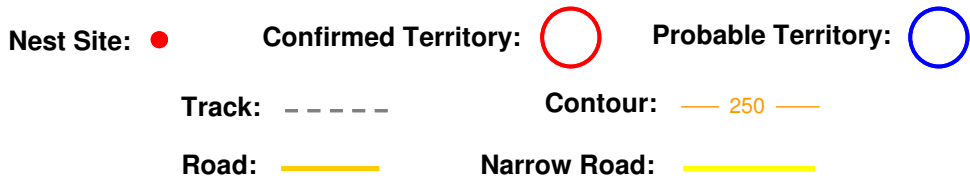
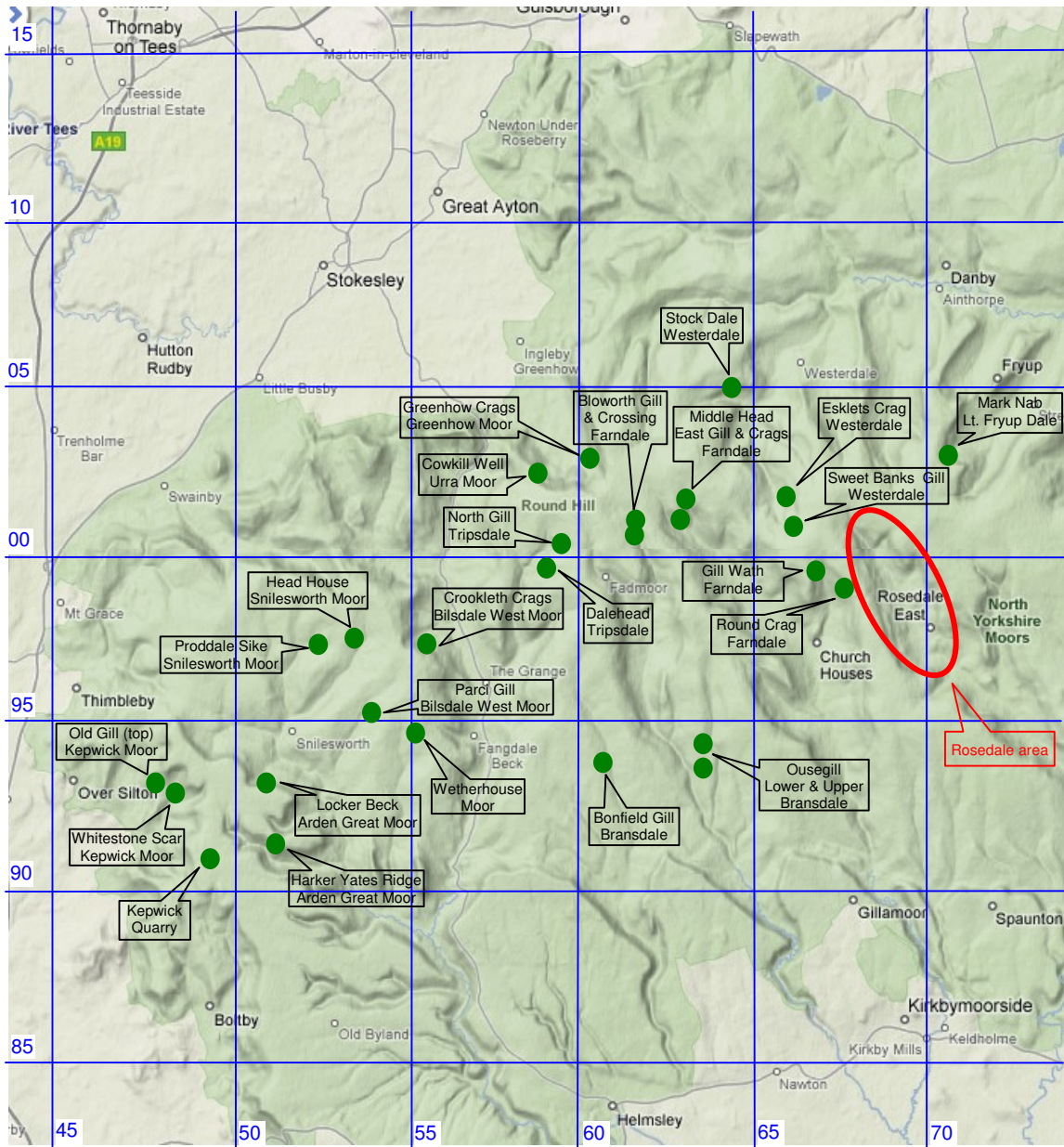


Diagram 1: Ring ouzel nest sites and Confirmed & Probable territories located in the Rosedale area of the North York Moors in 2010.



ANNEX 2 - Map of Sightings on the North York Moors in 2010 (other than the Rosedale area & passage migrants)



**ANNEX 3 - Table of Sightings on the North York Moors in 2010
(other than the Rosedale area)**

Record No	Date	Time	Grid Ref/place name		Elevation	Comment
1	30/03/2010	08:24	SE640947	Ousegill Bridge	245	Male in song
2	31/03/2010	8.49	SE 487928	Whitestone Scar	350m	Male on territory
3	11/04/2010	8.49	SE61059345	Bonfield Gill	235m	Male on territory
4	12/04/2010	10.31	SE587998	Tripsdale Hd - E gully	c.300m	Male on territory
5	12/04/2010	11.35	NZ591003	North Gill sheepfold	340m	Pair feeding
6	12/04/2010	11.53	NZ593002	Tripsdale Head	362m	Pair in flight
7	13/04/2010	8.27	NZ63140181	Middle Head - E gill	356m	Male on territory
8	13/04/2010	8.42	NZ634014	Middle Head - E gill	c.300m	Male on territory
9	13/04/2010	9.05	NZ629010	Middle Head Crags	c.290m	Pair together
10	14/04/2010	7.45	NZ66120190	Esklets Crags - mid	322m	Male in song
11	14/04/2010	8.05	NZ662015	Esklets Crags - south	c.320m	Pair on territory
12	14/04/2010	8.32	NZ66160101	Sweet Banks Gill	c.320m	Male on territory
13	15/04/2010	7.56	NZ64590506	Stock Dale N slope	300m	Pair on territory
14	21/04/2010	7.17	NZ684036	High Crag/St Helena	320m	14 birds in total
15	21/04/2010	12.05	NZ714028	Mark Nab	350m	Single - female?
16	22/04/2010	06:56	SE64049425	Ouse Gill - lower	218m	Single male
17	22/04/2010	07:03	Above up to bridge at SE639946	Ouse Gill - lower	220-230m	3 birds - 1m & 2 f?
18	22/04/2010	08:38	SE64019509	Ouse Gill - upper	261m	Pair. Like Record 1
19	22/04/2010	07:51	SE64009553	Ouse Gill - upper	270m	Single male
20	23/04/2010	06:45	SE677992	Round Crag	320m	Single male
21	23/04/2010	07:50	SE669996	Crag SW of Gill Wath	340m	Single male
22	24/04/2010	07:30	SE482934	Gill to NW WS Scar	?	Single calling bird - not seen
23	24/04/2010	07:54	SE502935	Arden Great Moor	?	Singing male - not seen
24	24/04/2010	08:28	SE503931	Arden Great Moor - gill above Locker Woods	350m	Pair on territory
25	24/04/2010	09:02	SE508921	Arden Great Moor - gill to E of Harker Yates Ridge	310m	Pair on territory
26	24/04/2010	12:22	SE486909	Clarke Scars - North	c.310m	5 birds (3m & 2f?)
27	24/04/2010	12:40	SE486914	Kepwick Quarry	c.350m	2 birds (1m & 1f)
28	29/04/2010	07:55	SE520969	Proddale Sike	280m	Single male
29	29/04/2010	10.41-11.45	SE535973	Head House in-bye	330m	Pair and up to 5 other (passage?) birds
30	30/04/2010	07:35	SE537955	Parci Gill - mid	310m	Single male
31	30/04/2010	08:39	SE554971	Crookleth Crags - west	330m	Single male
32	30/04/2010	11:10	SE553947	Wetherhouse in-bye	335m	Pair
33	01/05/2010	06:47	NZ581021	Cowkill Well	340m	Single male
34	01/05/2010	09:38	NZ61570099	Bloworth gill	370m	Pair on territory
35	01/05/2010	10:03	NZ616015	Bloworth Crossing	400m	3 males, 2 females
36	01/05/2010	10:44	NZ60480344	Greenhow Bank crags	370m	Single bird (male?)
37	05/05/2010	08:44	NZ715018	Yew Grain Scar	380m	Single male
38	08/05/2010	11:30	SE497923	East arm of unnamed gill West of Wild Middle	340m	Single male

The data and comments in the above table are taken from a detailed report produced by Chris Tyas.

ANNEX 4 - Annual Breeding Results from 2000 to 2010

Table 1: Annual breeding results at ring ouzel nest sites in the Rosedale and other areas of the North York Moors. Data from 2000 to 2010.

Year	Site	Grid Ref.	Eggs	Hatched	Fledged	Comments
2000	Spaunton	SE71479347	4	4	4	1 st brood. 4 pulli ringed.
2002	Bank Top	?	?	?	?	First attempt not found.
2002	Bank Top	SE72049483	+	4	4	Likely to be 2 nd brood.
2003	Ouzegill Bdg.	SE63709450	4	4	4	1 st brood. 4 pulli ringed.
2003	Round Hill	SE69279710	4	4	4	1 st brood
2003	Thorgill Head	SE69999559	4	3	0	1 st brood. Nest disturbed, chicks abandoned.
2003	Thorgill Bank	SE70729582	4	3	3	1 st brood. 3 pulli ringed.
2003	Thorgill Bank	SE70729582	2	1	?	2 nd brood. Likely to have failed at pulli stage.
2003	Loskey Ridge	SE71489347	4	+	0	1 st nest. Predated at pulli stage.
2003	Hob Crag	SE71459538	4	0	0	Likely to be 1 st nest. Predated at egg stage.
2004	Hob Crag	SE71459538	4	4	0	Predated at pulli stage. Refurbished 2003 nest.
2004	Matty Carr	SE68809833	4	4	4	Likely to be 1 st brood.
2004	Dale Hd East	?	?	?	?	First attempt not found
2004	Dale Hd East	NZ68560086	4	4	4	Likely to be 2 nd brood.
2004	Ouzegill Bdg.	SE63909470	2	1	?	1 st brood. 1 egg vanished. 1 pulli ringed.
2005	Sheriff's Pit 1	SE69659631	+	1	0	1 st nest. Nest abandoned; reason unknown.
2005	Sheriff's Pit 2	SE69659631	+	0	0	2 nd attempt. Predated at egg stage.
2005	Sheriff's Pit 3	SE69659631	+	3	2	3 rd nest.
2005	Matty Carr	SE68809835	4	4	4	Thought to be 1 st brood.
2005	Lion Inn	?	?	?	?	First attempt not found
2005	Lion Inn	SE68249954	+	4	4	Likely to be 2 nd brood.
2005	Dale Hd West	NZ67960082	+	+	3	3 fledglings seen near nest.
2006	Sheriff's Pit 1	SE69659631	4	0	0	Nest on NW side of pit shaft washed out by heavy rain in mid May.
2006	Sheriff's Pit 2	SE69779609	5	5	5	Second attempt 185m Sth. of pit shaft.
2006	Dale Hd West	?	?	?	?	First attempt not found
2006	Dale Hd West	NZ67930081	4	?	?	Likely to be 2 nd brood.
2007	Hob Crag	SE71459538	3	0	0	1 st nest. Predated at egg stage.
2007	Round Hill Sth	SE69819663	4	4	4	1 st nest.
2007	Dale Hd West	NZ67940079	4	4	4	1 st nest.
2007	Reeking Gill	NZ68920066	4	4	4	1 st nest.
2008	Sturdy Bank 1	SE69899991	4	4	4	1 st nest.
2008	Sturdy Bank 2	SE69869990	4	4	3	2 nd nest.
2008	Round Hill Sth	SE69819664	4	4	4	1 st nest. Used refurbished 2007 nest.
2008	Reeking Gill	NZ69140056	5	5	5	1 st nest.
2008	Northdale, W. Gill	SE71799957	+	+	3	1 st nest.
2008	Hobb Crag 1	SE71449539	4	4	0	1 st attempt. Predated at pulli stage. Used same nest site as in 2003/4.
2008	Hobb Crag 2	SE71399545	3	0	0	2 nd attempt. Predated at egg stage.
2008	Sheriff's Pit	SE69719626	4	4	4	1 st brood.
2008	Dalehead Nth.	?	?	?	?	First attempt not found.
2008	Dalehead Nth.	NZ67950102	4	1	0	Likely to be 2 nd attempt. Appeared to have failed after 1 st hatching. 1 abandoned egg left in nest.
2009	Dale Hd West	NZ67940079	4	4	4	1 st nest.
2009	Sturdy Bank	SE69879991	4	4	3	Likely to be 1 st nest.
2009	Round Hill Sth	SE69539674	4	4	4	1 st nest.
2009	Reeking Gill	NZ69240076	+	+	3	1 st nest.
2009	Sheriff's Pit	SE69729627	+	5	5	2 nd nest. 1 st nest at Round Hill Sth.
2010	Ouzegill 1	SE64009511	4	4	3	1 st nest. 1 left early & died near nest.
2010	Ousegill 2	SE63989497	5	3	0	2 nd nest 140m south of first nest. Nest predated at pulli stage. 2 eggs left in nest.
2010	Ousegill Bridge	?	?	?	?	First attempt not found.
2010	Ousegill Bridge	SE63929444	5	0	0	Likely to be 2 nd nest. Predated at egg stage.
2010	Sturdy Bank 1	NZ69890000	3	3	3	1 st nest.
2010	Sturdy Bank 2	NZ69870005	3	0	0	Predated at egg stage.
2010	Reeking Gill	NZ69080068	+	4	4	1 st nest.
2010	Reeking Gill cut 1	NZ68790066	4	4	4	1 st nest.
2010	Reeking Gill cut 2	NZ68860068	+	3	3	2 nd nest 69m east of first nest.
2010	Dalehead (quarry west)	NZ68280082	+	+	+	1 pulli seen in nest. 2+ fledglings seen nearby.
2010	Hob Crag 1	SE71389544	+	4	4	1 st nest.
2010	Hob Crag 2	SE71389544	+	4	2	2 nd nest using same nest as 1 st nest.
2010	Sheriff's Pit	SE69739627	+	3	3	1 st nest.
2010	Round Hill (central)	SE69439690	+	4	4	1 st nest.

? = No data. + = Exact value unknown.

ANNEX 5 - Table of Nest Aspect & Elevation

Table 1: Aspect & elevation of 51 ring ouzel nest sites mainly in the Rosedale area of the North York Moors.

Year	Location	Grid Reference	Aspect	Elevation
1999	Rosedale - Sheriff's Pit	SE 6973 9627	NNW	331m
1999	Blakey Crossing	SE 6830 9900	SSW	370m
2000	Spaunton Moor - Penwash	SE 7147 9347	SSW	240m
2002	Rosedale - Bank Top	SE 7204 9483	NNW	310m
2003	Rosedale - Round Hill	SE 6927 9710	N	336m
2003	Rosedale - Hobb Crag	SE 7145 9538	NNE	313m
2003	Rosedale - Thorgill Head	SE 6999 9559	NNE	330m
2003	Rosedale - Thorgill Bank	SE 7073 9580	NE	308m
2003	Spaunton Moor - Penwash	SE 7148 9347	NE	249m
2003	Rosedale - Thorgill Bank	SE 7072 9582	ENE	309m
2004	Rosedale - Matty Carr Hill	SE 6880 9833	E	358m
2004	Rosedale - Sheriff's Pit	SE 6971 9626	SSE	331m
2004	Rosedale - DaleHead (east)	NZ 6856 0086	SW	330m
2005	Rosedale - Sheriff's Pit	SE 6971 9626	NE	339m
2005	Rosedale - Blakey Lion	SE 6824 9954	ENE	362m
2005	Rosedale - Dale Head (west)	NZ 6796 0082	E	349m
2005	Rosedale - Sheriff's Pit	SE 6971 9626	ESE	333m
2005	Rosedale - Matty Carr Hill	SE 6880 9835	SE	331m
2005	Rosedale - Sheriff's Pit	SE 6971 9626	SW	331m
2006	Rosedale - Sheriff's Pit (south)	SE 6979 9610	N	339m
2006	Rosedale - Dale Head (west)	NZ 6793 0080	E	362m
2006	Rosedale - Sheriff's Pit	SE 6971 9626	ESE	333m
2007	Rosedale - Reeking Gill (west)	NZ 6892 0066	N	321m
2007	Rosedale - Round Hill (south)	SE 6981 9664	NNE	297m
2007	Rosedale - Hob Crag	SE 7138 9546	E	313m
2007	Rosedale - Dale Head (west)	NZ 6794 0079	S	357m
2008	Rosedale - Round Hill (south)	SE 6981 9664	NNE	297m
2008	Rosedale - Hob Crag 1	SE 7144 9539	NNE	310m
2008	Rosedale - Hob Crag 2	SE 7139 9545	NE	313m
2008	North Dale - West Gill	SE 7179 9957	NE	308m
2008	Rosedale - Dalehead (north)	NZ 6795 0102	NE	353m
2008	Rosedale - Sheriff's Pit	SE 6971 9626	SSE	331m
2008	Rosedale - Sturdy Bank 1	SE 6989 9991	W	307m
2008	Rosedale - Sturdy Bank 2	SE 6986 9990	SSW	281m
2008	Rosedale - Reeking Gill	NZ 6914 0056	W	322m
2009	Rosedale - Reeking Gill	NZ 6924 0076	S	359m
2009	Rosedale - Sturdy Bank	SE 6987 9991	SW	282m
2009	Rosedale - Dale Head (west)	NZ 6794 0079	S	357m
2009	Rosedale - Round Hill (south)	SE 6953 9674	NE	330m
2009	Rosedale - Sheriff's Pit	SE 6972 9627	NE	345m
2010	Rosedale - Sturdy Bank	NZ 6988 0004	W	324m
2010	Rosedale - Hob Crag (1 & 2)	SE 7138 9544	NE	315m
2010	Rosedale - Sheriff's Pit	SE 6973 9627	NE	340m
2010	Rosedale - Round Hill (central)	SE 6943 9690	ENE	328m
2010	Rosedale - Reeking Gill	NZ 6908 0068	SE	317m
2010	Rosedale - Reeking Gill cutting 1	NZ 6879 0066	S	328m
2010	Rosedale - Reeking Gill cutting 2	NZ 6886 0068	SE	329m
2010	Rosedale - Dalehead (quarry west)	NZ 6828 0082	S	281m
2010	Bransdale - Ousegill 1	SE 6400 9511	W	250m
2010	Bransdale - Ousegill 2	SE 6398 9497	E	250m
2010	Bransdale - Ousegill Bridge	SE 6392 9444	W	225m

ANNEX 6 - Nest Aspect & Elevation Profile

Number of nests facing:-

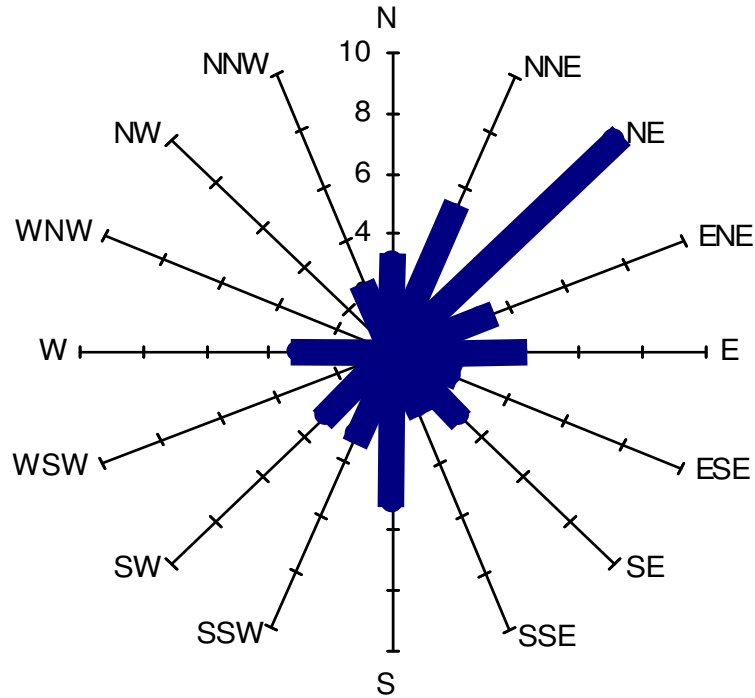


Figure 1: Number of nests facing principal compass points in the Rosedale area of the North York Moors. Data from 1999 to 2010, n=48 nests.

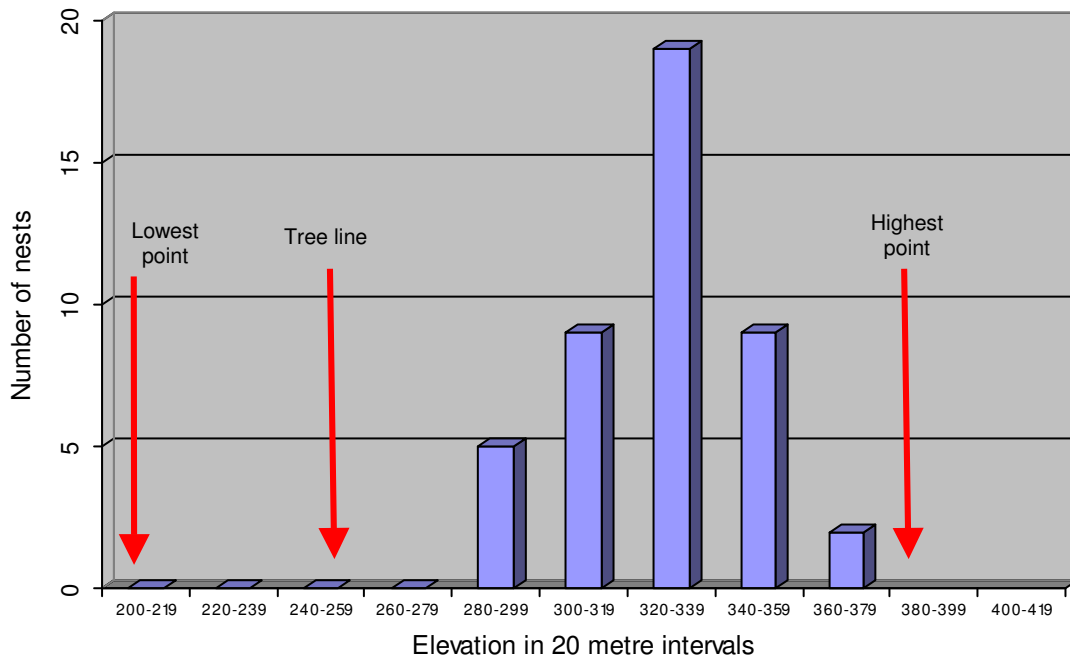
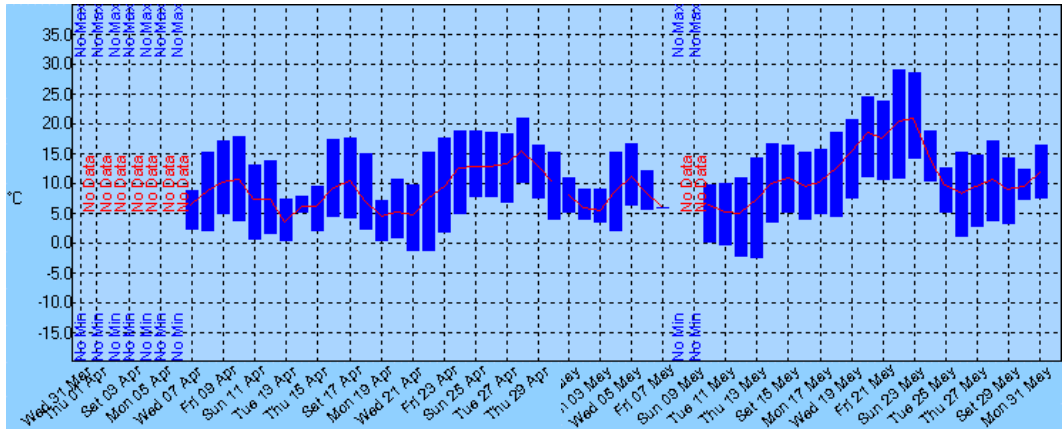
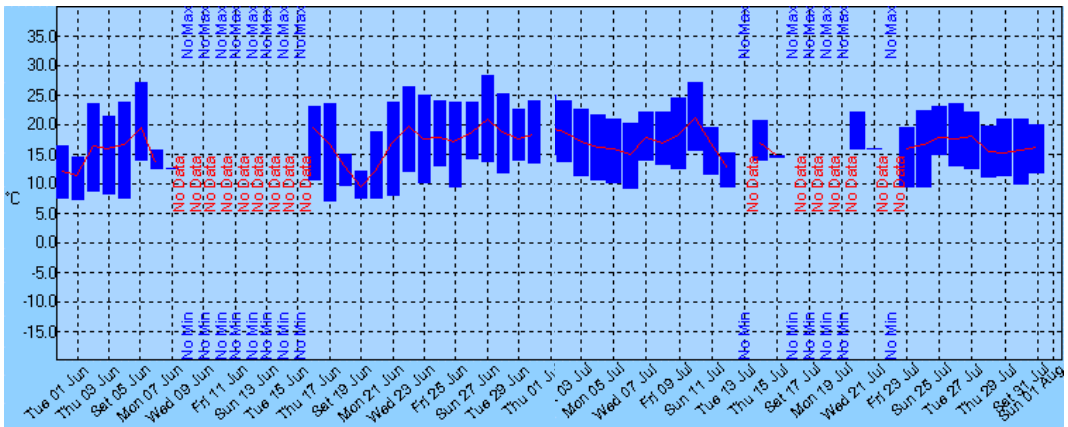


Figure 2: Elevation profile of nests in Rosedale, North York Moors. Data from 1999 to 2010, n=44 nests.

ANNEX 7 - Daily Max & Min Temperature for the Months April to July



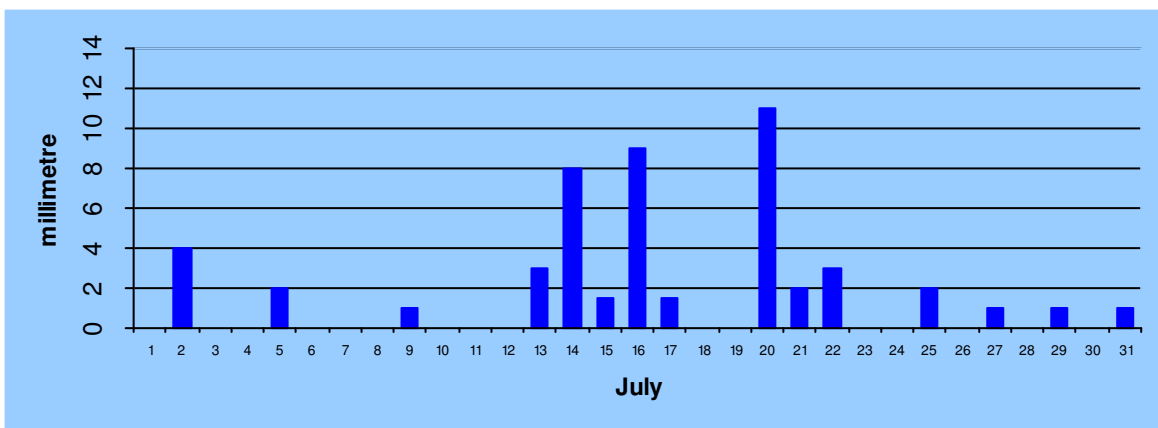
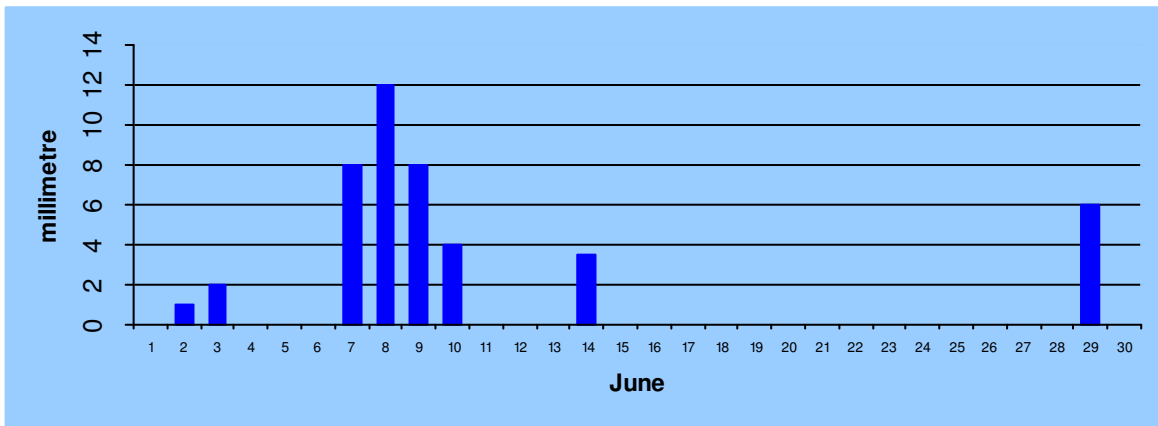
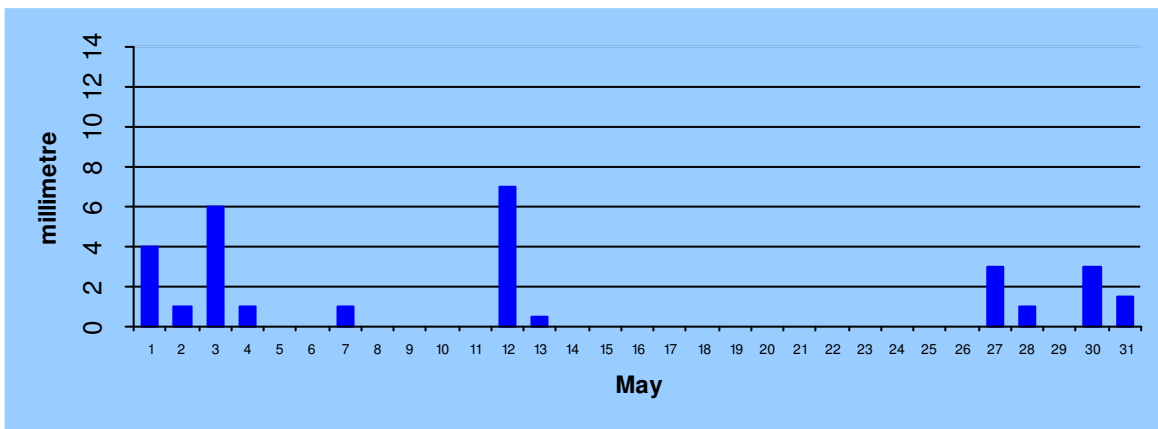
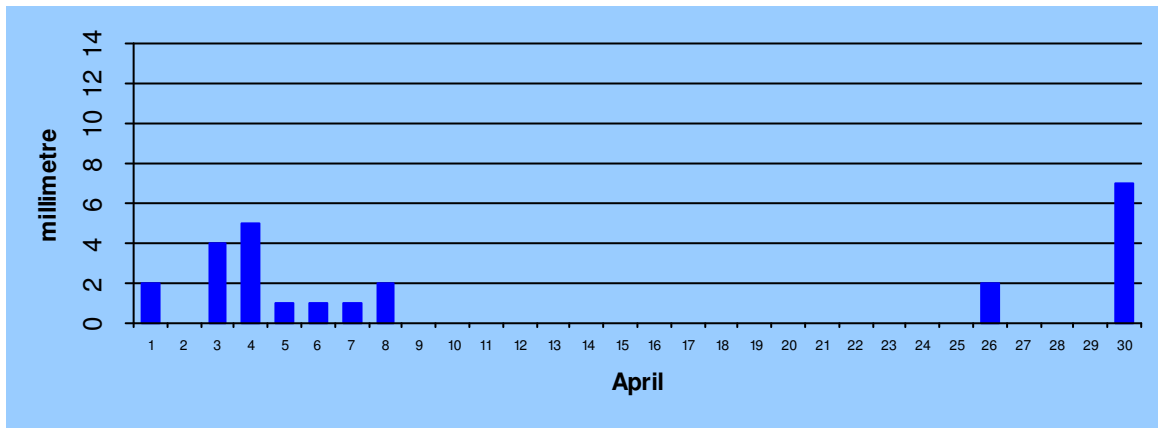
April - May



June - July

Daily maximum and minimum temperature recorded at Scaling Dam, NZ741126, altitude 190m, in 2010.

ANNEX 8 - Daily Rainfall for the Months April to July



Daily rainfall recorded at Rudland, SE664917, altitude 210m, in 2010.