

RING OUZEL REPORT 2013



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

Summary of 2013 Report on Page 3

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Front-page photos

Top: first-year juvenile ring ouzel, Nab Scar south, Rosedale, 6th July 2013.
Bottom: ring ouzel hatchling just emerging from egg, Round Hill south, Rosedale, 1st July 2013.

1. SUMMARY OF 2013 RING OUZEL REPORT

- 1. First-arrival recorded at Reeking Gill on 29th March** (5.2, Pg. 15)
 - 2. Second highest record of breeding pairs with 20 territories recorded** (5.3, Pg. 16)
 - 3. Cold start to breeding season delayed laying** (4.4, Pg. 10)
 - 4. Nest productivity recovered well after previous year's poor result** (4.3, Pg. 8-9)
 - 5. 65% of eggs laid in 2013 produced chicks that successfully left the nest** (5.4, Pg. 25)
 - 6. First time pair found nesting on moor plateau** (5.3.10, Pg. 20)
 - 7. Pair foraging at East Mines seen taking food 1.5 km to nest in Northdale** (5.3.5, Pg. 18)
 - 8. New graphs overlaying local climate data and first-egg laying dates** (4.4, Fig. 5-6, Pg. 11)
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2. INTRODUCTION

The 2013 survey was the 14th 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. 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 2013 survey concentrated on the Rosedale area of the North York Moors; an area of around 25 sq/km. And as for the last few years, visits were made during late summer to locate ring ouzels prior to migration.

The 2013 season marked 12 years of unbroken study in the Rosedale area; only the foot and mouth outbreak in 2001 and the subsequent closure of the moors prevented continuous study since the start of the project in 1999.

As in previous years the north-west and east side of the dale was covered by Vic Fairbrother and the west side by Ken Hutchinson.

Finally, with increasing concern for the impact on wildlife from climate change this report includes more detailed data on local and regional weather. Both mean temperature and total rainfall are shown in chart form for the Spring period and the month of April; the key month for ring ouzel first nests and eggs. Local weather data has then been overlaid on charts showing the earliest first-egg date for each year since 2009 in respect of April mean temperature and total rainfall. By merging both sets of data in this way any correlation between climatic events and breeding activity may become apparent.

3. METHODOLOGY

3.1 Breeding Status Criteria

The criteria used to determine the existence of a territory is shown in the table below using the categories defined by the British Trust for Ornithology (BTO) for determining breeding evidence.

BREEDING STATUS	CRITERIA
Possible	<ul style="list-style-type: none">• Single bird observed in suitable nesting habitat.• Male seen or heard singing on one survey date only.
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.• Agitated behaviour.
Confirmed	<ul style="list-style-type: none">• Nest found with eggs or chicks.• Recently fledged young seen.• Adult seen carrying food.

3.2 Fledging Criteria

An assessment of whether a brood fledged successfully is made using the ‘outcome success’ criteria of the BTO Nest Record Scheme as appropriate.

- Young fledged nest on approach.
- Fledged young near nest.
- Adult carrying food to fledged young near nest.
- Adult visibly agitated/alarming as if fledged young are near nest.
- Nest empty and undisturbed with well-trodden lining, containing feather scale and/or droppings.
- Young capable of leaving nest on penultimate visit.

Ring Ouzel chicks remain relatively settled when in the nest but can ‘explode’ from the nest when approached close to fledging. For that reason nests are not generally inspected the day before the estimated fledging date in order to avoid this premature fledging.

In view of this and unless there is evidence to the contrary, such as obvious signs of predation, all nestlings present on the penultimate visit are considered to have fledged if the nest is empty on the later final visit.

The discovery of small groups of droppings in sheltered locations in the vicinity of the nest has also been noted as supporting evidence that fledglings have been hidden there for a time after leaving the nest.

3.3 Definition of Study Area

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

4. RESULTS

4.1 Territories

4.1.1 Rosedale Area

Table 1: Breeding ring ouzel territories in the Rosedale area between 1999 and 2013.

	Location (all territories recorded to date)	Grid Ref.	Year													
			99	00	02	03	04	05	06	07	08	09	10	11	12	13
1.	Spaunton Moor - Spindle Thorn	SE 716 930	?	*	✓	*	*	*	*	*	✓	*	*	?	✓	✓
2.	Spaunton Moor - Spaunton Knowl	SE 717 918	?	?	?	?	?	?	?	?	?	?	?	?	✓	*
3.	Spaunton Moor - Loskey Ridge west	SE 714 934	?	✓	✓	✓	*	*	✓	*	*	*	*	?	*	*
4.	Spaunton Moor - Loskey Ridge east	SE 715 935	?	*	*	✓	✓	✓	*	*	*	*	*	?	*	*
5.	Rosedale west - Bank Top	SE 720 951	✓	✓	✓	✓	*	*	✓	*	*	*	*	✓	✓	✓
6.	Rosedale west - Bank Top (east)	SE 725 945	?	*	*	✓	*	✓	*	*	*	*	*	*	*	*
7.	Rosedale west - Hob Crag quarry	SE 714 954	?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
8.	Rosedale west - Hob Crag north	SE 712 956	*	*	*	*	*	*	*	*	*	*	*	✓	*	✓
9.	Rosedale west - Thorgill Bank	SE 707 958	?	*	*	✓	*	*	✓	*	*	*	*	*	✓	✓
10.	Rosedale west - Thorgill Head	SE 670 956	?	*	✓	✓	✓	✓	*	*	*	*	*	*	*	*
11.	Rosedale west - Sheriff's Pit	SE 697 963	✓	✓	✓	*	✓	✓	✓	*	✓	✓	✓	✓	✓	✓
12.	Rosedale west - Sheriff's Pit (south)	SE 698 961	*	*	*	*	*	*	✓	*	*	*	*	*	*	*
13.	Rosedale west - Round Hill (south)	SE 694 968	?	*	✓	✓	✓	✓	✓	✓	✓	✓	*	*	✓	✓
14.	Rosedale west - Round Hill (west)	SE 693 971	*	*	✓	*	*	*	*	*	*	*	*	✓	✓	✓
15.	Rosedale west - Round Hill (north)	SE 693 974	?	*	*	*	*	*	*	✓	*	*	*	*	*	*
16.	Rosedale west - Round Hill (east)	SE 694 970	?	*	✓	✓	✓	*	*	✓	✓	✓	✓	✓	✓	*
17.	Rosedale west - Sledge Shoe Bents	SE 691 978	?	✓	✓	✓	✓	✓	✓	*	*	✓	*	✓	✓	✓
18.	Rosedale west - Matty Carr	SE 688 984	?	*	*	✓	✓	✓	✓	✓	✓	*	✓	✓	✓	✓
19.	Rosedale west - Matty Carr (south)	SE 690 980	?	*	*	*	*	✓	*	✓	*	*	*	*	✓	*
20.	Rosedale west - Lion Inn (north)	SE 680 999	*	*	*	*	*	*	*	*	*	*	*	*	*	✓
21.	Rosedale west - Lion Inn (south)	SE 681 999	*	✓	✓	✓	*	✓	*	✓	*	*	*	*	✓	✓
22.	Rosedale west - Blakey Swang	SE 685 998	?	?	?	?	?	?	?	?	✓	*	*	*	*	*
23.	Rosedale west - Dalehead (north)	NZ 680 013	✓	*	✓	*	✓	*	*	*	✓	*	✓	✓	✓	*
24.	Rosedale west - Dalehead (west)	NZ 680 008	*	*	✓	✓	✓	✓	✓	✓	*	✓	*	✓	✓	✓
25.	Rosedale east - Dalehead (east)	NZ 686 008	*	*	*	✓	✓	*	*	*	*	*	*	✓	*	*
26.	Rosedale west - Dalehead (south)	NZ 682 005	*	*	✓	*	*	*	*	*	*	*	*	*	*	*
27.	Rosedale east - Dalehead (quarry east)	NZ 685 006	*	*	*	*	*	*	*	*	*	*	✓	*	*	*
28.	Rosedale east - Dalehead (quarry west)	NZ 683 008	*	*	*	*	*	*	*	*	*	*	✓	✓	✓	✓
29.	Rosedale east - Reeking Gill (cutting)	NZ 688 007	*	*	*	*	*	*	*	✓	✓	*	✓	*	✓	✓
30.	Rosedale east - Reeking Gill	NZ 691 007	✓	✓	✓	*	*	✓	✓	✓	✓	✓	✓	✓	✓	✓
31.	Rosedale east - Reeking Gill quarry	NZ 692 005	*	*	*	*	*	*	*	*	*	*	*	*	*	✓
32.	Rosedale east - Reeking Gill (south)	NZ 692 003	*	*	*	*	*	*	*	*	*	*	*	✓	✓	✓
33.	Rosedale east - Nab Scar (north)	NZ 694 000	*	✓	*	✓	✓	✓	✓	✓	*	✓	✓	✓	✓	✓
34.	Rosedale east - Nab Scar (south)	SE 695 999	*	*	*	*	*	*	*	*	*	*	✓	*	✓	*
35.	Rosedale east - Sturdy Bank	NZ 699 000	✓	✓	✓	✓	*	*	*	*	✓	✓	✓	✓	✓	✓
36.	Rosedale east - East Mine	SE 705 989	?	?	?	?	?	?	?	?	✓	*	*	*	✓	*
TOTAL			5	9	16	16	12	13	12	11	12	9	12	16	23	20
1). Only a partial survey was carried out in 1999. 2). Foot & mouth prevented field work in 2001.																
✓ = occupied by pair * = not occupied ? = not checked																

See map at **Annex 1** for the location of ring ouzel territories and nests in Rosedale in 2013.

4.1.2 Other Areas of the North York Moors

The map at **Annex 2** shows the approximate location where ring ouzels were recorded on the North York Moors in 2013 - other than the Rosedale area and passage migrants.

A member of the Tees Ringing Group reported four pulli being ringed at Ingleby incline (NZ6002) in the week prior to 20th June.

4.2 Nest Sites

Table 2: Summary of ring ouzel nest sites monitored in Rosedale in 2013.

No.	Location	Grid Ref.	Outcome	Comment
1.	Rosedale west - Sheriff's Pit 1.	SE69729626	Fledged.	1 st nest.
2.	Rosedale west - Sheriff's Pit 2.	SE69729626	Fledged.	2 nd nest.
3.	Rosedale west - Round Hill west	SE69259705	Fledged.	Likely to be late 1 st nest.
4.	Rosedale west - Round Hill south 1.	SE69689671	Fledged.	1 st nest.
5.	Rosedale west - Round Hill south 2.	SE69599670	Fledged.	2 nd nest.
6.	Rosedale west - Blakey Lion north	SE68049997	Fledged.	1 st nest.
7.	Rosedale west - Dalehead west	NZ67940079	Fledged.	1 st nest.
8.	Rosedale west - Hob Crag quarry 1.	SE71379543	Abandoned.	1 st nest not completed.
9.	Rosedale west - Hob Crag quarry 2.	SE71389542	Predated.	2 nd nest, 1 st clutch.
10.	Rosedale west - Hob Crag quarry 3.	SE71449539	Fledged.	3 rd nest, 2 nd clutch.
11.	Rosedale west - Hob Crag quarry 4.	SE71379543	Fledged.	4 th nest, 3 rd clutch.
12.	Rosedale west - Hob Crag north	SE71189566	Predated.	Late 2 nd nest.
13.	Rosedale east - Reeking Gill 1.	NZ69240079	Fledged.	1 st nest.
14.	Rosedale east - Reeking Gill 2.	NZ69500083	Fledged.	2 nd nest.
15.	Rosedale east - Reeking Gill south 1.	NZ69290043	Fledged.	1 st nest.
16.	Rosedale east - Reeking Gill south 2.	NZ69330045	Fledged.	2 nd nest.
17.	Rosedale east - Reeking Gill cutting	NZ68870065	Abandoned.	1 st nest. Eggs laid.

Further details of Rosedale territories and nests can be found in sections: 4.5, 4.6 and 5.3. Also at Annex 3 and 4.

4.3 Annual Breeding Results

Table 3: Summary of annual breeding results at ring ouzel nest sites in Rosedale and other areas of the North York Moors. Data from 2000-2013. Detailed results are presented at **Annex 3**.

Year	Nests Monitored	Successful nests	Laying pairs (2 nd clutch)	Pairs that hatched young (2 nd attempt) [2 nd brood]	Pairs that successful fledged young (2 nd attempt/brood)	Pairs that failed to fledge young	Total young fledged	Mean fledged young per successful nest ^a .	Mean fledged young per laying pair ^b .
1	2	3	4	5	6	7	8	9	10
00	1	1	1	1	1	0	4	4.00	4.00
02	1	1	1 (1)	1 (1)	1 (1)	0	4	4.00	4.00
03	7	3	6 (1)	4 [1]	3	3	11	3.66	1.83
04	4	2	4 (1)	4 (1)	2 (1)	2	8	4.00	2.00
05	6	4	4 (2)	4 (1)[1]	4 (2) ^c	0	13	3.25	3.25
06	3	1	2	1 (1)	1 (1) ^d	1	5	5.00	2.50
07	4	3	4	3	3	1	12	4.00	3.00
08	9	6	7(3)	7[2] ^e	5(1)	2	23	3.83	3.29
09	5	5	4(1)	4[1]	4(1)	0	19	3.80	4.75
10	12	9	8 (5)	7 [3]	7(2)	1	30	3.33	3.75
11	19	15	14 (8)	13 [8]	12 (5)	2	55	3.67	3.92
12	13	7	11 (5)	6 (1)[3]	6 (2)	5	23	3.28	2.09
13	16	13	10 (6)	9 (1) [6]	9 (5) ^f	1	40	3.08	4.00
Overall Mean								3.76^g	3.26
<p>Note</p> <p>a. Mean fledged young per successful nest (Column 9) = Column 8 ÷ Column 3</p> <p>b. Mean fledged young per laying pair (Column 10) = Column 8 ÷ Column 4</p> <p>c. A pair had two unsuccessful attempts before being successful at the third attempt.</p> <p>d. A pair had one unsuccessful attempt before being successful at second attempt.</p> <p>e. A pair had two unsuccessful attempts; 1st was predated at the chick stage, 2nd at the egg stage.</p> <p>f. A pair had four nests; 1st was abandoned, 2nd was predated at egg stage, 3rd & 4th were successful.</p> <p>g. Mean for: Glen Esk (Burfield) 3.48; Moorfoots (Burfield) 3.50; Yorkshire Dales (Appleyard) 3.60; BTO Nest Records (Flegg & Glue) 3.60.</p>									

Interpreting Table 3

- Column 2 shows the total number of nests found and monitored that year.
- Column 3 shows the number of nests fledging young (i.e. successfully leaving the nest) that year.
- Column 9 shows the average number of young fledged from each nest that year (see Note g. for comparison with other study areas).
- Column 10 shows the number of young fledged per pair averaged for all the pairs that laid eggs that year and includes those pairs that abandoned their eggs, lost nests to predation or had infertile eggs. **This is a measure of productivity.**

The nests of 10 pairs were located and monitored in 2013, five of these (Hob Crag, Sheriff's Pit, Round Hill south, Reeking Gill and Reeking Gill south) had a second nest which were also monitored.

The second nest of a pair at Hob Crag north was monitored but their first nest was not found; though a day old fledgling that was considered as highly likely to have come from the first nest of this pair was seen just a short distance from where the second nest was located.

A pair at Hob Crag quarry built four nests. The first was abandoned and appeared to be a 'trial' nest. The second nest, built close to the first in an exposed position, was predated at the egg stage. The third nest was 83 metres from the second nest and successfully fledged young. And the fourth nest was built about 60 metres from the third nest, close to the first abandoned nest, and successfully fledged young.

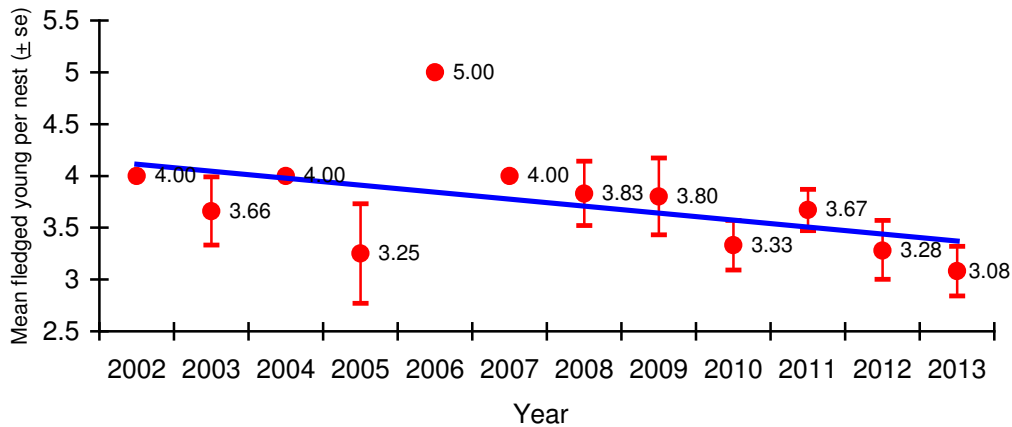


Figure 1: Annual mean fledged young per successful nest for Rosedale and other areas of the North York Moors between 2002-2013 showing 12-year trend.

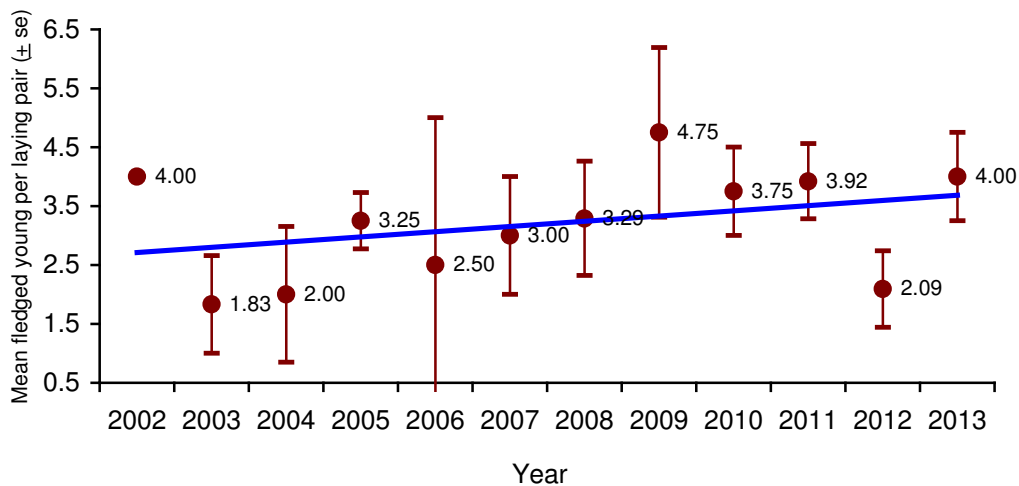


Figure 2: Annual mean fledged young per laying pair for Rosedale and other areas of the North York Moors between 2002-2013 showing 12-year trend.

Interpreting Figures 1 and 2

Figure 1 - Mean fledged young per successful nest

- Values are taken from Columns 3 and 9 in Table 3.
- The vertical axis shows the average number of young that fledged each nest in a particular year. The vertical **red** Hi-Lo line through each data point gives the standard error ($\pm se$) e.g. In 2012 an average of 3.28 young left the nest and that the standard error shows there is a 68% confidence that this value lies within the range 3.00 to 3.57.

Figure 2 - Mean fledged young per laying pair

- Values are taken from Columns 4 and 10 in Table 3.
- The vertical axis is the number of young fledged averaged over all the pairs that laid eggs. As in the above example, the vertical **brown** Hi-Lo line through each data point gives the standard error ($\pm se$).

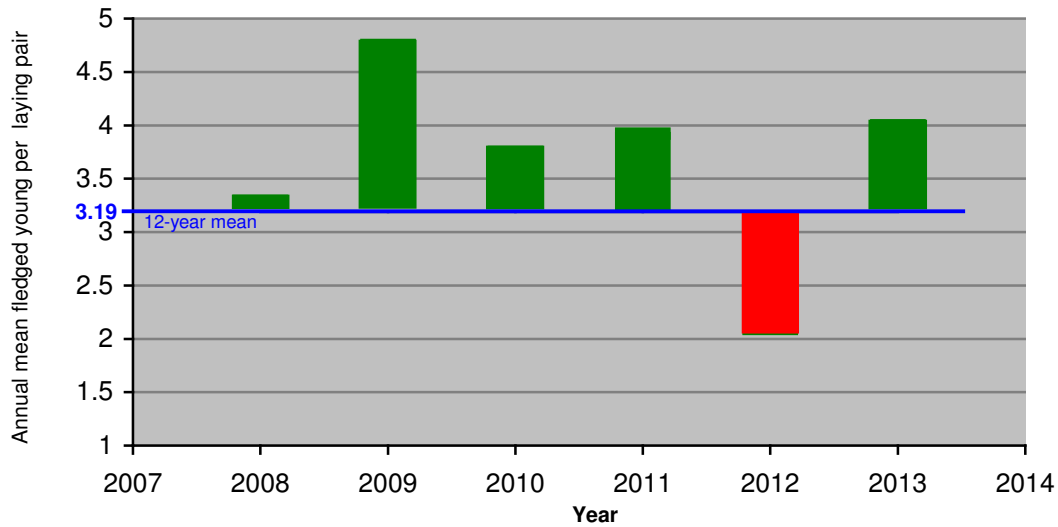


Figure 3: Annual mean fledged young per laying pair for Rosedale and other areas of the North York Moors between 2008-2013 relative to 11-year mean.

4.4 First-egg Laying Dates

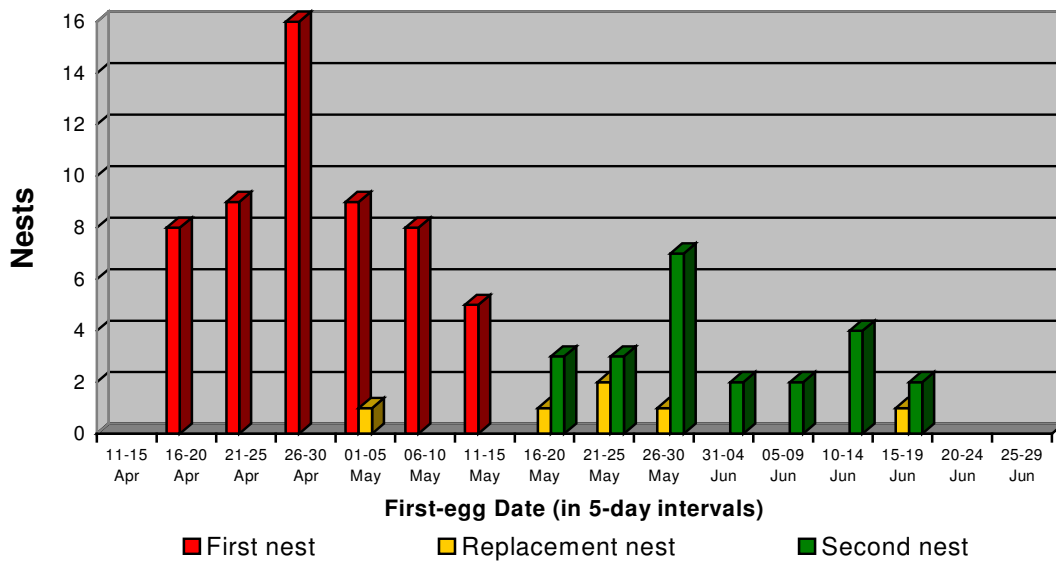


Figure 4: First-egg laying dates for Rosedale and other areas of the North York Moors between 2000 and 2013. Date points in 5-day intervals for the months of April, May & June. (n=84)

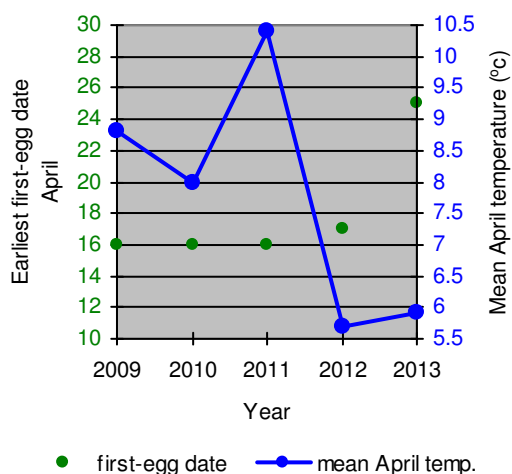


Figure 5: Earliest annual first-egg date and mean April temperature for the North York Moors for the five-year period from 2009 to 2013. (temperature data taken from Fig. 7)

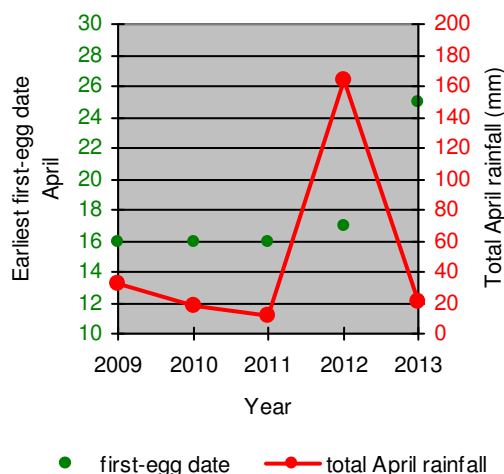


Figure 6: Earliest annual first-egg date and total April rainfall for the North York Moors for the five-year period from 2009 to 2013. (rainfall data taken from Fig. 7)

4.5 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	10 May	25 May	7 June	
	Sheriff's Pit south	21 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	26 April	11 May	24 May	
	Dalehead west	29 April	14 May	27 May	
2008	Sturdy Bank 1 st	29 April	14 May (a)	27 May (a)	
	Sturdy Bank 2 nd	10 June	25 June (a)	9 July (a)	1 st egg 14 days after 1 st nest fledged.
	Round Hill south	1 May	16 May (a)	29 May	
	Reeking Gill	5 May	20 May (a)	2 June	
	West Gill	25 April	10 May	23 May	Seen copulating on 22 April.
	Hob Crag 1 st	28 April	13 May (p)	-	
	Hob Crag 2 nd	27 May (p)	-	-	Replacement nest/eggs.
	Sheriff's Pit	7 May	22 May	4 June	
	Dalehead north	25 May	9 June (a) (p)	-	Likely replacement nest/eggs.
2009	Reeking Gill	16 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	26 April	11 May	24 May	1 st nest. 2 nd nest at Sheriff's Pit.
	Dalehead west	10 May	25 May	8 June	Likely to be 1 st nest.
	Sheriff's Pit	26 May	10 June	23 June (a)	2 nd nest. 1 st nest at Round Hill south.
2010	Sturdy Bank 1 st	30 April (a)	16 May (a)	29 May (a)	1 st nest.
	Sturdy Bank 2 nd	16 June (p)	-	-	Predated at egg stage.
	Reeking Gill	16 April	1 May	14 May (a)	1 st nest.
	Reeking Gill cut. 1 st	9 May	24 May (a)	6 June	1 st nest.
	Reeking Gill cut. 2 nd	11 June	26 June	7 July	2 nd nest. Likely fledged at 11 days.
	Ousegill 1 st	28 April	13 May (a)	26 May	1 st nest.
	Ousegill 2 nd	2 June	17 June (a)	-	2 nd nest. Failed at chick stage.
	Hob Crag 1 st	29 April	14 May	28 May (a)	1 st nest. Fledged at 14 days.
	Hob Crag 2 nd	9 June	24 June	7 July	2 nd nest
	Sheriff's Pit	13 May	28 May	10 June	Likely to be 1 st nest.
	Round Hill central	27 April	12 May	25 May	1 st nest.
	Dalehead quarry west	22 May	6 June	19 June	Likely to be 2 nd nest.

Year	Nest location	1 st Egg	Hatching	Fledging	Comments
2011	Hob Crag	19 April	4 May	17 May	1 st nest. In nest on 16th ready to fledge.
	Round Hill east	18 April	3 May	17 May	1 st nest. In nest on 16th ready to fledge.
	Round Hill west	10 May	25 May	7 June	1 st nest. In nest on 6th ready to fledge.
	Matty Carr	17 April	2 May (a)	16 May	1 st nest. In nest 14. Fledged & by nest 16.
	Sturdy Bank 1 st	21 April	6 May (a)	19 May (a)	1 st nest.
	Sturdy Bank 2 nd	28 May	12 June (a) (p)	-	2 nd nest. 3 hatched on 12th. Predated.
	Nab Scar north 1 st	21 April	6/7 May (a)	20 May (a)	1 st nest. 2 eggs hatched on 6th & 2 on 7 th
	Nab Scar north 2 nd	26 May	10 June	23 June (a)	2 nd nest. 3 pulli. 1 egg unhatched.
	Reeking Gill 1 st	16 April	1 May	14 May (a)	1 st nest.
	Reeking Gill 2 nd	19 May	3 June (a)	17 June (a)	2 nd nest. 3 eggs hatched on 3rd.
	Ousegill	28 April (a) (p)	-	-	1 st nest. Likely predated at egg stage.
	Dalehead west 1 st	23 April	8 May	21 May	1 st nest.
	Dalehead west 2 nd	29 May	13 June	26 June	2 nd nest. In nest 24/6, out of nest 27 th .
	Dalehead north	8 May	23 May	6 June (a)	1 st nest.
	Dalehead quarry wst 1 st	28 April	13 May	27 May (a)	1 st nest.
	Dalehead quarry wst 2 nd	?	(p)	-	2 nd nest. Predated at chick stage.
	Dalehead east	25 May (a)	9 June	22 June	Likely to be 2 nd nest.
	Thorgill Bank	18 May	2 June (a) (p)	-	Likely to be 2 nd nest. Predated.
	Sheriff's Pit	30 May	15 June	27 June	Likely to be 2 nd nest.
2012	Reeking Gill cutting	17 April	2 May (a)	16 May (a)	1 st nest. 3 eggs hatched 2/5. 14 days to fledged.
	Sturdy Bank	27 April (a)	-	-	1 st nest. Abandoned at egg stage.
	Nab Scar south	20 April (a)	5 May (a)	19 May (a)	1 st nest. 2 hatched 5 th . 14 days to fledged.
	Dalehead west	-	-	-	1 st nest. Abandoned at egg stage.
	Sheriff's Pit north	21 April	6 May	19 May (a)	1 st nest.
	Sheriff's Pit	28 May	12 June	25 June (a)	2 nd nest.
	Round Hill south	29 April	14 May (a)	(p)	1 st nest. Predated between Day 5 & 8.
	Reeking Gill	23 April	8 May (a)	22 May (a)	1 st nest. 14 days to fledging.
	Blakey Lion	10 May	25 May (a)	7/8 (a) June	1 st nest. 2 fledged 7/6 & 1 fledged 8/6.
	Matty Carr south	22 May	6 June	(p)	Likely 2nd nest. Predated between Day 2 & 6.
	Matty Carr quarry	19 June	4 July	(p)	Likely replacement 2 nd nest from MC south pair. Predated at chick stage between Day 5 & 9.
	Round Hill west	20 May	4 June (a)	17 June	Likely 2nd nest. One pulli died naturally in nest.
	Nab Scar north	?	-	-	2 nd nest. Predated at egg stage.
	Spaunton Knowl	22 April	8 May	(o)	1 st nest. 3 pulli. Outcome unknown.
2013	Reeking Gill cutting	-	-	-	1 st nest. 4 eggs laid. Found abandoned 19/5.
	Sheriff's Pit 1.	25 April	10 May	24 May	1 st nest. 2 fledglings seen close to nest on 27/5.
	Sheriff's Pit 2.	3 June	19 June	1 July	2 nd nest. 3 possibly Day 6 stage on 24/6. 1 near nest 8/7.
	Reeking Gill 1.	27 April	12 May (a)	25 May	1 st nest. 3 hatched 12 th & 1 on 13 th . Likely fledged 25 th .
	Reeking Gill 2.	28 May	12 June	24 June	2 nd nest. 2 pulli 21/6 9/10 days. Fledged 24/6 12/13 days. 1 egg unhatched.
	Reeking Gill south 1.	2 May	17 May	30 May	1 st nest. 2 pulli at Day 6 on 22/5. 2 eggs unhatched.
	Reeking Gill south 2.	5 June	20 June	3 July	2 nd nest. 4 pulli on 21/6 at Day 2 stage.
	Hob Crag quarry 2.	25/26 April	-	-	2 nd nest, 1 st clutch, predated at egg stage.
	Hob Crag quarry 3.	5 May	20 May (a)	2 June (a)	3 rd nest, 2 nd clutch. 3 hatched 20/5. 2 pulli in nest on 1/6.
	Hob Crag quarry 4	12 June	25 June	7 July	4 th nest, 3 rd clutch. Day 3 27/6. Likely fledged at 12 days.
	Dalehead west	28 April	13 May (a)	26 May	1 st nest. 1 hatched, 3 eggs on 13 th .
	Round Hill west	14 May	29 May	11 June (a)	Likely late 1 st nest. 4 pulli fledged 11/6.
	Round Hill south 1	2 May	17 May	31 May	1 st nest. Possibly 14 days to fledging.
	Round Hill south 2.	16 June	1 July (a)	13 July (a)	2 nd nest. Fledged at 12 days. One dead left in nest.
	Blakey Lion north	3 May	18 May	30 May	1 st Nest. Likely to have fledged at 12 days.
	Sturdy Bank	2 May	17 May	30 May	1 st nest. Day old fledgling found in nest area on 31/5.
	Blakey Lion south	12 May	27 June	9 June	Likely late 1 st nest. Day old fledgling found on 10/6.
	Hob Crag north 1.	15 May	30 May	12 June	Likely late 1 st nest. Day old fledgling found on 13/6.
	Hob Crag north 2.	19 June	4 July (a)	-	Late 2 nd nest. 3 eggs on 27/6. Day 1 on 4/7. Predated.
(a) = actual (o) = outcome unknown (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.					

4.6 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 of **64** metres with a median of **55** metres (n=26). For the North York Moors the mean and median values are **90** and **60** metres respectively (n=22).

Table 5: Distance between 1st and 2nd nests 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	
2011	Reeking Gill	NZ6915200719	NZ6916800713	17	
2011	Dalehead west	NZ6792700814	NZ6793700793	23	
2011	Sturdy Bank	NZ6986900050	SE6986899936	114	
2011	Dalehead quarry west	NZ6829600847	NZ6829600847	0	2 nd nest on top of 1 st nest.
2011	Nab Scar north	SE6945099957	NZ6943800004	48	
2012	Sheriff's Pit north/Sheriff's Pit	SE6967796429	SE6972596266	168	2 nd nest as used in 2011.
2013	Hob Crag quarry	SE7144095390	SE7137095430	83	1 st & 2 nd fledged nests.
2013	Hob Crag quarry	SE7138095420	SE7144095390	67	Predate & 1 st fledged nests.
2013	Sheriff's Pit	SE6972096260	SE6971996260	1	
2013	Reeking Gill	NZ6924000790	NZ6950000830	256	
2013	Reeking Gill south	NZ6929000430	NZ6933000450	39	
2013	Round Hill south	SE6968096710	SE6959096700	98	
Mean Distance				90.5	metres
Median Distance				60.0	metres

5. DISCUSSION

5.1 Climate

5.1.1 Local Observations

March: In sharp contrast to 2012, March was one of the wettest and coldest on record. The second half of the month saw a strong easterly airflow set in that brought snowfall to most parts of the dale causing widespread disruption. Overnight temperatures dropped well below freezing during the last few weeks of the month with the strong easterlies giving a raw edge to the temperatures that remained close to freezing.

April: The start of the month saw little change with day-time temperatures struggling to get beyond 3 to 5 degrees during the first two weeks. Continuing strong easterlies made the temperature feel near arctic at times, though by the start of the second week the snow that covered the ground down to 200 metres at the start of the month thawed leaving the ground hardened. By mid-April it was all change and more seasonal weather returned with winds coming from the southwest and temperatures in the high teens. On the 18th a blip saw storm force winds and gusts up to 60mph. By the end of the month conditions became more settled with daytime temperatures in the low teens and frost-free nights. In contrast to March the month was one of the driest on record with only the 27th producing any significant amount of rainfall.

May: The first half of the month saw little in the way of rain and the Spring Bank holiday weekend enjoyed temperatures of 20c. The continuing dry conditions and the exceptionally high temperatures resulted in the National Park Authority putting up Fire Warning signs on the moorland roads. The second half of the month saw an area of low pressure track northwards across the country resulting in over 20mm of rain falling overnight on the 17/18th. By the end of the month the more unsettled conditions had become firmly established with over 30mm of rain falling over-night on the 29/30th while daytime temperatures on several days remained below 10c, giving a distinctly cold edge to the gusty northerly air flow that was a feature of the closing days of the month and making Spring 2013 the coldest for more than 50 years.

June: The month started with more settled conditions as a high-pressure system established itself to the north of the UK. Daytime temperatures in the high teens made for a more summery feel with light winds a welcome change from the previous month's gusty northerlies. Rain fall remained low for most of the month with the exception being on the 23rd when more than 20mm fell during the afternoon. Other than the first few days in the month and a three-day period around the 19th, when temperatures touched 20c, the month experienced daytime temperatures in the low to mid teens giving a distinctly cool feel to the days.

July: The cool conditions continued into the month with daytime temperatures struggling to reach 15c. A westerly airflow gave a distinctly chilly edge to the first week with gusty conditions being a feature most days. By the start of the second week anti-cyclonic conditions became established with daytime temperatures well above 20c with 25c being recorded on several days and night-time temperatures staying above 15c. Rain-fall was minimal for most of the month with little in the way of precipitation, only on the 28th was there a significant fall when close on 20mm was recorded. The settled conditions continued for the rest of the month with July being placed by the Met Office in the top three sunniest and warmest.

Graphs of temperature and rainfall for the months April to July 2013 recorded at Westerdale, North York Moors, are shown at Annex 5. Figure 7 below charts the mean temperature and total rainfall for the month of April for the years 2009 to 2013 at Westerdale, while Figure 8 charts the regional mean temperatures and rainfall for the years 2001 to 2013.

The Westerdale weather station is located 180m a.s.l. near the village of Westerdale (NZ6605) on the North York Moors and is approximately five km north-west of Rosedale dalehead.

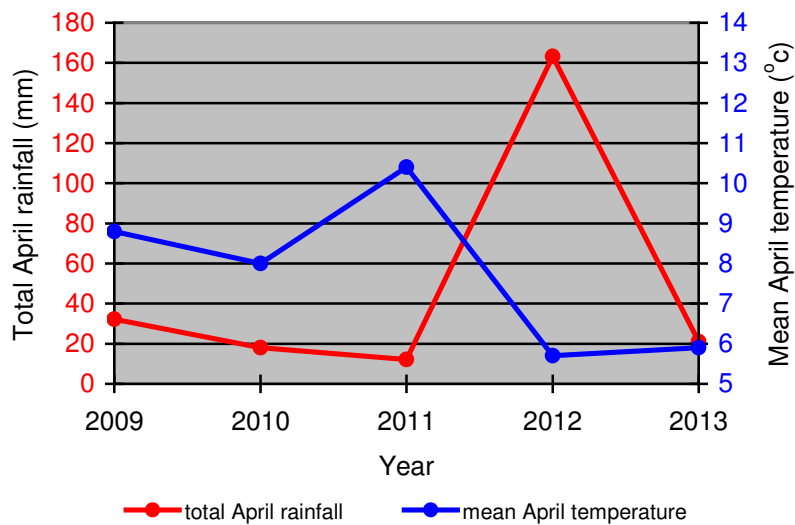


Figure 7: Mean temperature and total rainfall for the month of April recorded at Westerdale, North York Moors, between 2009 and 2013.

5.1.2 Regional Values

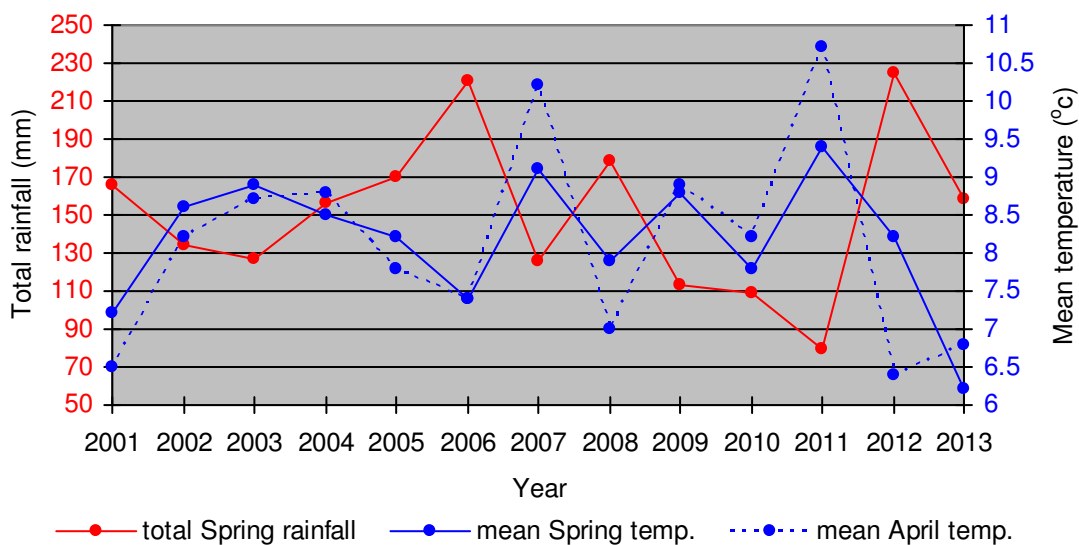


Figure 8: Spring and April mean temperatures and total rainfall between 2001 and 2013. (Data for Met Office North-East England region. Spring = March, April, May)

5.2 First Arrivals

Rosedale was monitored for first arrivals from March 14th, one week prior to the previous first arrival date. The first ring ouzel to be recorded in Rosedale in 2013 was a single male on the east side of the dale at Reeking Gill on 29th March; eight days later than 2012. The area at the time had around 80% snow cover with just a few isolated islands of clear ground visible. Four days later on 2nd April a male and female were seen in the Reeking Gill area and on the 6th a male was seen at East Mines. These first hardy arrivals were eventually joined by others and by 11th April milder weather arrived and the first sightings were recorded on the west side of the dale with one male seen at Matty Carr quarry and a male and two females at Round Hill south. Areas outside Rosedale were not monitored specifically for first arrivals.

On 7th April two males were seen on Kepwick Moor (SE4892) on the western edge of the North York Moors and were seen to “fly high in a SE direction”. The first arrival noted in Bransdale was

a single male on 15th April at Ousegill (SE6394). The extreme weather that gripped the northern half of Britain during the early part of April halted many migrants coming up from the south of the country. The BTO's Birdtrack website showed many ring ouzels had decided to halt their northerly migration and remain in the southern half of the country where conditions were somewhat milder.

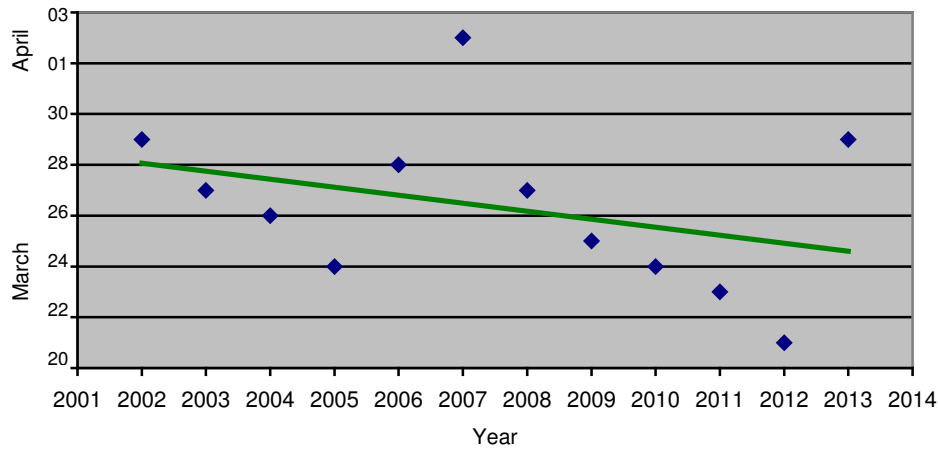


Figure 9: First-arrival date and 12 year trend for the Rosedale area of the North York Moors for the period 2002-2013.

5.3 Rosedale Territories and Nests

Twenty ring ouzel territories were recorded in 2013 in the Rosedale area of the North York Moors; second only to 2012 when 23 territories were recorded. The outcome came as a relief when the poor weather and low productivity of the 2012 season gave good reason to expect a drop in numbers returning for the 2013 breeding season. All except two territories had been occupied before and some, such as Dalehead west, Hob Crag, Reeking Gill, Round Hill south and Sheriff's Pit, almost annually since 1999. The two territories that were recorded for the first time in 2013 were Blakey Lion north and Reeking Gill quarry. A total of 36 territories have been recorded in the Rosedale area between 1999-2013 (Table 1). The location of the 2013 territories is shown at **Annex 1**.

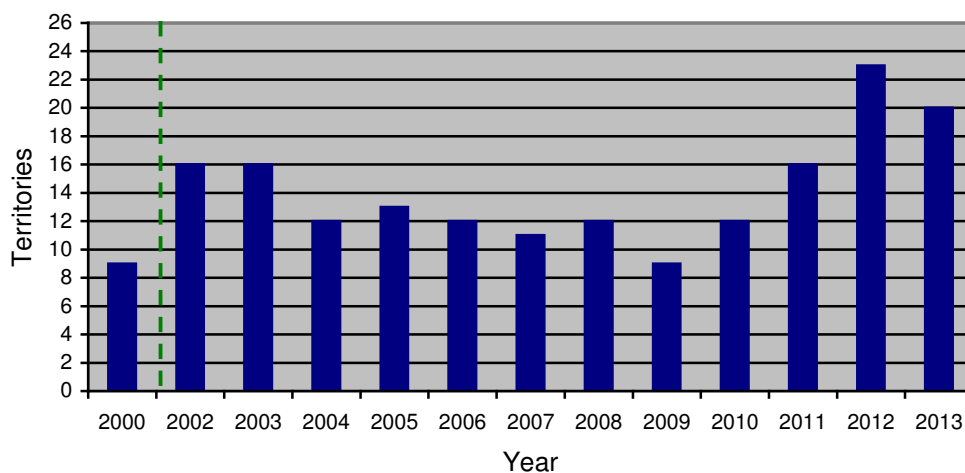


Figure 10: Territories recorded in the Rosedale area of the North York Moors Between 2000 and 2013. (foot & mouth prevented field work in 2001)

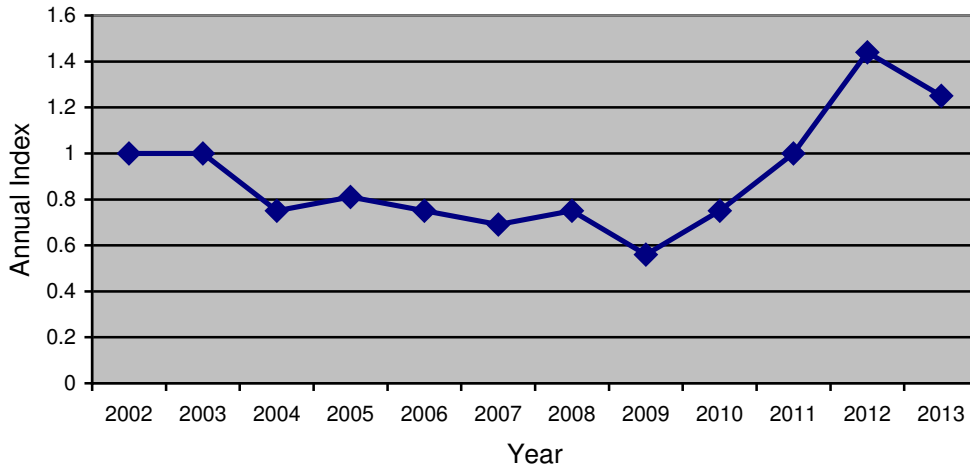


Figure 11: Annual indices of territories recorded in the Rosedale area of the North York Moors between 2002 and 2013 referenced to 2002.

5.3.1 Bank Top

A male and female were seen feeding at the top end of the incline on 22nd April. Disturbed by a passing vehicle they flew moorside back of the kilns and out of view. On 6th May a single male was seen in a tree at the bottom of the incline where a singing male had been recorded in 2012. It sang for five or so minutes before flying off towards the disused quarry above Hollins Farm.

Despite frequent visits to the area nothing further was recorded until 3rd June when a brief chacking was heard in the vicinity of the cottages. Having just about given up on this location a visit on 8th July located a male by the track at the back of the kilns collecting worms. After a few minutes he flew off with a beak full of worms over the kilns towards the incline but was then lost from view. Clearly a territory but one, as in previous years, that continues to prove elusive when it comes to pinning down the location of the nest site.

5.3.2 Blakey Lion north/south

Two pairs had been observed in the vicinity on several days during the last week in April and again during May without any leads to a possible nest site. Checks of the 2012 nest revealed no sign of refurbishment.

Finally on 27th May a nest containing four well-grown chicks was located close to the track below the Lion Inn. The nest was in a similar situation but about 300 metres away from the nest that produced four fledglings in 2012. Both adults were still carrying food to the nest on 28th May but two days later the nest was found empty. This was a day of swirling mists, occasional light rain and poor visibility so it was not possible to confirm whether adults were feeding fledglings in the vicinity but there were two distinct groups of droppings about four metres away from the nest indicating that fledglings may have hidden there for a while after leaving the nest.

On 10th June a pair of adults was watched carrying food to a location just dale-side of the track about 400 metres south of this nest. It appeared to be too young to be from the clutch presumed to have hatched 12 or 13 days earlier from the nest to the north. An adult and two well-grown juveniles were observed much lower down on Blakey Swang on 20th June.

This was the first time two pairs had nested successfully in the Blakey Lion area.

5.3.3 Dalehead quarry

A male was heard singing in the quarry on 2nd May and was present again on 6th May. On 3rd June a pair was observed feeding together close to the 2011 nest site but after a search no nest could be found. They were then seen taking food to at least two fledglings on the quarry floor. The male was then seen to chase another male intruder away northwards. Both adults were observed feeding a well-grown fledgling on 10th June and appeared agitated when disturbed close to the old nest site on 14th June.

5.3.4 Dalehead west

Ring Ouzels proved to be elusive at Dalehead until a pair was sighted on 29th April.

On checking last year's nest at Dalehead west on 8th May it was found to contain four eggs. A visit on 13th May revealed one very recently hatched chick and three eggs. Both adults were observed carrying food to the nest on 19th May and the female was seen to deliver a beak full of worms to three healthy chicks on 23rd May. The nest was empty on 27th May apart from one egg which had failed to hatch and the adults were observed taking food to scattered fledglings during the following week. This successful brood from a refurbished nest was particularly satisfying as four eggs had been abandoned in 2012.

5.3.5 East Mines

There had been repeated sightings of Ring Ouzels feeding at East Mines over the years but no nests had been found in that area; despite several detailed searches of likely nesting places.

In 2012 evidence emerged of a pair breeding in the neighbouring dale of Northdale and 'commuting' to East Mines to forage. More detailed observations in 2013 confirmed that this was the case when a pair were regularly seen foraging at East Mines and Sturdy Bank and flying to the neighbouring dale of Northdale with food (see map at Annex 1).

On one occasion a female feeding just below the track at East Mines flew across the track, up a gully, paused briefly on a wall about a third of the way up the daleside, then carried on to the skyline where she was seen to settle on a distinctive boundary stone before flying off out of sight. This behaviour was repeated twice more whilst observing from a higher vantage point near the wall. After moving higher still, a male with a beak full of food was seen to fly very high and straight over the skyline just south of the boundary stone. After moving to within 30 metres of the road between Northdale and Rosedale a male was seen flying across the road from Northdale heading towards the north end of East Mines. Ten minutes later the male flew back over towards Northdale followed 90 seconds later by the female. Around 90 seconds later the male flew back from Northdale towards East Mines having been there three minutes.

The road crossing area is the same place where a chance sighting was made from a car on 20th May 2012 when a male with a beak full of food was seen heading towards Northdale.

These observations confirmed that there were frequent forays between a nest in Northdale (probably at West Gill where a nest was found in 2008) and the foraging area at East Mines; a distance of 1.5km and the furthest recorded during the nesting season.

5.3.6 Hob Crag north

This site shows just how elusive some birds can be when it comes to tracking down territories. Despite passing by this site weekly it was not until 13th June that a female was seen with a beak full of worms close to the track some 300 metres north of Hob Crag quarry. Watching her from a distance for five or so minutes she eventually popped into a clump of heather by the track and re-appeared without the worms. On close inspection a newly fledged juvenile was found tucked tightly into the heather. Over the next few minutes the female was seen to go into one other place nearby with worms. The place where the juvenile was found was just a few metres from the 2011 nest site in an area that had been combed thoroughly on several occasions in April and May.

On 27th June a second nest containing three eggs was found alongside the track in a low heather bank just 20 metres from where the fledgling was seen earlier in the month. The nest was completely exposed and could clearly be seen from the track by passers-by. An inspection of the nest on 4th July found three newly hatched pulli; putting the first-egg date of the second nest at about five days after the fledging of the first nest on 13th June. On 8th July three pulli were seen at the Day 5 stage. The nest was inspected again on 11th July and found predated. While disappointing the outcome was expected as the nest was too exposed to escape the sharp eyes of avian predators such as crows or magpies that are regularly seen in the area.

5.3.7 Hob Crag quarry

If there was an award for the most persistent and determined ring ouzel in 2013 then the female at Hob Crag would be a serious contender. A pair was first located on 15th April feeding in the meadow below the quarry. The female was then seen working her way up to the quarry and later examining several niches in the quarry wall. While this was going on the male watched her

intently from a vantage point at the top of the quarry. On returning later in the day the female was back feeding in the meadow below the quarry.

Visiting the quarry on 22nd April both birds were seen close to where the female was seen prospecting for a nest a week earlier. After observing from a distance over the next hour the female was seen gathering nesting material from a damp part of the quarry floor and then taking this to a clump of heather half way up the quarry wall. This process lasted for some 45 minutes with the female bobbing back and forth at minute intervals and could clearly be seen weaving long stems of rushes. The male had left during this period of nest building but on his return the female stopped her work and flew off with the male out of the quarry.

On 29th April the area where the female was seen nest building was checked but no sign of a nest could be seen. While making a closer search of the spot where the nest was seen being constructed on the 22nd, the female flew out from a location a few metres away. A quick search of this new location revealed a nest containing four eggs. The nest was completely open to the sky with no protection from the elements or aerial predators. What happened to the first nest is not clear; was it her first attempt at nest building and was just practicing? did she re-use some of the material from the abandoned nest as there was no sign of this first nest? or did she not like the location or the finished article and scrapped it?.

A visit to the quarry on 6th May found the second nest had been predated at the egg stage - unsurprising given its vulnerable position. When entering the quarry later on in the day the female was flushed from a nest containing three eggs. This was less than a metre above the ground on a stone ledge overhung with heather and close to where three other nests had been found in previous years - the distance from the second nest was about 80 metres. Calculation of first-egg date suggest there was likely to be less than five days separating the first-egg of the third nest from the predation of the second nest. Inspection of the nest on 9th May found four eggs. On 20th May three newly hatched pulli were seen and one un-hatched egg. Again on the 27th three pulli at day eight stage with eyes open were seen, the female being disturbed on the ground close to the nest. Checking the nest on 1st June only two pulli could be seen at the Day 13 stage and close to fledging. By 3rd June the nest was found empty and both adults were seen close-by carrying food and dropping into the heather in two locations.

A visit to the quarry on 13th June flushed the female from a fourth nest that was within two metres of the first aborted nest. As the nest was too high up the quarry wall to see in, an inspection had to be left for another day and a mirror on a stick used to check its contents. Returning on 17th June four eggs could clearly be seen when viewed with the mirror. On 27th June four pulli were seen at the Day 3 stage and returning four days later the eyes were still closed. A visit on 4th July found four healthy looking pulli. On 8th July the nest was empty with evidence nearby of fledgling activity - droppings etc. Later in the day the female was observed about 100 metres from the nest chacking from the top of a clump of heather. She then was seen pursuing a stoat down the side of the dale giving the clear impression that she was protecting her young. This nest was calculated to have fledged at 12 days.

This was a most determined female having built four nests and successfully fledged two broods. Her nervous behaviour gave the impression that she was most likely a first year female.

5.3.8 Matty Carr quarry

The first sighting was a male on 11th April on top of a tree at the south end of the quarry. The bird flew off chacking as a kestrel passed by. No further sightings were recorded until 25th April when a male and female appeared from the north end of the quarry in response to the lure. Both landed at the south end of the quarry close to the observation point - the female on a clump of heather and the male on nearby rocks.

A visit to the quarry area on 16th May located a pair in the meadow below and slightly south of the quarry. On 23rd May a male disturbed feeding close to the track 100 metres north-west of the quarry was considered to be the quarry male. There were no further sightings until 20th June when a male flew into a tree at the north end of the quarry and chacked for a few minutes. Watching the male over the next 20 minutes or so he occasionally uttered a brief chack in a soft voice.

This was the last sighting in the quarry area. Though a nest was not found it was considered likely from the evidence that a pair nested in or near the quarry.

5.3.9 Nab Scar north/south

Pairs were present here on 12th, 20th and 26th April and a male was singing at the north end of the Scar on 30th April. There were further sightings on the 2nd and 15th May, and a male was heard singing on 22nd and 31st May and on 2nd June. Pairs were also flushed nearby from between Nab Scar north and the boundary stone on 22nd, 25th and 28th May. A female was seen stretching and preening herself on two of these occasions as if she had just come off a nest. This area is above the north end of Nab Scar north on the open moor and on the same level as the two nests found this year at Reeking Gill south. No nest could be found but on 6th July after a prolonged period of observation a male and two, possibly three, fledglings were seen in the vicinity of the cairn. One was a well-grown fledgling - quite sleek with a whitish bib.

5.3.10 Reeking Gill

On 6th May a suspected nest site above the waterfall was approached with both adult birds flying off with much chacking and dive-bombing - a behaviour that was noted with nests the previous two years in this gill. The nest perched on a branch of heather contained four eggs. On 13th May the nest contained three chicks but it was unclear whether the fourth egg was still present. On 21st May three nestlings were clearly visible - one with gaping beak. A photograph of the nest later identified four nestlings - proving the value of photographic evidence when nestlings sit tight together. On 23rd May a last check before fledging confirmed four nestlings again sitting tight and quiet amidst dive-bombing by both adults. The nest area was very quiet during a discreet watch on 25th May and when approached the nest was found to be empty with several droppings around the edge. The adults were heard chacking from near the waterfall and the level of agitation suggested that there were fledglings nearby. The male is believed to be the one that was the first to arrive back in the dale on 29th March - photographs showed he had the same faint line down his breast, just off centre. It had long been suspected that the first male to arrive, perhaps the strongest, selects the best site and starts breeding first. Reeking Gill is an ideal nesting site and has seen earliest first-egg dates for three of the last four years.

Attempts to find a second clutch close proved to be difficult. After lengthy observation the search was extended beyond the confines of the gill onto the open moor. On 21st June the female was seen with food and to settle near to a heather-clad shooting butt north-east of the gill. She eventually dropped down behind the butt and emerged without food. She later returned with more food and gave the appearance of being nervous. Eventually the male, who also had food, briefly joined the female before leaving her and dropping to the ground. When both adults left a partial cold search of the area was carried out and the nest located containing two chicks about eight days old. The nest was on the ground in a small heather shrub on a fairly flat area a metre or so from a little used track - a most unlikely spot in Rosedale especially for a pair that had just successfully reared a brood in a nest on a steep heather-clad slope in the gill.

On 24th June the nest was empty of nestlings but one un-hatched egg remained in the nest. Both adults were seen near the nest occasionally moving out of view. The female was quite wary and both adults seemed agitated. The fledglings were thought to be very close to the nest and technically may not have actually fledged (this has been noted before when nests at ground level allow the young to make short forays from the nest). On 26th June the male was seen sitting quietly on the shooting butt closest to the nest location when the female was located with a beak full of worms only about 10 metres from nest. She chacked as the nest was checked again with the same result. It seems likely that the chicks had fledged two days ago and as there were only two of them they would have been well fed and ready to fledge early.

5.3.11 Reeking Gill cutting

Following fleeting glimpses of a female leaving the cutting on 2nd and 10th May a prolonged and patient watch on 14th May finally led to the discovery of a nest with four eggs. It was built on a rock under a heather overhang, a short steep climb above the floor of the cutting. The female was still sitting on the four eggs on 15th May, a wet and windy day with low temperatures, but on 19th May the nest was found to be unattended and very wet with the eggs cold and with the odd bit of dead foliage in the nest. There was no sign of the female but a male could be heard singing loudly from high up on a boundary stone. On 25th May the nest only contained two eggs, a third

was broken and empty about 30cm from the nest and the fourth was missing. The two remaining eggs were later taken for examination and both found to contain partially developed chicks.

5.3.12 Reeking Gill south

This territory was first identified in 2012 although no nest was found that year. On 21st May a pair was eventually tracked down to the open moor above the steep slope of Reeking Gill south. Despite best efforts of observing the nest site in a large expanse of heather, the adults were far too nervous and did not reveal the exact location. A second attempt on 22nd May was successful and the suspected nest location was approached - from just two metres away the female could clearly be seen in the nest on the ground under a clump of heather. The nest contained two eggs and two nestlings about five days old with eyes open. On 25th May the female carrying food joined the male on some large rocks above the nest site. A quick inspection of the nest found two healthy nestlings about eight days old. Still present on 28th May they appeared to be about 11 days old and likely to fledge on 30th May. On 31st May the nest contained only the two eggs that had failed to hatch. One fledgling disturbed about 10 metres away from the nest flew about 10 metres further away and the adults then appeared from below the bank. The chicks were assumed to have fledged on 30th May as expected.

On 21st June the female was seen near the first nest and appeared less nervous this time. She dropped in to heather and stayed. After about five minutes the male appeared but left quickly. Approaching the area the female was found sitting on a nest on the ground approx 30 metres from the first nest but further eastwards up a gentle slope. Like the first nest she remained on the nest when approached, seemingly unperturbed by human presence. A later inspection of the nest when the female had flown off revealed four chicks that were estimated to be one day old. Inspecting the nest on 24th June three nestlings looked to be four days old with eyes still closed and the fourth a day younger. During a check on 26th June when the adults were away from the nest it was clear that one chick was not as well developed as the other three. On 1st July the four nestlings were well grown and appeared to be 11 days old (when compared to the reference Sturdy Bank photo sequence at day twelve).

On 3rd July the female was seen about 20 metres from nest with food in her beak looking very agitated. A short while later the male appeared with a beak full of worms. He dropped to the ground near some large rocks and re-appeared some moments later without food. The female was also seen moving through the heather with food and eventually emerging without. After 20 minutes whilst the adults were away, the nest was approached and found to be empty - somewhat flattened after four nestlings! On 4th July the female appeared from low down with much chacking. She was noted to be making a high-pitch contact call to her fledglings that were thought to be within 50 metres of the second nest.

5.3.13 Reeking Gill quarry

The behaviour of a pair in the Reeking Gill Quarry area in May and June indicated an occupied territory but a cold search of the area found no nest. On 28th May the male was heard singing and the pair generally seemed reluctant to leave the area. Occasionally a high-pitched contact call could be heard that is often used to warn chicks of danger. The pair was present again on 31st May and again the male was heard singing.

On 2nd June a male sang intermittently for two hours, first from somewhere on the bank, then on top of the quarry above the track, then later below the track in the pheasant feeding area and the nearby larch trees. On one occasion he came in chacking when walkers stopped below the quarry. Sometimes he came in above the quarry when other ring ouzels were flying across the top. Later the quarry male chacked at another pair feeding at the south end of the pheasant area whilst the female with a distinctive dark gorget was located hidden nearby amongst the rocks.

On 11th June a male was heard singing from the top of the quarry area. This male then clashed with a second male that was feeding fledglings from Reeking Gill south. The quarry male sang again from both quarry and pheasant feeding areas. Whilst checking the area the male chacked up to the quarry and sat high up on top before flying back down to the feeding area chacking. On approaching the quarry the male flew in and after swooping round he immediately flew out. All indications were that there was a nest in the quarry but a search of likely sites revealed nothing.

On 14th June a male was heard singing but could not be seen. After a few minutes he appeared at the south end of the quarry on a rock about half way up the bank. He sang for 10-15 minutes,

preening himself with the occasional odd chuck. A pair of buzzards came over and he immediately went quiet and didn't move. When they left the quarry he flew out and high over the gill, daleside.

Observations at this site were complicated by the proximity of the Reeking Gill and Reeking Gill south pairs, which both reared two broods, and the adjacent common feeding area. It was also of note that activity here only started after the Reeking Gill cutting nest was found abandoned. It is suspected that this male and possibly a dark gorgeted female, that was noted earlier in the season in the area, were those from the cutting.

5.3.14 Round Hill south

This area is one of the first places on the west side of the dale that returning ring ouzels are usually found. On 15th April three males and three females were seen in a tree below the track just south of Round Hill east. They were observed playing chasey-chasey around the tree top tuc-tucing as they did. After a short time they all flew off together northwards. A pair returned to the same tree an hour later.

On 18th April a pair were seen feeding in the meadow below the crags and again on 22nd and 29th April. By 6th May the female was seen flying from the meadow up a gully towards the track and again on the 9th and 23rd May she was seen entering the same gully. On 27th May a more thorough search was made of the dale bottom just above the meadow and the nest located with three pulli at Day10 stage. Observing from a distance on the 3rd June the female was seen foraging in the meadow but there was no sign of her feeding fledglings or going to the nest area in 20 minutes of observing.

On 13th June the male was seen singing by the track half way between Sheriff's Pit and Round Hill. On 1st July the female was seen flying from the meadow up a gully and landing at a spot in the heather half way up the dale side. A search of the area found a nest containing one newly hatched pullus, one just emerging from the egg and two un-hatched eggs (see front cover photo). This second nest was just under 100 metres from the first.

Inspecting the nest on 8th July found four healthy pulli at Day 8 stage. A photo was taken and all four opened their gape in response to the click of the camera shutter. A check on 13th July found one dead in the nest with the other three having fledged successfully (going by the moist droppings close to the nest) putting the hatch to fledge period at 12 days - the dead pullus appeared to have died in the nest at the Day 10/11 stage. Later the same day the female was observed some 20 metres below the nest in an area of dense bracken chacking and looking agitated. At the same time one juvenile was seen briefly moving through the bracken.

5.3.15 Round Hill west

Indications of a presence at this location were first noted on 18th April when chacking was heard from a location near the 2012 nest site. On 29th April a male was lured just a few metres from last year's nest at the north end of the cutting. There were no further sightings until 20th May when a female flew off a well-hidden nest containing four eggs just a few metres south of the 2012 nest site. The nest still contained four eggs on 23rd and 27th May and on the 30th May four pulli were seen estimated to be one day old (Day 2 stage). On 10th June the female was seen collecting worms in the dale bottom and flying to the nest - a quick check when the female left the nest found four pulli at Day 13 stage and close to fledging. The nest was inspected on the 11th June and all four were found to have fledged. Both adults were seen on 13th June in the dale bottom going into the heather in several places with food and again on the 20th June when the male was seen with worms - presumably still feeding the first brood young. Again on 24th June the male was seen in the dale bottom with a juvenile.

A male and female were seen on 27th June in the dale bottom below the first nest site. The male flew off towards Round Hill north carrying worms while the female continued to forage for a further 20 minutes before flying off in the same direction. Despite searching the area no second nest was found. The sighting was 16 days after the first nest fledged and was considered to be more than likely the pair feeding their second brood.

5.3.16 Sheriff's Pit

The disused pit shaft at Sheriff's Pit has been used most years since the study began - this year was no exception. Activity around the shaft was first noted on 11th April when a male landed on the netting that surrounds the shaft. It remained there for five or so minutes occasionally singing softly. On 18th April a pair was seen near the shaft with the female later flying to the grassy area 50 metres north of the pit shaft and close to the 2012 first nest site.

Approaching the pit on 22nd April a pair was flushed from the daleside of the track 50 metres south of the shaft - the female flying off northwards out of sight while the male landed on the pit fence where it remained for 20 minutes or so. Further activity was noted on the 29th April and on 2nd May when a female was seen dropping straight into the pit shaft and out of view. A brief inspection through the binoculars of past nest sites in the shaft found no obvious sign of a nest.

The breakthrough came on 16th May when both adult birds were seen going into the shaft with worms. Inspecting the shaft while both were away, the male returned with a beak full of worms and landed on the fence. Standing stock still for five or so minutes the male then dropped into the shaft and straight on to the nest. It was quickly apparent why the nest could not be seen on earlier visits as it was well tucked into dense vegetation about two metres down the sloping part of the shaft on the north-westerly side and was barely visible.

Because of the difficult nature of this site inspection has to be done from a distance of 10 metres or so through the wire safety fence. Looking through the binoculars on 20th May only one pullus could be seen with certainty. A further inspection on 23rd May again identified one pullus but with a distinct possibility of a further two based on their shape and form. Approaching the shaft on 27th May both adults were seen going into the heather with worms about two metres outside the fence on the north side of the shaft. Checking the area flushed two fledglings, both flying 25 metres or so into rushes on the moorside of the pit - the strength of their flight suggested they had likely fledged a few days earlier. During this time the male was observed occasionally singing a soft simple song before going to where the fledglings had flown (the soft singing of the simple song has been noted before with other ring ouzels and is thought to be the means by which the male teaches the fledglings the local dialect).

On 3rd June both male and female were seen around the pit with the female dropping into the pit shaft in the area of the first nest. A fledgling from the first nest was seen around 180 metres north of the pit while the male was observed taking a grub into a clump of heather suggesting a second juvenile was nearby. The second nest was located on 13th June when a search through the binoculars revealed the female sitting on a nest about a metre away from the first nest. On 24th June the male was seen on the pit fence post singing with a beak full of worms - repeated a further three times in 30 minutes. Looking into the shaft three pulli were seen that were estimated to be at the Day 6 stage. The female was not seen during this time. Further activity was noted on 27th June with the bulk of the feeding being done by the male. Again, as observed before, the male sang a short burst of simple song softly before dropping into the shaft with worms. Looking at the nest through binoculars one pullus could be seen with eyes wide open at the Day 9 stage and one other moving with the form of a possible third.

On 1st July the nest appeared empty and though the male was seen in the area there was no evidence of juveniles being fed. Returning on 8th July the male was seen on the moorside of the nearby stone ruin with a beak full of worms. After a few minutes he was observed going into some nearby rushes and almost immediately coming out with an empty beak. Checking the area quickly located a juvenile that flew some 50 metres towards the track. A short time later the male was seen closer to the pit shaft perched on a grit tray and singing softly before dropping to the ground out of view. The behaviour suggested a juvenile was likely to be close by.

5.3.17 Sledge Shoe

The first record at this site was on 2nd May when a male was seen singing in a tree just below the track at the south end of Sledge Shoe. On 9th May a bird was heard chacking in the dale bottom but was not seen. On 16th May a female was seen foraging in the dale bottom but after 10 minutes was lost from view amongst the heather. At the same time a male was seen singing from a prominent rock at the south end of Sledge Shoe.

No further sightings were recorded until 24th June when a female was seen chacking in the dalebottom. After a few minutes she flew into a heather bank in the dalebottom just 10 metres north of the public right of way. The area was checked but no nest was found.

5.3.18 Spindle Thorn

The first record for this site was of a male singing in the early evening near the old thorn tree on 25th April. On 6th May a lure was used on the west side of the road in the grassy area part way down the daleside. After five minutes or so a female appeared in the solitary tree in that area and softly chacked. After a couple of minutes she flew off and almost immediately was joined by a male. Both flew in a wide loop to the east side of the road and out of view.

There were no further sightings until 26th June when a female was seen on the west side of the road. An extensive search on both sides of the road on 27th June found no signs of a nest or of the female. A further sighting of a female was recorded on 29th June in the same location as on 26th on the west side of the road. There were no further sightings after this.

5.3.19 Sturdy Bank

A pair was observed visiting potential nest sites on 23rd April but no nest was located. The female was seen paying particular attention to a holly tree low down in gill on the west side - as if she wanted to fly to it. On 26th April the male was singing very gently in a reassuring way on the east side. A short time later the female suddenly flew out of the holly tree chacking. Again on 29th April there was unusual activity around the holly tree. All was quiet in the gill when suddenly the male appeared at speed from over the top of the head of the gill and settled high up on the west side chacking and singing loudly. Within two minutes the female came in on the same path and with same speed but came straight down to the holly tree, circled it and flew in to it. After a few chacks she fell silent. A later search of the holly tree found nothing but realistically it seemed too dense for nesting purposes. This very unusual activity occurred over three days and was of particular note given that the female of 2012 built a very open nest on the branch of an exposed heather shrub and abandoned it very early on - this female was subsequently found to be a very nervous bird, possibly a first year breeder. The 2013 pair was seen sporadically on 30th April, 6th and 22nd May. The male was present on 16th May and again singing on 22nd and 28th May. The first indication that the female could have a nest high up on the moor on the east side came on 25th and 28th May. She was seen feeding low down on the west side but then flew high up over the east side of the gill. A suspect area high up on the east side out of the gill was inspected on 31st May without success. However, later on the female was seen carrying worms and dropping in to the bilberry and then emerging without food. Eventually a fledgling was located motionless in the bilberry still showing down on the head. There was possibly only one fledgling as the locations visited by the female only changed slightly as if the fledgling had moved. The male took no part in feeding the young. The difficulty monitoring this site again this year could indicate it was the same nervous female of a year ago. In previous seasons the nests found here have been relative easy to find.

On 7th June a fledgling was flushed from the side of the beck at the bottom of the gill. It flew a short distance of about 20 metres and settled in rushes from where it later flew to the holly tree and settled underneath.

On 19th June the female was located just short of Sturdy Bank gill. Chacking she bobbed on to the fence and briefly in to the bracken. She was heard making the high pitched contact call. Later the female was seen again carrying food suggesting that the Sturdy Bank pair had a least one fledgling and possibly two.

5.3.20 Thorgill Bank

The first sighting was on 15th April when a male was seen perched on top of a burnt heather twig close to the 2011 nest site. No further sightings until 6th May when a male and female were seen around the cairn below the quarry - the male flying to a nearby tree and chacking where he preened before flying off towards the 2011 nest site. A search of the quarry and surrounding area including the 2011 nest site found nothing.

There were no further sightings until 20th May when a male was lifted from the gully on the Daleside of the track just south-east of the quarry. On 3rd June both adult birds were seen in the quarry area taking worms into one of the depressions close to the main quarry just a short distance from the nearby stone cairn. A cold search for the nest was made but without success. Again on 13th June both adults were seen around the cairn carrying worms and going into the heather close to the cairn. On taking a closer look at the area a fledgling was flushed within two

metres of the cairn and close to the area where the adults were seen on the 3rd. The juvenile flew off some 20 metres daleside.

On 24th June the male was seen singing briefly near the cairn. A search of the area around the cairn for a likely second nest located the first nest in one of the small depressions where the adult birds had been seen with worms on 3rd June - once found the nest was obvious but had defied earlier attempts at locating it. Later that day the male was seen feeding two juveniles and at one stage being pursued by one young demanding food.

The juveniles were seen again in the area on 27th June, 4th and 8th July. On 11th July the female was seen just 10 metres from the cairn while young were heard chacking further away in the dale bottom. No second nest was found at this site though the dates and observations suggest a second brood was reared successfully.

5.4 Breeding Productivity

A look at Table 2 on Page 7 shows that most nests (81%) in 2013 fledged young with just two (12%) being predated. Two nests were found abandoned - one containing four eggs and the other left unfinished. Abandoned nests are unusual in Rosedale, the first incidence of this being recorded in 2012 when a prolonged period of wet and cold weather resulted in two nests being abandoned at the egg stage.

A more detailed analysis of the 2013 results at Annex 3 on Page 30, show that for all nests (n=14) where eggs were laid 74% hatched and 87% of those that hatched fledged - therefore **65% of the eggs laid in 2013 produced chicks that successfully left the nest.**

If the figures for 2013 at Annex 3 are broken down into 1st and 2nd nests then the results show that 61% of 1st nest (n=9) and 72% of 2nd nest (n=5) eggs fledged young successfully - the 2nd and 3rd nest at Hob Crag quarry were treated as first nests and Sheriff's Pit was not included as there was no available egg data.

The above figures show slightly better productivity in 2013 for Rosedale second nests compared to first nests, and is contrary to the Burfield study that found "significantly fewer chicks hatched and fledged from second brood nests compared to first brood nests" in the Moorfoots and Glen Esk study areas between 1998-2000. However, it should be noted that the Rosedale figures are for just one breeding season and that the sample size is much smaller than the Burfield study.

5.5 Passage Migrants

On 15th April two ring ouzels were seen at RAF Fylingdales on Lockton High Moor (SE8696) - a traditional stop-over place for Fennoscandian passage birds. On 22nd April a flock of 12 Fennoscandian ring ouzels were seen foraging in a meadow above Bank Farm (SE7294) at the bottom of Chimney Bank, Rosedale - at least two females were noted in the flock.

Along the Yorkshire coast Spring migrants were recorded on 12th, 13th and 25th April, while return migrants were seen throughout October on the 12th, 13th, 14th, 15th, 20th and 21st - all sightings being single birds.

Elsewhere of note was the report of a large "fall" of Fennoscandian migrants on 12th October along the Kent and Sussex coast with 150 or so seen in flight "noisily chacking".

5.6 Late Summer Activity

As in previous years a late season visit was made to Rosedale specifically to locate ring ouzels prior to migration. After the poor crop of rowan berries in 2012, with many trees failing to fruit, 2013 turned out to be an excellent year with most rowan trees heavily laden with fruit at the critical period just prior to migration. Despite the bumper crop of berries the numbers seen feeding in the rowan trees was disappointingly low.

On 12th September two males, one female and a juvenile were seen just north of Blakey Swang (SE6899) on the intake wall. Two were seen later in a nearby rowan tree feeding on berries. On 24th September eight were reported at Blakey crossing (SE6898) and on 27th September 12 were reported flying south-east over Easterside, Hawaby (SE5589). On 5th October one male and two females were seen flying into a rowan tree at Reeking Gill (NZ6900).

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ANNEX 1 - Map of Nest Sites and Territories in the Rosedale Area in 2013

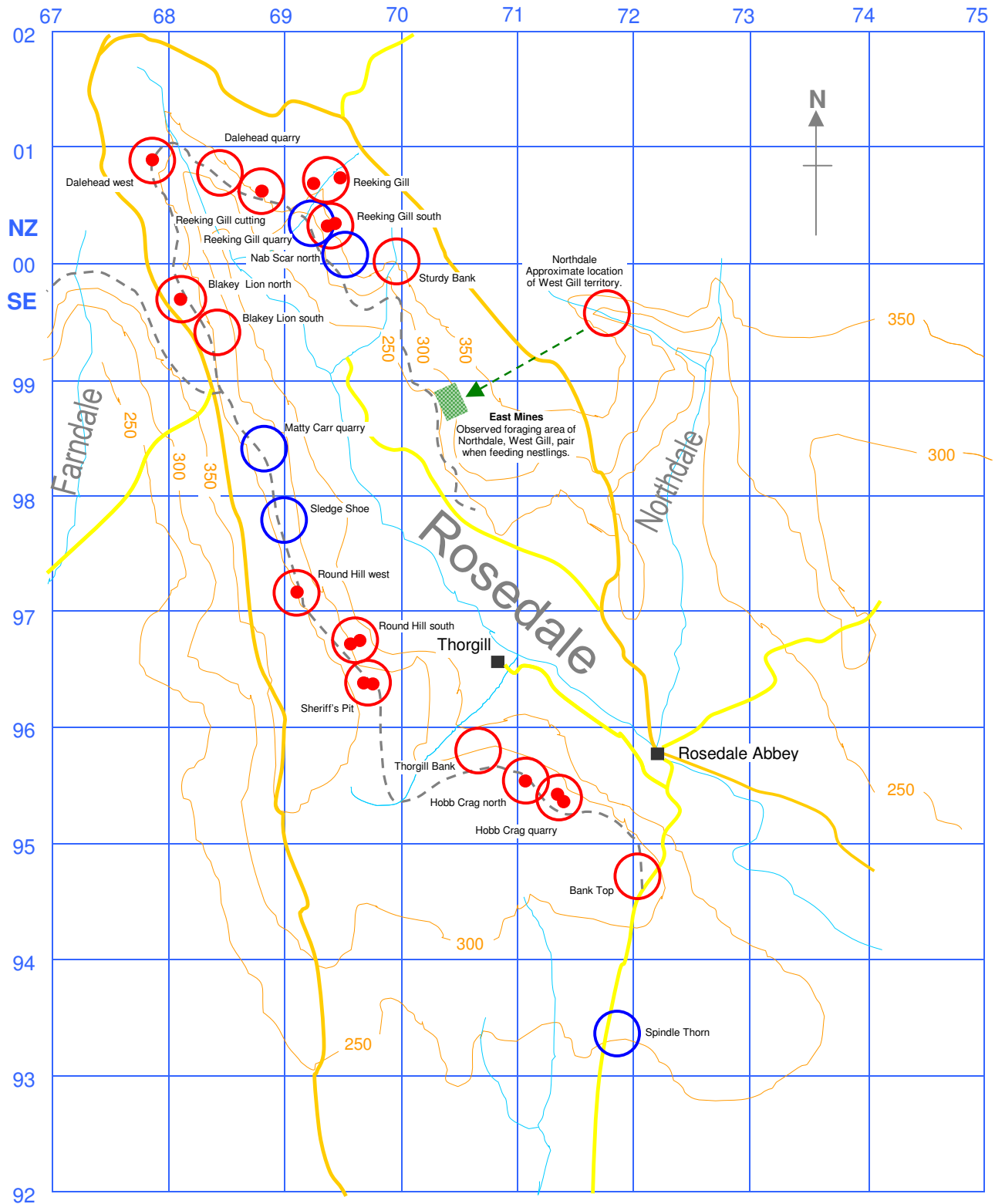


Diagram 1: Ring ouzel nest sites and territories where Confirmed or Probable breeding was recorded in the Rosedale area of the North York Moors in 2013.

- Nest Site.
- Territory where Confirmed breeding was recorded.
- Territory where Probable breeding was recorded.

**ANNEX 2 - Map of Sightings on the North York Moors in 2013
(Other than the Rosedale area & passage migrants)**

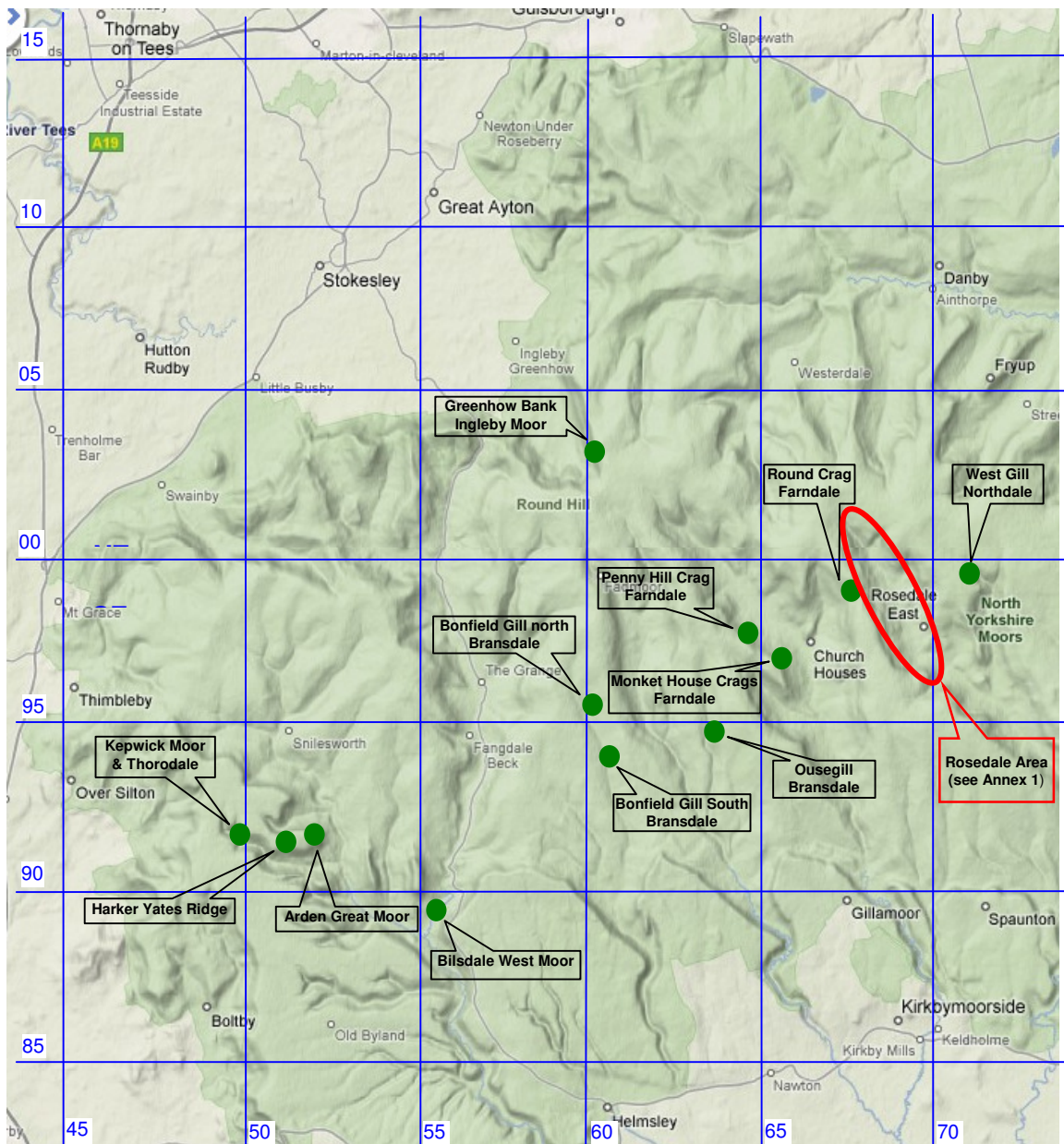


Diagram 2: Sightings of ring ouzels on the North York Moors in 2013 other than the Rosedale area and passage migrants.

ANNEX 3 - Table of Annual Breeding Results from 2000 to 2013

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 2013.

Year	Site	Grid Ref.	Eggs	Hatched	Fledged	Comments
2000	Spaunton Moor - Pen Wash	SE71479347	4	4	4	1 st brood. 4 pulli ringed.
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	Spaunton Moor - Pen Wash	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	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 st	SE69659631	+	1	0	1 st nest. Nest abandoned; reason unknown.
2005	Sheriff's Pit 2 nd	SE69659631	+	0	0	2 nd attempt. Predated at egg stage.
2005	Sheriff's Pit 3 rd	SE69659631	+	3	2	3 rd nest.
2005	Matty Carr quarry	SE68809835	4	4	4	Thought to be 1 st brood.
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 st	SE69659631	4	0	0	Nest on NW side of pit shaft washed out by heavy rain in mid May.
2006	Sheriff's Pit 2 nd	SE69779609	5	5	5	2 nd attempt 185m south of pit shaft.
2006	Dale Hd West	NZ67930081	4	+	+	Likely to be 2 nd brood. Not known if hatched or fledged.
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 st	SE69899991	4	4	4	1 st nest.
2008	Sturdy Bank 2 nd	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, West Gill	SE71799957	+	+	3	1 st nest.
2008	Hobb Crag 1 st	SE71449539	4	4	0	1 st attempt. Predated at pulli stage. Used 2003/4 nest site.
2008	Hobb Crag 2 nd	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.	NZ67950102	4	1	0	Likely to be 2 nd attempt. Failed after 1 st hatching. 1 egg left in nest.
2009	Dale Hd West	NZ67940079	4	4	4	1 st nest.
2009	Sturdy Bank	SE6987 9991	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	Ouzegill 2	SE63989497	5	3	0	2 nd nest 140m sth of 1st nest. Predated at pulli stage. 2 eggs left.
2010	Ouzegill Bridge	SE63929444	5	0	0	Likely to be 2 nd nest. Predated at egg stage.
2010	Sturdy Bank 1 st	NZ69890000	3	3	3	1 st nest.
2010	Sturdy Bank 2 nd	NZ69870005	3	0	0	Predated at egg stage.
2010	Reeking Gill	NZ69080068	+	4	4	1 st nest.
2010	Reeking Gill cut 1 st	NZ68790066	4	4	4	1 st nest.
2010	Reeking Gill cut 2 nd	NZ68860068	+	3	3	2 nd nest 69m east of first nest.
2010	Hob Crag 1 st	SE71389544	+	4	4	1 st nest.
2010	Hob Crag 2 nd	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.
2011	Hob Crag	SE71239557	+	4	4	1 st nest.
2011	Round Hill east	SE69459685	+	4	4	1 st nest.
2011	Round Hill west	SE69269706	4	4	4	1 st nest.
2011	Matty Carr quarry	SE68809836	4	4	4	1 st nest.
2011	Ouzegill Bridge	SE63969475	4	0	0	1 st nest. Likely to have been predated at egg stage.
2011	Sturdy Bank 1 st	NZ69870005	3	3	3	1 st nest.
2011	Sturdy Bank 2 nd	SE69879994	4	3	0	2 nd nest. Nest predated. 1 egg unsure if hatched.
2011	Nab Scar north 1 st	SE69459996	4	4	4	1 st nest.
2011	Nab Scar north 2 nd	NZ69440000	4	3	3	2 nd nest. One egg left in nest.
2011	Reeking Gill 1 st	NZ69150072	4	+	+	1 st nest. Fledged; assumed all 4 left nest.
2011	Reeking Gill 2 nd	NZ69170071	5	5	5	2 nd nest.
2011	Dalehead west 1 st	NZ67930081	4	3	3	1 st nest. One egg left in nest.
2011	Dalehead west 2 nd	NZ67940079	4	3	3	2 nd nest. One egg left in nest.
2011	Dalehead quarry west 1 st	NZ68290085	4	4	4	1 st nest.
2011	Dalehead quarry west 2 nd	NZ68290085	4	+	0	2 nd nest. Nest predated at chick stage.
2011	Dalehead east	NZ68650075	4	4	4	Likely to be 2 nd nest.
2011	Dalehead north	NZ68050125	+	4	4	1 st nest.
2011	Thorgill Bank	SE70669580	4	4	0	2 nd nest. Likely to have been predated at chick stage.
2011	Sheriff's Pit	SE69739627	+	2	2	Likely to be 2 nd nest.

? = Outcome unknown + = Exact value unknown.

Year	Site	Grid Ref.	Eggs	Hatched	Fledged	Comments
2012	Reeking Gill cutting	NZ68810067	4	4	4	1 st nest.
2012	Nab Scar south	SE69499988	4	3	3	1 st nest. 4 eggs laid, 1 removed.
2012	Sturdy Bank	SE69859966	4	-	-	1 st nest. Nest abandoned at egg stage.
2012	Dalehead west	NZ67940080	4	-	-	1 st nest. Nest abandoned at egg stage.
2012	Sheriff's Pit north	SE69689643	4	4	4	1 st nest.
2012	Sheriff's Pit	SE69739627	+	+	2	2 nd nest.
2012	Round Hill south	SE69449670	4	4	0	1 st nest. Nest predated at chick stage.
2012	Reeking Gill	NZ69190066	4	4	4	1 st nest.
2012	Blakey Lion	SE68239960	5	3	3	1 st nest. 2 fledged 7/6 & 1 fledged 8/6.
2012	Matty Carr south	SE68889818	3	3	0	2 nd nest. Nest predated at chick stage.
2012	Matty Carr quarry	SE68809835	+	3	0	Likely replacement 2 nd nest from Matty Carr south pair.
2012	Round Hill west	SE69269706	4	4	3	Likely to be 2 nd nest. One pulli died naturally in nest.
2012	Nab Scar north	NZ69430006	4	0	0	2 nd nest. Nest predated at egg stage.
2012	Spaunton Knowl	SE71709180	+	3	?	1 st nest. 3 naked pulli on 24/5. Outcome unknown.
2013	Reeking Gill cutting	NZ68870065	4	0	0	1 st nest. 4 eggs 14/5. Found abandoned 19/5.
2013	Dalehead west	NZ67940079	4	3	3	1 st nest. 1 hatched 13/5. 3 pulli 23/5. 1 egg left in nest.
2013	Reeking Gill 1.	NZ69240079	4	4	4	1 st nest. 3 pulli 13/5. 4 pulli 21/5. Fledged.
2013	Reeking Gill 2.	NZ69500083	(3)	2	2	2 nd nest. 2 pulli on 21/6 at Day 9/10 stage. Fledged 24/6 1 egg left.
2013	Reeking Gill south 1.	NZ69290043	4	2	2	1 st nest. 2 pulli at Day 6 on 22/5. 2 eggs unhatched.
2013	Reeking Gill south 2.	NZ69330045	(4)	4	4	2 nd nest. 4 pulli on 21/6 at Day 2 stage. Fledged
2013	Hob Crag quarry 2nd	SE71389542	4	0	0	2 nd nest first clutch. Predated at egg stage.
2013	Hob Crag quarry 3rd	SE71449539	4	3	2	3 rd nest second clutch. 3 hatched 20/5. 2 pulli in nest on 1/6.
2013	Hob Crag quarry 4th	SE71379543	4	4	4	4 th nest third clutch.
2013	Hob Crag north	SE71189566	3	3	0	Late 2 nd nest. 3 eggs on 27/6. Hatched 4/7. Predated.
2013	Sheriff's Pit 1.	SE69729626	+	2	2	1 st nest. Look to be 2 pulli. 2 fledglings seen near nest on 27/5.
2013	Sheriff's Pit 2.	SE69729626	+	3	3	2 nd nest. Look to be 3 pulli at possibly at Day 8 stage on 24/6.
2013	Round Hill west	SE69259705	4	4	4	1 st nest (late). 4 pulli seen in nest 10/6. Fledged 11/6.
2013	Round Hill south 1.	SE69689671	4	3	3	1 st nest. Still in nest on 30/5. Likely fledged 31/5. 1 egg broken.
2013	Round Hill south 2.	SE69599670	4	4	3	2 nd nest. 1 just hatched, 1 hatching, on 1/7. 1 dead left in nest.
2013	Blakey Lion north	SE68049997	(4)	4	4	1 st nest. Likely to have fledged after 12 days.

? = Outcome unknown + = Exact value unknown (4) = Most likely value

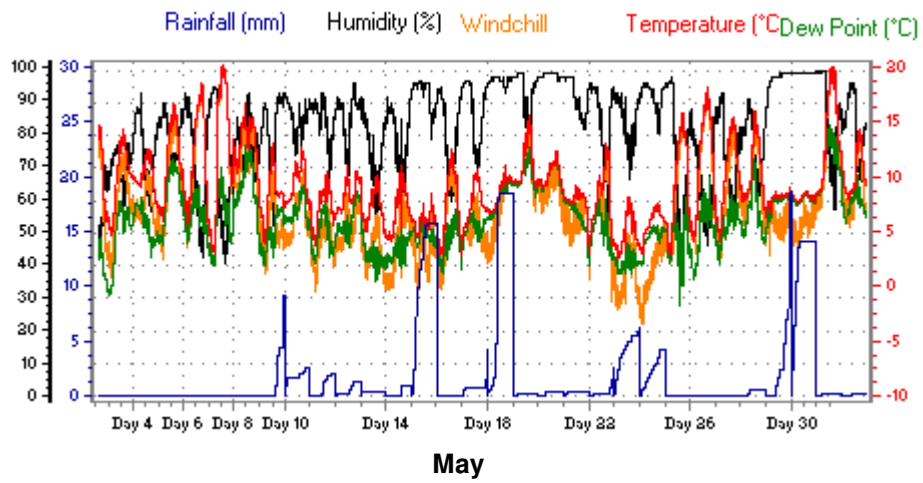
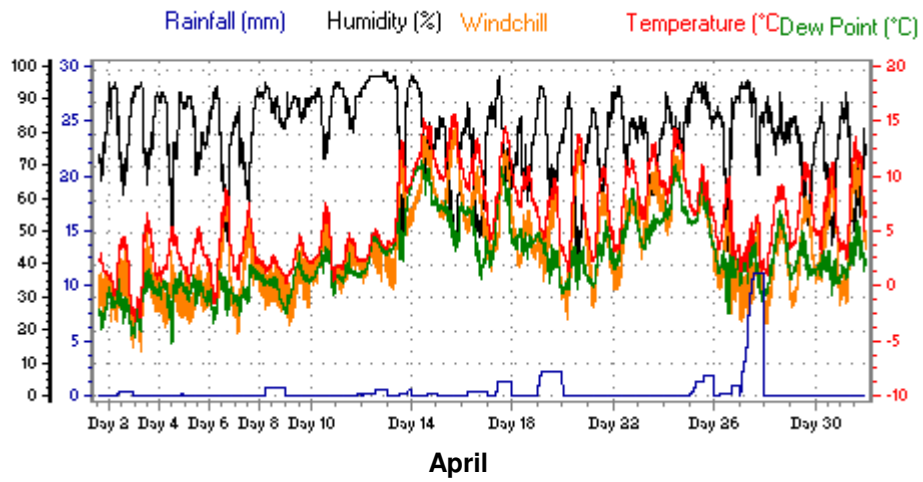
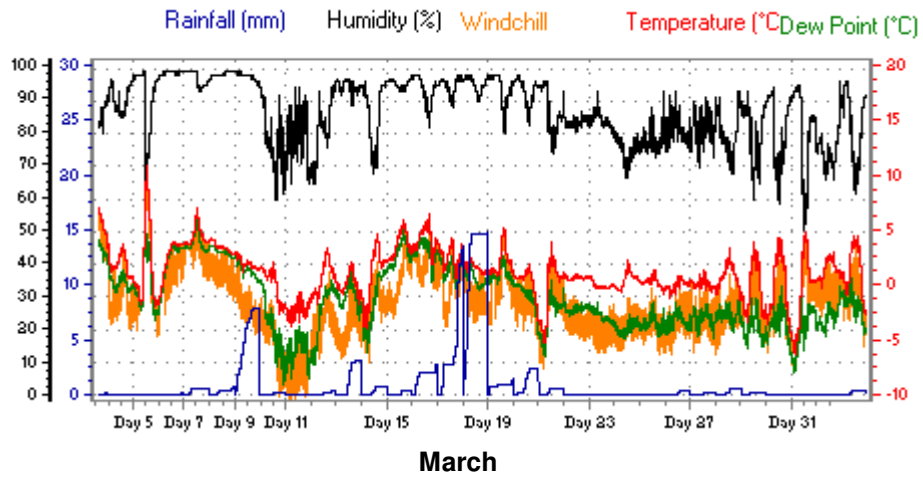
ANNEX 4 - Table of Nest Aspect and Elevation from 1999 to 2013

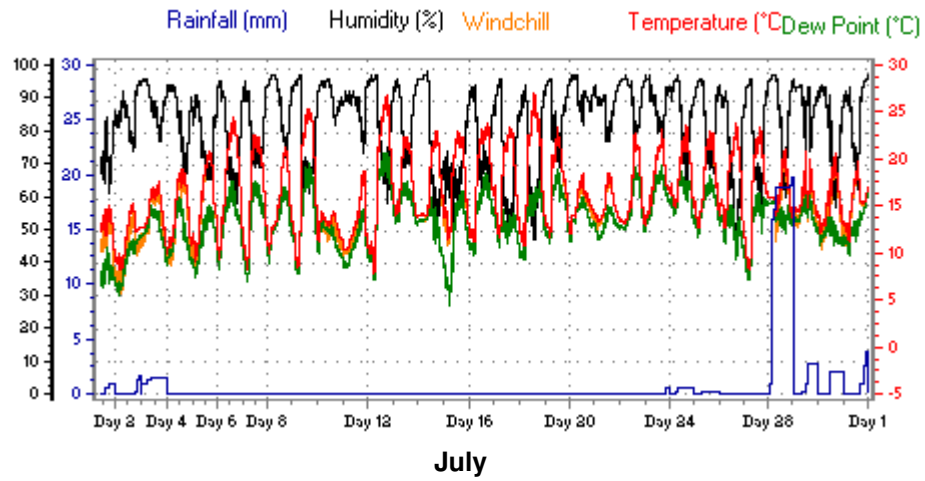
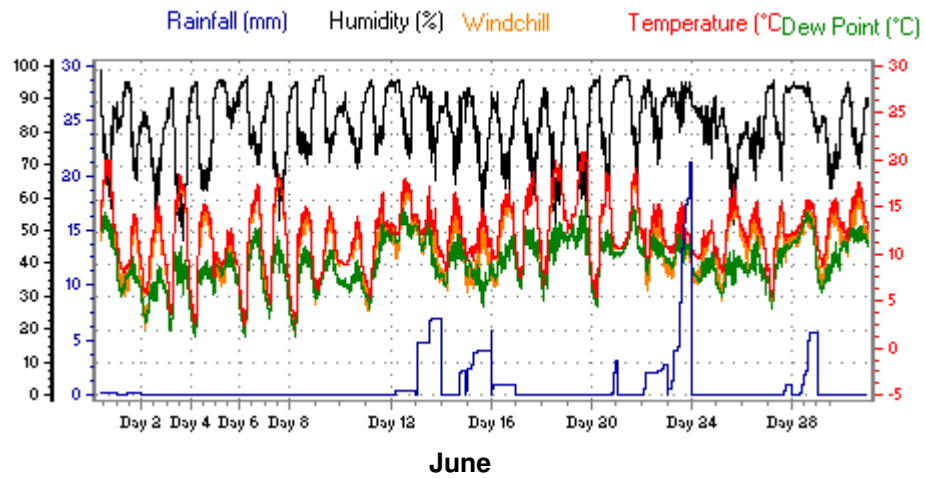
Table 1: Aspect & elevation of nest sites mainly in the Rosedale area of the North York Moors.

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 st	SE 7144 9539	NNE	310m
2008	Rosedale - Hob Crag 2 nd	SE 7139 9545	NE	313m
2008	Northdale - 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 st	SE 6989 9991	W	307m
2008	Rosedale - Sturdy Bank 2 nd	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 st & 2 nd)	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 st	NZ 6879 0066	S	328m
2010	Rosedale - Reeking Gill cutting 2 nd	NZ 6886 0068	SE	329m
2010	Rosedale - Dalehead (quarry west)	NZ 6828 0082	S	281m
2010	Bransdale - Ousegill 1 st	SE 6400 9511	W	250m
2010	Bransdale - Ousegill 2 nd	SE 6398 9497	E	250m
2010	Bransdale - Ousegill Bridge	SE 6392 9444	W	225m
2011	Rosedale - Hob Crag (north)	SE 7123 9557	NW	313m
2011	Rosedale - Thorgill Bank	SE 7066 9580	NW	307m
2011	Rosedale - Sheriff's Pit	SE 6972 9627	SE	343m
2011	Rosedale - Round Hill (east)	SE 6945 9685	E	321m
2011	Rosedale - Round Hill (west)	SE 6926 9706	NE	352m
2011	Rosedale - Matty Carr quarry	SE 6880 9836	NW	343m
2011	Rosedale - Dalehead (north)	NZ 6805 0125	SW	341m
2011	Rosedale - Dalehead (west) 1 st	NZ 6793 0081	SW	352m
2011	Rosedale - Dalehead (west) 2 nd	NZ 6794 0080	SW	347m
2011	Rosedale - Dalehead (east)	NZ 6865 0076	NE	328m
2011	Rosedale - Dalehead quarry (west) 1 st & 2 nd	NZ 6830 0085	E	296m
2011	Rosedale - Reeking Gill 1 st	NZ 6915 0072	S	333m
2011	Rosedale - Reeking Gill 2 nd	NZ 6917 0071	S	319m
2011	Rosedale - Nab Scar north 1 st	SE 6945 9996	SW	337m
2011	Rosedale - Nab Scar north 2 nd	NZ 6944 0000	SW	339m
2011	Rosedale - Sturdy Bank 1 st	NZ 6987 0005	E	343m
2011	Rosedale - Sturdy Bank 2 nd	SE 6987 9994	W	288m
2011	Bransdale - Ousegill	SE 6396 9475	E	240m

Year	Location	Grid Reference	Aspect	Elevation
2012	Rosedale - Sheriff's Pit (north)	SE 6968 9643	N	343m
2012	Rosedale - Round Hill (south)	SE 6944 9670	NW	350m
2012	Rosedale - Dalehead (west)	NZ 6794 0080	SW	347m
2012	Rosedale - Reeking Gill cutting	NZ 6881 0067	S	328m
2012	Rosedale - Reeking Gill	NZ 6919 0066	N	334m
2012	Rosedale - Nab Scar (south)	SE 6949 9988	SSW	330m
2012	Rosedale - Sturdy Bank	SE 6985 9996	SSE	300m
2012	Rosedale - Blakey Lion	SE 6823 9960	E	366m
2012	Rosedale - Matty Carr (south)	SE 6888 9819	SSE	357m
2012	Rosedale - Round Hill (west)	SE 6926 9706	NE	352m
2012	Rosedale - Nab Scar (north)	NZ 6943 0006	SSW	345m
2012	Rosedale - Sheriff's Pit	SE 6972 9627	SE	343m
2012	Rosedale - Matty Carr quarry	SE 6880 9835	SE	331m
2013	Rosedale - Hob Crag quarry 1 st (abandoned)	SE 7137 9543	-	-
2013	Rosedale - Hob Crag quarry 2 nd (predated)	SE 7138 9542	NW	305m
2013	Rosedale - Hob Crag quarry 3 rd 1 st fledged	SE 7144 9539	N	295m
2013	Rosedale - Hob Crag quarry 4 th 2 nd fledged	SE 7137 9543	NE	304m
2013	Rosedale - Hob Crag north	SE 7118 9566	E	314m
2013	Rosedale - Thorgill Bank	SE 7075 9584	ENE	294m
2013	Rosedale - Sheriff's Pit 1 st & 2 nd	SE 6972 9626	SE	343m
2013	Rosedale - Round Hill south 1 st	SE 6968 9671	NNE	279m
2013	Rosedale - Round Hill south 2 nd	SE 6959 9670	ENE	307m
2013	Rosedale - Round Hill west	SE 6925 9705	ENE	344m
2013	Rosedale - Blakey Lion north	SE 6804 9997	E	365m
2013	Rosedale - Dalehead west	NZ 6794 0079	E	354m
2013	Rosedale - Reeking Gill cutting	NZ 6887 0065	N	335m
2013	Rosedale - Reeking Gill 1 st	NZ 6924 0079	SE	370m
2013	Rosedale - Reeking Gill 2 nd	NZ 6950 0083	SSE	392m
2013	Rosedale - Reeking Gill south 1 st	NZ 6929 0043	WSW	358m
2013	Rosedale - Reeking Gill south 2 nd	NZ 6933 0045	WSW	367m

ANNEX 5 - Graphs of Daily Max/Min Temperature & Rainfall for the Months March to July





Daily max/min temperature & rainfall recorded at Westerdale, NZ665058, altitude 180m, in 2013.