RING OUZEL REPORT 2014

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

Summary of 2014 Report on Page 3

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Front-page photo: Male ring ouzel incubating eggs in exposed nest, Reeking Gill, Rosedale, 12th June 2014. Vic Fairbrother

1. SUMMARY OF 2014 RING OUZEL REPORT

1. **First-arrival at East Mines on 21st March - equals earliest recorded** (5.2, Pg. 14)

2. **Second highest record of breeding pairs with 21 territories recorded** (5.3, Pg. 15)

3. **Favourable weather saw early start to breeding season** (5.1.1, Pg. 13)

4. **Predation of early nests lowered annual productivity** (5.5, Pg. 25)

5. **Overall nest productivity significantly below long-term average** (4.3, Pg. 8)

6. **56% of the eggs laid produced chicks that successfully left the nest** (5.5, Pg. 26)

7. **Noticeably fewer pairs holding a late territory and having a second brood** (5.6, Pg. 26)

8. **Nest located at 218 metres, the lowest elevation since the study began** (5.3.17, Pg. 23)

9. **Nest aspect chart for all Rosedale nests shows a predominantly easterly trend** (5.7, Pg. 27)

2. INTRODUCTION

The 2014 survey was the 15th 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-owners and head keepers of Spaunton and Rosedale estates.

The 2014 season marked 13 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 2014 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.

Climatic data showing 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. In addition local data has been overlaid on charts showing the average April first-egg date for each year since 2009 in respect of April mean temperature and total rainfall.

For the first time a more detailed look at the late to early territory occupancy as well as nest aspect is considered. The considerable data that has been gathered over the last 15 years has now made a more detailed study of these aspects of the ring ouzel's nesting behaviour possible.

Finally, as in previous years the north-west and east side of Rosedale was covered by Vic Fairbrother and the west side by Ken Hutchinson. Additional visits were also made to Esklets and Farndale east following reports of ring ouzel activity in these areas; the outcome being the location of four nests and much valuable nest data.

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	• Single bird observed in suitable nesting habitat. • Male seen or heard singing on one survey date only.
Probable	• 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	• 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, Loskey Side, 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 2014.

	Location (all territories recorded to date)	NGR	Year													
			99	00	02	03	04	05	06	07	08	09	10	11	12	13	14
1.	Spaunton Moor - Spindle Thorn	SE 716 930	?	×	✓	×	×	×	×	×	✓	×	×	?	✓	✓	✓
2.	Spaunton Moor - Spaunton Knowl	SE 717 918	?	?	?	?	?	?	?	?	?	?	?	?	✓	×	×
3.	Spaunton Moor - Loskey Side	SE 708 933	?	?	?	?	?	?	?	?	?	?	?	?	?	×	✓
4.	Spaunton Moor - Loskey Ridge west	SE 714 934	?	✓	✓	✓	×	×	✓	×	×	×	×	?	×	×	×
5.	Spaunton Moor - Loskey Ridge east	SE 715 935	?	×	×	✓	✓	✓	×	×	×	×	×	?	×	×	×
6.	Rosedale west - Bank Top	SE 720 951	✓	✓	✓	✓	×	×	✓	×	×	×	×	✓	✓	✓	✓
7.	Rosedale west - Bank Top east	SE 725 945	?	×	×	✓	×	✓	×	×	×	×	×	×	×	×	×
8.	Rosedale west - Hob Crag quarry area	SE 714 954	?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ ✓
9.	Rosedale west - Hob Crag north	SE 712 956	×	×	×	×	×	×	×	×	×	×	×	✓	×	✓	×
10.	Rosedale west - Thorgill Bank quarry	SE 707 958	?	×	×	✓	×	×	✓	×	×	×	×	×	✓	✓	✓
11.	Rosedale west - Thorgill Head	SE 670 956	?	×	✓	✓	✓	✓	×	×	×	×	×	×	×	×	✓
12.	Rosedale west - Sheriff's Pit	SE 697 963	✓	✓	✓	×	✓	✓	✓	×	✓	✓	✓	✓	✓	✓	✓
13.	Rosedale west - Sheriff's Pit (south)	SE 698 961	×	×	×	×	×	×	✓	×	×	×	×	×	×	×	×
14.	Rosedale west - Round Hill (south)	SE 694 968	?	×	✓	✓	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓
15.	Rosedale west - Round Hill (west)	SE 693 971	×	×	✓	×	×	×	×	×	×	×	×	✓	✓	✓	✓
16.	Rosedale west - Round Hill (north)	SE 693 974	?	×	×	×	×	×	×	✓	×	×	×	×	×	×	×
17.	Rosedale west - Round Hill (east)	SE 694 970	?	×	✓	✓	✓	×	×	✓	✓	✓	✓	✓	✓	×	✓
18.	Rosedale west - Sledge Shoe Bents	SE 691 978	?	✓	✓	✓	✓	✓	✓	×	×	✓	×	✓	✓	✓	✓
19.	Rosedale west - Matty Carr quarry	SE 688 984	?	×	×	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓
20.	Rosedale west - Matty Carr (south)	SE 690 980	?	×	×	×	×	✓	×	✓	×	×	×	×	✓	×	×
21.	Rosedale west - Lion Inn (north)	SE 680 999	×	×	×	×	×	×	×	×	×	×	×	×	×	✓	×
22.	Rosedale west - Lion Inn (south)	SE 681 999	×	✓	✓	✓	×	✓	×	✓	×	×	×	×	✓	✓	✓
23.	Rosedale west - Blakey Swang	SE 685 998	?	?	?	?	?	?	?	?	✓	×	×	×	×	×	×
24.	Rosedale west - Dalehead (north)	NZ 680 013	✓	×	✓	×	✓	×	×	×	✓	×	✓	✓	✓	×	✓
25.	Rosedale west - Dalehead (west)	NZ 680 008	×	×	✓	✓	✓	✓	✓	✓	×	✓	×	✓	✓	✓	×
26.	Rosedale east - Dalehead (east)	NZ 686 008	×	×	×	✓	✓	×	×	×	×	×	×	✓	×	×	×
27.	Rosedale west - Dalehead (south)	NZ 682 005	×	×	✓	×	×	×	×	×	×	×	×	×	×	×	×
28.	Rosedale east - Dalehead (quarry east)	NZ 685 006	×	×	×	×	×	×	×	×	×	×	✓	×	×	×	×
29.	Rosedale east- Dalehead (quarry west)	NZ 683 008	×	×	×	×	×	×	×	×	×	×	✓	✓	✓	✓	×
30.	Rosedale east - Reeking Gill (cutting)	NZ 689 007	×	×	×	×	×	×	×	✓	✓	×	✓	×	✓	✓	×
31.	Rosedale east - Reeking Gill (west)	NZ 690 007	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓
32.	Rosedale east - Reeking Gill	NZ 691 007	✓	✓	✓	×	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
33.	Rosedale east - Reeking Gill quarry	NZ 692 005	×	×	×	×	×	×	×	×	×	×	×	×	×	✓	✓
34.	Rosedale east - Reeking Gill (south)	NZ 692 003	×	×	×	×	×	×	×	×	×	×	×	✓	✓	✓	✓
35.	Rosedale east - Nab Scar (north)	NZ 694 000	×	✓	×	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	×
36.	Rosedale east - Nab Scar (south)	SE 695 999	×	×	×	×	×	×	×	×	×	×	✓	×	✓	×	✓
37.	Rosedale east - Sturdy Bank	NZ 699 000	✓	✓	✓	✓	×	×	×	×	✓	✓	✓	✓	✓	✓	✓
38.	Rosedale east - East Mine	SE 705 989	?	?	?	?	?	?	?	?	✓	×	×	×	✓	×	×
	TOTAL		**5**	**9**	**16**	**16**	**12**	**13**	**12**	**11**	**12**	**9**	**12**	**16**	**23**	**20**	**21**

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 the Rosedale area in 2014.

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 2014 - other than the Rosedale area and passage migrants.

4.2 Nest Sites

Table 2: Summary of ring ouzel nest sites monitored in 2014.

No.	Location	Grid Ref.	Outcome	Comment
1.	Rosedale west - Round Hill west	SE69269706	Fledged	1st nest.
2.	Rosedale west - Round Hill west	SE69249709	Predated	2nd nest.
3.	Rosedale west - Round Hill east	SE69419681	Fledged	1st nest.
4.	Rosedale west - Blakey Lion south	SE68269954	Fledged	1st nest.
5.	Rosedale west - Hob Crag quarry	SE71379543	Predated	1st nest.
6.	Rosedale west - Thorgill Bank quarry	SE70739582	Predated	1st nest.
7.	Rosedale west - Thorgill Head	SE69909668	Predated	Replacement nest, 1st nest predated.
8.	Rosedale west - Spindle Thorn	SE71319313	Fledged	1st nest.
9.	Rosedale west - Matty Carr quarry	SE68809836	Fledged	1st nest.
10.	Rosedale west - Sheriff's Pit	SE69809625	Fledged	1st nest.
11.	Rosedale west - Sheriff's Pit	SE69739627	Fledged	2nd nest.
12.	Rosedale east - Reeking Gill west	NZ69030069	Predated	1st nest. Eggs taken.
13.	Rosedale east - Reeking Gill quarry	NZ69170053	Predated	1st nest. Eggs taken.
14.	Rosedale east - Reeking Gill south	NZ69280044	Fledged	1st nest.
15.	Rosedale east - Reeking Gill	NZ69120066	Fledged	2nd nest.
16.	Rosedale east - Nab Scar south	SE69529986	Predated	Replacement nest, 1st nest predated.
17.	Farndale east - Breckon Bank	SE68699508	Fledged	1st nest.
18.	Farndale east - High Blakey Moor	SE66679945	Fledged	1st nest.
19.	Esklets east - Esklets Crags south	NZ66250159	Not known	1st nest.
20.	Esklets east - Esklets Crags north	NZ65910236	Not known	1st nest.

Further details of Rosedale territories and nests can be found in sections: 4.5, 4.6, 5.3 and 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 between 2000 and 2014. (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
14	20[g]	11	14 (3)	12 (1)[3]	9(2)	4	40	3.64	2.86
							Overall Mean	**3.75[h]**	**3.23**

Note

a. Mean fledged young per successful nest (Column 9) = Column 8 ÷ Column 3
b. Mean fledged young per laying pair (Column 10) = Column 8 ÷ Column 4
c. A pair had two unsuccessful attempts before being successful at the third attempt.
d. A pair had one unsuccessful attempt before being successful at second attempt.
e. A pair had two unsuccessful attempts; 1st was predated at the chick stage, 2nd at the egg stage.
f. A pair had four nests; 1st was abandoned, 2nd was predated at egg stage, 3rd & 4th were successful.
g. The outcome of two nests located in Esklets is unknown as no final visit was made.
h. Mean for: Glen Esk (Burfield) 3.48; Moorfoots (Burfield) 3.50; Yorkshire Dales (Appleyard) 3.60; BTO Nest Records (Flegg & Glue) 3.60.

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 h. 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 14 pairs were located and monitored in 2014. Two of these, Sheriff's Pit and Round Hill west, had a second nest which were also monitored.

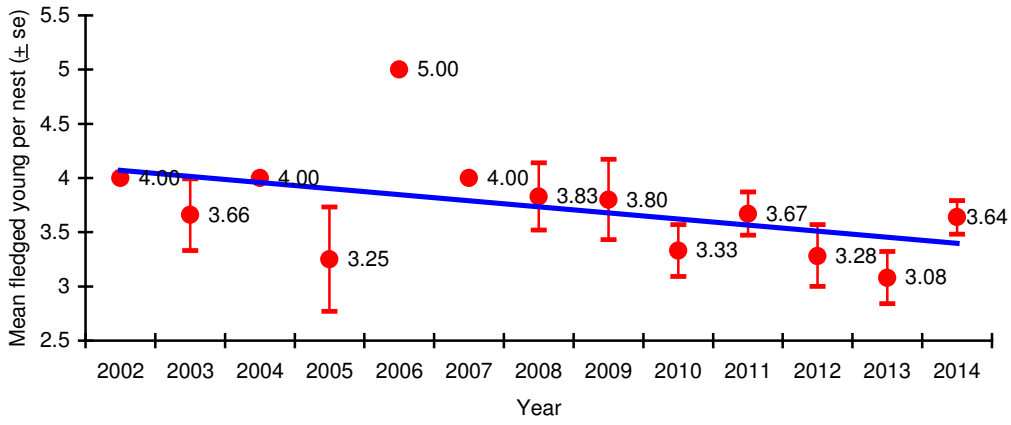


Figure 1: Annual mean fledged young per successful nest for Rosedale and other areas of the North York Moors between 2002-2014 showing 13-year trend.

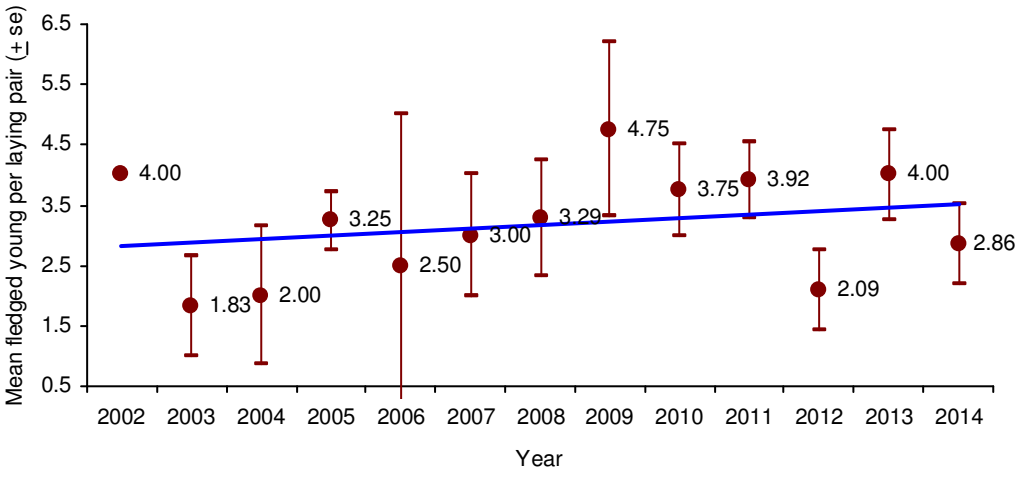


Figure 2: Annual mean fledged young per laying pair for Rosedale and other areas of the North York Moors between 2002-2014 showing 13-year trend.

4.4 First-egg Laying Dates

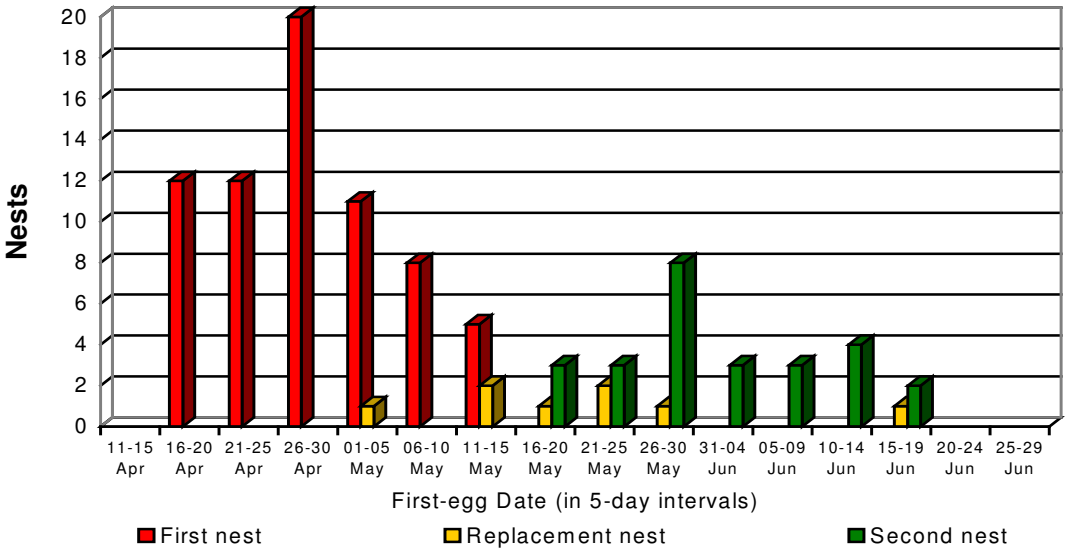


Figure 3: First-egg laying dates for Rosedale and other areas of the North York Moors between 2000-2014. Date points in 5-day intervals from April to June. (n=102)

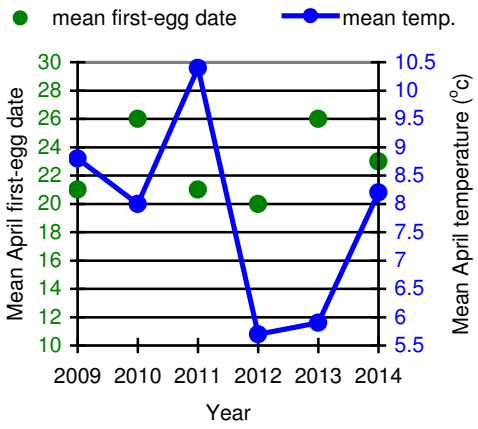


Figure 4: Mean April first-egg date and temperature for the North York Moors for the six-year period from 2009 to 2014. (data from Fig. 7)

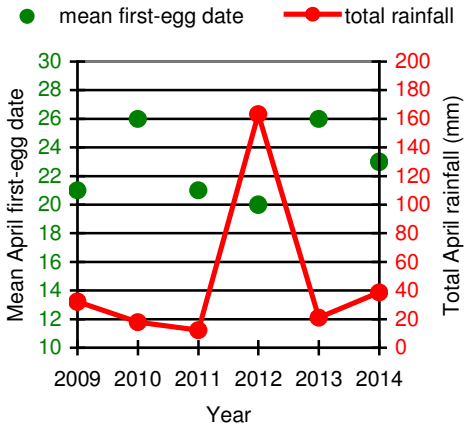


Figure 5: Mean April first-egg date and total April rainfall for the North York Moors for the six-year period from 2009 to 2014. (data from Fig. 7)

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

Year	Nest location	1st Egg	Hatching	Fledging	Comments
2011	Hob Crag	19 April	4 May	17 May	1st nest. In nest on 16th ready to fledge.
	Round Hill east	18 April	3 May	17 May	1st nest. In nest on 16th ready to fledge.
	Round Hill west	10 May	25 May	7 June	1st nest. In nest on 6th ready to fledge.
	Matty Carr	17 April	2 May (a)	16 May	1st nest. In nest 14. Fledged & by nest 16.
	Sturdy Bank 1st	21 April	6 May (a)	19 May (a)	1st nest.
	Sturdy Bank 2nd	28 May	12 June (a) (p)	-	2nd nest. 3 hatched on 12th. Predated.
	Nab Scar north 1st	21 April	6/7 May (a)	20 May (a)	1st nest. 2 eggs hatched on 6th & 2 on 7th
	Nab Scar north 2nd	26 May	10 June	23 June (a)	2nd nest. 3 pulli. 1 egg unhatched.
	Reeking Gill 1st	16 April	1 May	14 May (a)	1st nest.
	Reeking Gill 2nd	19 May	3 June (a)	17 June (a)	2nd nest. 3 eggs hatched on 3rd.
	Ousegill	28 April (a) (p)	-	-	1st nest. Likely predated at egg stage.
	Dalehead west 1st	23 April	8 May	21 May	1st nest.
	Dalehead west 2nd	29 May	13 June	26 June	2nd nest. In nest 24/6, out of nest 27th.
	Dalehead north	8 May	23 May	6 June (a)	1st nest.
	Dalehead quarry wst 1st	28 April	13 May	27 May (a)	1st nest.
	Dalehead quarry wst 2nd	?	(p)	-	2nd nest. Predated at chick stage.
	Dalehead east	25 May (a)	9 June	22 June	Likely to be 2nd nest.
	Thorgill Bank	18 May	2 June (a) (p)	-	Likely to be 2nd nest. Predated.
	Sheriff's Pit	30 May	15 June	27 June	Likely to be 2nd nest.
2012	Reeking Gill cutting	17 April	2 May (a)	16 May (a)	1st nest. 3 eggs hatched 2/5. 14 days to fledged.
	Sturdy Bank	27 April (a)	-	-	1st nest. Abandoned at egg stage.
	Nab Scar south	20 April (a)	5 May (a)	19 May (a)	1st nest. 2 hatched 5th. 14 days to fledged.
	Dalehead west	-	-	-	1st nest. Abandoned at egg stage.
	Sheriff's Pit north	21 April	6 May	19 May (a)	1st nest.
	Sheriff's Pit	28 May	12 June	25 June (a)	2nd nest.
	Round Hill south	29 April	14 May (a)	(p)	1st nest. Predated between Day 5 & 8.
	Reeking Gill	23 April	8 May (a)	22 May (a)	1st nest. 14 days to fledging.
	Blakey Lion	10 May	25 May (a)	7/8 (a) June	1st 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 2nd 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	?	-	-	2nd nest. Predated at egg stage.
	Spaunton Knowl	22 April	8 May	(o)	1st nest. 3 pulli. Outcome unknown.
2013	Reeking Gill cutting	-	-	-	1st nest. 4 eggs laid. Found abandoned 19/5.
	Sheriff's Pit 1.	25 April	10 May	24 May	1st nest. 2 fledglings seen close to nest on 27/5.
	Sheriff's Pit 2.	3 June	19 June	1 July	2nd nest. 3 possibly Day 6 stage on 24/6. 1 near nest 8/7.
	Reeking Gill 1.	27 April	12 May (a)	25 May	1st nest. 3 hatched 12th & 1 on 13th. Likely fledged 25th.
	Reeking Gill 2.	28 May	12 June	24 June	2nd 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	1st nest. 2 pulli at Day 6 on 22/5. 2 eggs unhatched.
	Reeking Gill south 2.	5 June	20 June	3 July	2nd nest. 4 pulli on 21/6 at Day 2 stage.
	Hob Crag quarry 2.	25/26 April	-	-	2nd nest, 1st clutch, predated at egg stage.
	Hob Crag quarry 3.	5 May	20 May (a)	2 June (a)	3rd nest, 2nd clutch. 3 hatched 20/5. 2 pulli in nest on 1/6.
	Hob Crag quarry 4	12 June	25 June	7 July	4th nest, 3rd clutch. Day 3 27/6. Likely fledged at 12 days.
	Dalehead west	28 April	13 May (a)	26 May	1st nest. 1 hatched, 3 eggs on 13th.
	Round Hill west	14 May	29 May	11 June (a)	Likely late 1st nest. 4 pulli fledged 11/6.
	Round Hill south 1	2 May	17 May	31 May	1st nest. Possibly 14 days to fledging.
	Round Hill south 2.	16 June	1 July (a)	13 July (a)	2nd nest. Fledged at 12 days. One dead left in nest.
	Blakey Lion north	3 May	18 May	30 May	1st Nest. Likely to have fledged at 12 days.
	Sturdy Bank	2 May	17 May	30 May	1st nest. Day old fledgling found in nest area on 31/5.
	Blakey Lion south	12 May	27 June	9 June	Likely late 1st nest. Day old fledgling found on 10/6.
	Hob Crag north 1.	15 May	30 May	12 June	Likely late 1st nest. Day old fledgling found on 13/6.
	Hob Crag north 2.	19 June	4 July (a)	-	Late 2nd nest. 3 eggs on 27/6. Day 1 on 4/7. Predated.
2014	Round Hill west	16 April	1 May	15 May	1st nest. 4 eggs laid, 3 pulli seen at Day 11. Likely fledged 15/5.
	Round Hill west	30 May	14 June	-	2nd nest. 4 pulli seen at Day 6 on 19/6. Found predated on 23/6.
	Round Hill east	27 April	12 May (a)	25 May	1st nest. 4 eggs, 3 newly hatched & 1 egg on 12/5. All 4 fledged 25/5.
	Blakey Lion south	27 April	12 May (a)	25 May	1st nest. 4 eggs laid, 3 newly hatched & 1 egg on 12/5. All 4 fledged 25/5.
	Hob Crag quarry	18 April	4 May	-	1st nest. 4 pulli at Day 2 on 5/5. Found predated on 12/5.
	Thorgill Bank quarry	19 April	5 May	-	1st nest. 2 eggs 1 pullus just hatched 5/5. Found predated on 12/5.
	Thorgill Head	14 May	29 May	-	Replacement nest. Sitting on 2/6. Found predated 5/6 at 3 days. 1 egg left.
	Matty Carr quarry	1 May	16 May	28 May	1st nest. 4 eggs. 4 pulli Day 4 19/5. 3 seen on 26/5. Likely fledged 12 days.
	Sheriff's Pit	4 May	19 May	30 May	1st nest. 4 eggs. 4 seen 29/5 11 days. Nest empty & 2 dead near nest 30/5.
	Sheriff's Pit	8 June	23 June	06 July (a)	2nd nest. 3 pulli seen in nest on 30/6 at Day 8.
	Spindle Thorn	25 April	10 May	23 May (a)	1st nest. 4 pulli seen at Day 11 on 20/5. In nest on 22/5 out of nest on 23/5.
	Reeking Gill west	-	-	-	1st nest. 4 eggs on 30/4. Found predated at egg stage.
	Reeking Gill quarry	-	-	-	1st nest. 4 eggs on 30/4. Found predated at egg stage.
	Reeking Gill south	24 April	9 May	20 May (a)	1st nest. 4 eggs laid. 4 days old on 13/5. Fledged at 11 days.
	Reeking Gill	2 June	17 June (a)	29 June	2nd nest. 2 pulli & 2 eggs 17/6. 3 pulli seen in nest 28/6. 1 dead in nest.
	Nab Scar south	15 May	-	-	Replacement nest. Predated at egg stage.
	Farndale - Breckon Bank	19 April	5 May (a)	18 May (a)	1st nest. 2 eggs & 2 newly hatched on 5/5. 2 fledglings close to nest on 18/5.
	Farndale - High Blakey Moor	25 April	10 May	22 May (a)	1st nest. 4 eggs laid, 4 pulli at Day 6 on 15/5. Fledged at 12 days.
	Esklets -Esklets Crags south	26 April	11 May	(o)	1st nest. 4 eggs laid, 4 pulli at Day 5 on 15/5. Not checked after 15/5.
	Esklets -Esklets Crags north	26 April	11 May	(o)	1st nest. 4 eggs laid, 4 pulli at Day 5 on 15/5. Not checked after 15/5.

(a) = actual (o) = outcome unknown (p) = predated

Dates other than actual are based on a 29 day breeding cycle assuming female commences sitting on 3rd 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 **87.3** metres and **60** metres respectively (n=24).

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	1st nest - Sheriff's Pit 2nd nest - Sheriff's Pit south
2008	Hob Crag	SE7144295395	SE7138795446	75	2nd is replacement nest
2008	Sturdy Bank	SE6989499907	SE6986599899	30	
2009	Round Hill south/Sheriff's Pit	SE6953396742	SE6972596266	513	1st nest - Round Hill south. 2nd nest - 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	2nd nest on top of 1st nest.
2011	Nab Scar north	SE6945099957	NZ6943800004	48	
2012	Sheriff's Pit north/Sheriff's Pit	SE6967796429	SE6972596266	168	2nd nest as used in 2011.
2013	Hob Crag quarry	SE7144095390	SE7137095430	83	1st & 2nd fledged nests.
2013	Hob Crag quarry	SE7138095420	SE7144095390	67	Predate & 1st 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	
2014	Round Hill west	SE6926197061	SE6923897087	32	
2014	Sheriff's Pit	SE6979696247	SE6972696269	70	
			Mean Distance	**87.3**	**metres**
			Median Distance	**60.0**	**metres**

5. DISCUSSION

5.1 Climate

5.1.1 Local Observations

March: In sharp contrast to 2013 March saw little rain and no significant fall of snow. Daytime temperatures often exceeded 10°c and night-time frost occurred on only a few days. For most of the month an anti-cyclone positioned over the Bay of Biscay dominated the weather pattern, bringing light south-westerly winds and a warm air flow that provided ideal conditions for migration. The end of the month saw the anti-cyclonic conditions replaced with a low-pressure system with conditions becoming more unsettled and winds moving round to an easterly direction.

April: The unsettled conditions continued into the first week of the month before a high pressure system became established leading to a more settled period during the middle of the month before a return to more changeable conditions for the last week. Temperatures were above the seasonal average for most of the month with the second half seeing highs of 15°c on several days and overnight temperatures falling below freezing on just two nights, the mild conditions prompting a number of birds to start nesting. Rainfall was below the norm for the month with the middle period being mainly dry. Only during the final week, when more unsettled conditions returned, was there any significant rainfall.

May: The late April conditions continued into the early part of May resulting in day time temperatures that struggled to get into the mid-teens. A deep low pressure system passed through the region on the weekend of the 10th to 11th resulting in some unusually strong winds and above average rainfall. Anti-cyclonic conditions became established towards the second half of the month with no significant rain between the 12th and 22nd. This period of dry weather also saw daytime temperatures in the low 20s giving a feeling that summer had at last arrived. But it was all change by the 23rd when day time temperatures dropped to around 10°c to 12°c for the closing days of the month when around 50mm of rain fell between the 23rd and 29th.

June: The unsettled conditions continued into the first week of June before high pressure became established around the middle of the month only to be replaced by more unsettled weather towards the end. Temperatures were generally above average with warm days and mild nights with day-time highs of 20°c being typical. Temperatures started to slide in the last week when day-time highs struggled to reach 15°c. The month remained largely dry with rainfall being well below average. Only the 3rd of the month saw any significant rainfall when more than 30mm fell.

July: The dry conditions continued with a spell of fine and warm weather for the first week of the month before unsettled weather returned with showers occurring most days until the middle part of the month. A fresh to strong north-east wind during this period saw day time temperatures drop to the mid-teens. The remainder of the month saw negligible rainfall and temperatures recover with highs most days exceeding 20°c.

Graphs of temperature and rainfall for the months April to July 2014 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 2014 at Westerdale, while Figure 8 charts the regional mean temperatures and rainfall for the years 2001 to 2014.

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

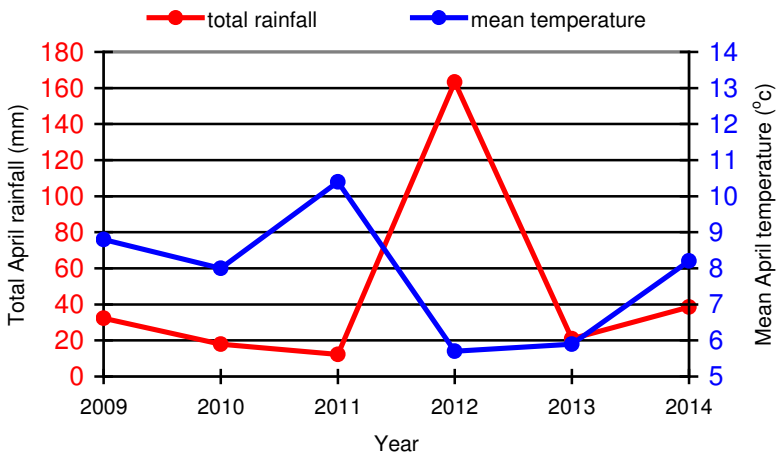


Figure 6: Mean temperature and total rainfall for the month of April recorded at Westerdale, North York Moors, between 2009 and 2014.

5.1.2 Regional Values

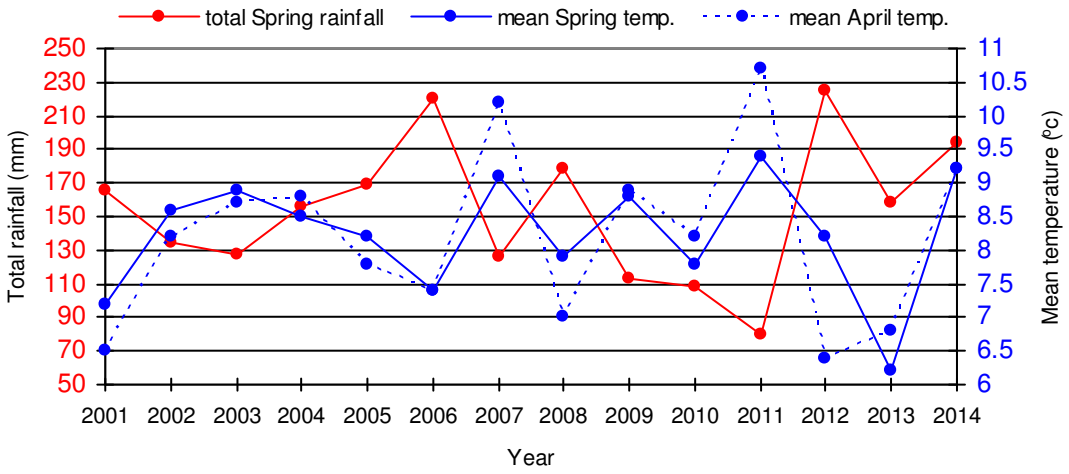


Figure 7: Spring and April mean temperatures and total rainfall between 2001 and 2014.
(Data for Met Office North-East England region. Spring = March, April, May)

5.2 First Arrivals

Rosedale was monitored for first arrivals from March 14th, one week prior to the previously recorded first arrival date. The first ring ouzel to be recorded in Rosedale in 2014 was a single male on the east side of the dale at East Mines on 21st March; this equals the previous earliest record at Reeking Gill on 21st March 2012. On the 22nd a single male was seen on the west side at Hob Crag quarry and a male and female at Round Hill south. Females usually arrive in Rosedale about a week after the first males but there have now been several instances of females arriving with or on the same day as the early males. Two males were seen at East Mines on the 24th and a singing male heard at Reeking Gill on the 25th that was later seen in a larch tree below the embankment. On 3rd April a male and female were seen at Blakey Lion north and a single male at Reeking Gill. By 8th April several pairs were seen on both sides of the dale in well known territories with males heard singing at Reeking Gill and Hob Crag. The late March weather conditions proved near perfect for birds migrating from the south and by mid-April the continuing mild conditions had several pairs building early nests, the first egg being laid on 16th at Round Hill west.

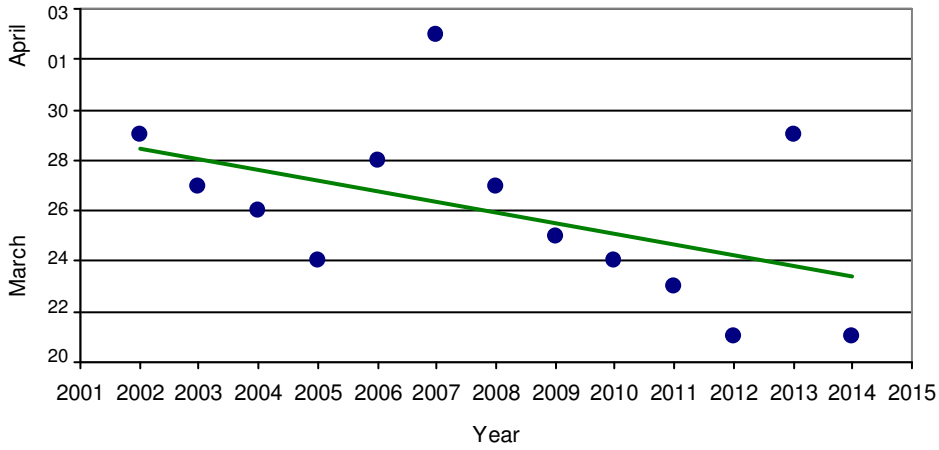


Figure 8: First-arrival date and 13 year trend for the Rosedale area of the North York Moors for the period 2002 to 2014.

5.3 Rosedale Territories and Nests

Twenty one ring ouzel territories were recorded in 2014 in the Rosedale area of the North York Moors; second only to 2012 when 23 territories were recorded. Most territories had been occupied before and some, such as Hob Crag, Reeking Gill, Round Hill south and Sheriff's Pit, almost annually since 1999. Two territories were recorded for the first time in 2014; Reeking Gill west and Loskey Side, where a pair with newly fledged young was seen by the moor keeper.

A significant breakthrough in 2014 was the discovery of a nest at Spindle Thorn, previously recorded as an area of Probable breeding but where all attempts to date to locate a nest had proved unsuccessful. This changed in 2014 when a nest was found on the steep heather bank alongside Loskey Beck. Spaunton Moor is the lowest part of the core study area having had several nests below 250 metres but at 218 metres this nest is the lowest so far recorded.

A total of 38 territories have been recorded in the Rosedale area between 1999-2014 (Table 1). The location of the 2014 territories is shown at **Annex 1**.

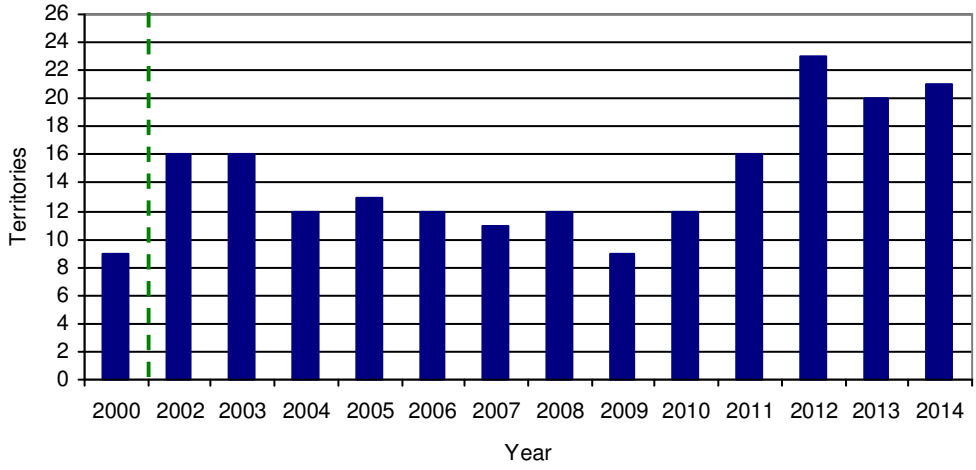


Figure 9: Territories recorded in the Rosedale area of the North York Moors Between 2000 and 2014. (foot & mouth prevented field work in 2001)

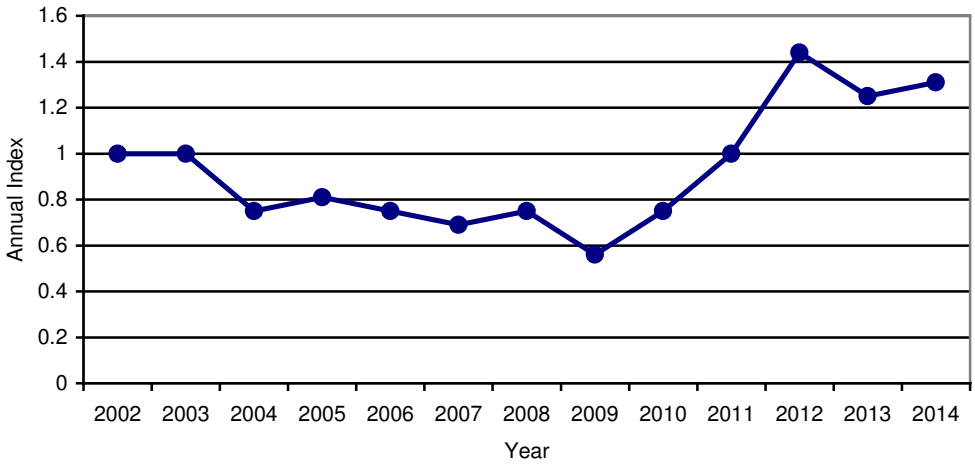


Figure 10: Annual indices of territories recorded in the Rosedale area of the North York Moors between 2002 and 2014 referenced to 2002.

5.3.1 Bank Top

The first sighting at this location was on **25th March** when two birds were seen chasing each other below the Bank Top cottages. No further sightings were recorded until **8th April** when a male and female were seen feeding together part way down the incline. On the morning of **14th April** a single male was feeding on the incline and flew off chacking over the kilns towards the moor top and out of sight. A later visit in the afternoon found a small flock of three males and two females feeding together half way down the incline, what was likely to be a small party of Fennoscandian birds on passage.

Despite weekly visits to the area there were no further sightings until **26th May** when a male was seen on the grassy bank by the kilns singing. After a few minutes it flew off over the kilns moor side and out of sight. Some 10 minutes later a pair were seen flying high over the kilns from the moor top but were lost sight of when they dropped to ground below the kilns. On **2nd June** a male and female were seen below the kiln in the area around the spoil heaps collecting worms. Both lost from view in the general area of the spoil heaps, a cold search of the area found no evidence of a nest.

Three days later on **5th June** both were seen again collecting worms from the same area below the kilns and flying high over the kilns towards the moor plateau. Observation from a grouse butt where the male was later seen taking food and occasionally singing suggested they were feeding fledglings in the heather. A closer look at the few likely clumps of heather near to the butt found an empty nest at SE71879463. This was on the moor plateau on level ground in a clump of heather that had escaped burning and was essentially built on the ground under the heather, the condition of the nest suggested it was this year's nest and the chicks had fledged just a few days prior to its discovery. A further sighting of the male was made on **9th June** when he was seen collecting worms in the same area below the kilns and then flying off over the kilns towards the moor top. Again on **16 June** both adults were seen near the cottages collecting worms and after 10mins or so flying off towards the moor top and out of sight. No fledglings were seen or heard and there was no further sighting of the adults after this date.

The Bank Top territory has been used most years since the study commenced but all attempts in recent years to locate a nest have failed. The finding of a nest high on the moor well away from the pressures that this area experiences in the summer months from visitors, shows just how ring ouzels can readily adapt and remain relatively undisturbed from people pressure.

5.3.2 Blakey Lion south

This had always been a tricky site to observe particularly at times when there was a steady passage of hikers and cyclists passing to and from the Lion Inn up on the Blakey Road. On **30th April** it took about 50 minutes of disrupted observation of a trackside heather bank before a female was finally watched back on to a nest containing four eggs. There were still four eggs

present on **8th May** and a fortunately timed visit on **12th May** revealed three newly hatched chicks and one remaining egg. Four well grown chicks within a day or two of fledging were still present on **22nd May** and the nest was empty on **26th May** with the adults giving warning calls just below the track. Fresh droppings in the vicinity of the nest also indicated successful fledging. A fledgling was later flushed from the trackside 25 metres north of the nest on **31st May.**

5.3.3 Dalehead north

Alerted by distant singing from north of the embankment on **29th May**, a male was located on a shooting screen where he sang before dropping to the ground to feed. It was soon apparent that he was gathering food and eventually he was seen to fly to a distinctive heather clump on the eastern flank of the gill and then emerge without food.
Eventually the female also appeared with a beak full of food but she was much more cautious than the male moving quite a distance up and down the gill side before returning to the exact spot the male had visited.
When the suspected nest site was approached several fledglings and an adult flew high across to the North West side of the gill. It was really disappointing to have missed a nest but confirmed breeding and successful fledging at Dalehead North was still welcome news.

5.3.4 Hob Crag quarry/area

An early arrival at this site was recorded on **22nd March** when a male with a bright gorget was seen foraging in the grassy area north of the quarry and later chacking from the top of the quarry wall. On **31st March** a male and female were seen entering the main part of the quarry from the north, the male landing in a bush on top of the quarry and the female dropping onto a shelf half way up the quarry wall behind some scrub growing out of the wall. Both flew off after a few minutes in a northerly direction and out of sight.
On **8th April** a single male was observed for 30 minutes foraging by the intake wall below the quarry while a pair flew into the quarry landing on a large boulder just below the main part of the quarry, the male singing a mixture of simple and complex song for two minutes or so. The female later flew to a tree above the quarry before flying off over the moor top and out of sight.
Further sightings of a single male and three females were recorded on **14th April** part way down the daleside below the northern end of the quarry. The male was seen to chase off two of the females over the intake wall before rejoining the lone female. On entering the main quarry area on **25th April** a female flew out of a clump of heather at the north end of the quarry and flew into the dale bottom closely pursued by a male - a later cold search found no evidence of a nest.
While walking towards this area to check for a nest a female flew out of the central part of the quarry from a position close to where a nest was found in 2013. A closer look found a newly constructed nest adjacent to last year's in a position that was impossible to get to and required a mirror on a stick to see inside. The distance between this nest and where the second female was seen flying out of the heather at the north end of the quarry was 75 metres.
Returning on **28th April** the female flew off on approaching the nest and a quick check with a mirror found four eggs. Checking the nest on **5th May** four pulli were seen estimated to be one day old. A further inspection on **12th M**ay found the nest predated with the male singing from a nearby tree. The female was seen later flying off the moor and landing below the quarry in the dale bottom. On **2nd June** a male and female were seen in the meadow at the south end of the quarry feeding a juvenile that looked to be around one week old. A few minutes later the juvenile flew into the wooded area below the meadow closely followed by the male. Later in the day the male was seen again in the meadow collecting worms and flying into the wooded area.
A male was seen in the main part of the quarry on **9th June** singing and what appeared to be a female flew out from the central part of the quarry into the dale bottom. Spectral analysis of an audio recording made of the singing male showed it to have a strong correlation with a male recorded at Matty Carr quarry on **26th May** - 4km north of Hob Crag. The conclusion was that it was the same male and that it was more than likely unattached and looking to attract a female.
On **26th June** a female and three juveniles about 4 weeks old were seen at the north end of the quarry - one juvenile was seen taking food from the adult bird. All flew off strongly towards the south end of the quarry part way down the daleside and out of sight.
The time line of events shown below for the Hob Crag area points to there being two territories here in 2014, the first time this has been recorded:

- 25th April: Female seen at north end of quarry flying out of heather when second female was on eggs in main part of quarry.
- 5th May: Nest with four pulli estimated to be one day old.
- 12th May: Nest found predated.
- 2nd June: Female and male seen feeding week old juvenile in meadow at south end of quarry.
- 26th June: Female seen with 3 juveniles (one being fed) looking to be up to 4 weeks old at north end of quarry.

5.3.5 Loskey Side

A sighting on **30 May** of a male and female feeding two juveniles at Loskey Beck ford (SE708933) was reported by the under-keeper. This sighting was made the same day as another pair with young were seen by the under-keeper at SE714934 that were most likely from the nest that fledged on **23 May** at Spindle Thorn. Loskey Side is on the extreme edge of the Rosedale study area and has not been surveyed before, largely because of its remoteness. The elevation at the ford where the family were seen is 240 metres.

5.3.6 Matty Carr quarry

On **8th May** a male was seen briefly foraging at the north end of the quarry before flying off towards the dale bottom and out of sight. A close search of the quarry flushed a female from a nest containing four eggs, the nest being very close to one found in 2011. A further inspection on **19th May** found four pulli estimated to be three days old. On checking the nest on **26th May** only three pulli could be seen, all three looked well grown and ready to fledge. During this visit an audio recording was made of a male singing loudly for a long period of time from a tree close to the first nest. A further visit to the quarry on **29th May** found the nest empty with several droppings deposited just outside the nest and some a metre away. Calculations suggest the nestlings fledged at 12 days. On **2nd June** a male was heard singing in the dale bottom and several juveniles were also heard calling.
On **19th June** a male and female were seen in the quarry bottom close to the first nest. The male at one point was seen dropping into the bracken as if feeding young but a later inspection found no evidence of fledglings in the deep bracken. The female flew into a nearby tree chacking before flying towards the dale bottom and out of sight. On **23rd June** a brief sight of a female and possible juvenile was recorded near the first nest, both were lost from view and despite some two hours of monitoring nothing further was seen. There were no further sightings after this date with no evidence of a second nest.
A disturbing development was the discovery on **26th May** of a person setting up a climbing pitch just 20 metres from and directly above the nest site. The nest at the time had young that were being fed by the female and the appearance of the climber cutting heather away at the top of the quarry wall was sufficient to prevent the female going to the nest to feed the young. The climber was spoken to and the situation explained and as a consequence he departed the area saying he would find another pitch. A one metre long length of angle iron that had been driven into the ground and left by the climber was later removed from the quarry top. Both the land owner and National Park Authority were informed of this incident.

5.3.7 Nab Scar south

On **13th May** a male was seen to fly down from the Nab to the wall dale side of the track where a closer inspection also revealed a female feeding within the in-bye. She eventually flew on to the adjacent east wall before dropping down to feed behind mounds just below the track. After a while she reappeared and flew to the steep flanks of the Scar where unexpectedly she stopped feeding and began to collect nest material before flying to the base of rocks near the summit and on into a heather clump. During the next 40 minutes of nest building activity she alternated periods of gathering grass with visits to collect mud from an area of wet, exposed shale lower on the Scar. The nest was not approached at this stage.
Chacking was heard during the climb to the nest site on **16th May** and a female RZ flushed from somewhere below and flew to the wall area where a male sang the simple song. Expecting the female to be off the nest it was a surprise when only one metre from the nest she flushed off and

chacked down to the wall area. The nest looking a little rough and rushed was well tucked in under a small heather shrub and contained two eggs. She appeared to have been sitting.
On **21 May** the nest contained four eggs but it was a matter of some concern that later in the day a magpie was seen being closely pursued by a male on a trajectory from the nest site south along the ridge. The magpie was seen to continue on to Sturdy Bank and then the plantation. The male returned to the nest area and perched on rocks about four metres from the nest.
There were still four eggs on **26th May** with hatching expected on about 29th May but on **5th June** the nest was found to contain only one cold egg. Predation at the egg stage has not previously been a common occurrence in Rosedale. There was no sign of the adults and no disturbance at the nest.

5.3.8 Reeking Gill

April and May had passed without any clear sign of nesting in Reeking Gill although two nearby nests had been predated. Whilst checking along the south east side of the Gill on **6th June** a flushed from the land slip area in the bottom of the gill. A fascinating 20 minutes then spent watching the kestrel chicks at their nest was suddenly interrupted by loud chacking from a female in the rowan tree by the landslip. She promptly flew down in to a heather shrub on the edge of the landslip. A gift! After waiting for 10 minutes the site was approached and she flushed off a very exposed nest on the ground in an open part of heather. The nest looked rather old but had new lining and contained four eggs. A large piece of dead bracken formed a tell-tale marker along the side of the nest.
There were still four eggs on **8th** and **12th June.** There was prolonged drizzle in a strong wind on **17th June** so the nest was not checked until 1335 when the rain had stopped. With no sign of the female and fearing the worst it was a relief to find two newly hatched chicks and two eggs in the nest. This indicated a probable first egg date of 2nd June. It was encouraging to note that there had not been any recent magpie sightings.
Four chicks were present on **23rd June** but only three chicks visible on **28th June.**
On **30th June** the nest was empty and young could be heard calling from the vicinity of the rowan tree at the south end of the embankment. The male sang briefly from this tree before dropping to the ground where a fledgling was located. This was about 150 metres from the nest and may just suggest they fledged at 12 days old (Day 13) on **29th June**.
Later this juvenile was watched being fed by the male and at one point was seen to follow him through the grass and rushes up towards the quarry. Later a juvenile was heard calling from the bracken below the embankment towards the gill bottom. The male was seen to drop into the bracken there carrying worms and then come out and fly into another area of bracken about 20 metres away indicating that two and possibly three fledglings were being fed.
The nest contained the remains of one chick which had not survived to fledge.

5.3.9 Reeking Gill west

A pair was first seen being territorial on **1st April** high on the far side of the cutting and then between **13th** and **21st April** they were observed feeding consistently as a pair dale side of the Gill. They seemed very aware of being watched and gave no clues as to a nest site. Interesting activity just south of the Cutting on a later visit then led to a careful search on **30th April.** A male was heard to chack from the fence at the south end of the Cutting and was seen to fly to a tree on the edge of the promontory where he sang. A second male was then heard singing and shortly afterwards a male was seen to fly in from Reeking Gill south, over the gill and up towards the boundary stone where he too sang. The Cutting male continued to sing in response.
As the bank between the Cutting and the Gill was climbed both the male and female began to chack from the fence alongside the steep path on the opposite side. This prompted a hasty retreat in order to give the female the opportunity to return to the nest. This strategy was rewarded when the female flew in to some heather high on the bank between Reeking Gill and the Cutting. The male then flew north and sang from the wall running dale wards. Returning after the site had been left undisturbed for about ten minutes the male was seen to fly to the fence at the north end of the Cutting and then on through the Cutting. The steep bank was climbed towards the suspected nest location and the female flushed about two metres from a nest containing four eggs. On **5th May** it was unusually quiet as the nest was approached and found to be empty. There were no signs of disturbance. Reeking Gill west is a new territory.

5.3.10 Reeking Gill quarry

On **30th April** a walk through the likely heather areas over Reeking Gill south and down through Reeking Gill quarry was uneventful until a female chacked at the base of the bank at the north end of the quarry between a rowan tree and the Gill before flying over the track and out of sight. A short period of observation from north of the Gill gave occasional views of the female and the male who eventually settled in the rowan tree and sang. At this point attention was diverted to the search for the nest site described above in the vicinity of the Cutting. Success there led to a confident return to the Quarry area and the bank just south of the Gill near the rowan tree. Following a short climb up the bank a female sitting tight flushed off a nest at about two metres. The nest containing four eggs was just south of the Gill and so unusually there was no early nest in Reeking Gill this year but nests nearby on either side of the Gill.
On **5th May** there were still four eggs but on **8th May** it was ominously quiet as the nest was approached and found to be undamaged but empty. Three empty egg shells were later found about five metres from the nest but there was no trace of the fourth.
It was most depressing to lose two nests in close proximity there. The predator was not identified but magpies had been present in the area on a number of occasions.
A magpie was also observed just south Reeking Gill south first sparring with a lapwing and then landing on the path leading up from the track to the Reeking Gill south nest area where it was seen to devour a lapwing chick.

5.3.11 Reeking Gill south

After returning from Sturdy Bank on **13th May** a female was located just north of Nab Scar and by the track above the barns. She flew towards one of the trees below Reeking Gill South and then on uphill moor side and out of sight. A higher vantage point was found from which to watch and the next sighting was of her carrying food in the same direction towards last year's nest sites. After watching from several vantage points without success a nest with four chicks was finally located. Both the adults were observed carrying food to the nest on **16th May.**
It was a cloudy afternoon with thunder rumbling in the distance when the nest site was approached on **20th May** to find the chicks in the process of fledging. Watched from a discrete distance both adults were in the vicinity and carrying food. They chacked and moved closer to the nest area but didn't go right to it and both eventually reappeared without food. They were somewhat agitated but looked down the slope more than at the observer. It gradually became clear that they were flapping their wings and ushering something away, both acting independently at different locations within five to 10 metres of the nest. After about 40 minutes of observation and seeing the weather threatening the nest area was approached and the nest found to be empty. The high pitched calls of the fledglings could still be heard and there was a brief glimpse of one being ushered away by the male.
When the nest was found on 13 May the chicks' eyes were still closed and they appeared to be about four days old when compared with the Sturdy Bank sequence of nestling photos. This indicated an unusually early fledging at about 11 days.

5.3.12 Round Hill east

The first record at this location was on the **8th April** when a male was seen singing from a tree part way down the dale side. A further sighting of a singing male was observed on **28th April** at the same time that a male was seen chacking in a tree at Round Hill south. While observing the area on **5th May** a female flew into a heather bank just below the track. Inspecting the site 30 minutes later flushed a female from a nest containing four eggs. On **8th May** the nest still had four eggs and on **12th May** three newly hatched pulli and one egg were recorded. After observing the nest from a distance on **19th May** without any sign of the adults, the nest was examined and four pulli were seen that were estimated to be seven-days old - the female chacking unseen from a nearby tree. The parent birds were observed from a distance on **22nd May** going to the nest with food but due to poor weather, with driving rain, the nest was not inspected. On **26th May** the nest was found to be empty with several deposits around the rim of the nest and on a twig close by. Later both adults were seen going into the heather 20 metres from the nest with food and the juveniles heard calling to the parents. The male was also heard counter singing with the Round Hill west male.

No further sightings were recorded until **3 July** when a male and two mature juveniles were seen foraging by the track close to the first-nest site. All flew off together towards the dale bottom when they were lost from sight. An interesting observation was the presence of a juvenile blackbird in eclipse plumage foraging with the ring ouzel family and flying off with them when they departed. There was no evidence of a second nest attempt at this site and the juveniles were thought likely to be from the first-nest judging by their mature appearance.

5.3.13 Round Hill south

On **22 March** a male and female were seen feeding together in the meadow below the crags at Round Hill south; early arrivals that likely came together. Further down the meadow close to the intake wall a second male was observed foraging. There were further sightings of the male and female in the same location on **31 March** and as with the earlier sighting they gave the appearance of being a pair as they stayed close together throughout the time they were being observed. On **8th April** a lone male was seen foraging for over one hour in the meadow with no sign of a female. Visiting the area on **18th April** what looked to be an older female was seen for over an hour foraging in the meadow. Using a lure a male responded within a minute landing close by attempting to locate the bird intruding on his territory. Again on **28 April** a male was heard chacking in a tree part way between Round Hill south and Round Hill east and seemed to be responding to the east bird that was in a tree at Round Hill east singing.
Further sightings of a male in and around the meadow were recorded on **5th** and **19th May** with the male on the 19th counter singing with the male at Round Hill east after both birds were seen earlier having what appeared to be a territorial spat on the wall at the top of the Round Hill south crags. On **26th May** a male was observed singing from a wall in the meadow while the male from Round Hill east was seen attending to the juveniles there that fledged the nest around that time. That was the last record of activity at Round Hill south. No nest was found or any hint as to where one could have been and there was no evidence of fledgling activity. Though there were no sightings of a female after **18th April**, the male was clearly holding territory up to the **26th May**. After that date the territory seems not to have been used for a second-nest.

5.3.14 Round Hill west

The first evidence of activity at this site occurred on **28th April** when a female was seen coming from the direction of Sledge Shoe and flying straight into the heather bank at the north end of the track cutting. After a wait of 30 minutes the bank was checked and the female flushed from a nest containing four eggs. A visit on **5th May** found four pulli estimated to be two days old and again on the **8th May** when they were seen to have their eyes open (eyes open on 5th day). On **12th May** both adults were seen close to the nest with beaks full of worms and at one point were observed in the dale bottom standing on a rock face-to-face in what appeared to be a moment of bonding. A brief look at the nest suggested there were now just three pulli. Inspecting the nest on **15th May** found it empty with evidence of fresh droppings close by. The female was seen part way down the daleside about 30 metres from the nest chacking with a beak full of food. On **19th May** the male was seen on a rock in the dale bottom singing before dropping to the ground close to where juveniles were heard calling.
A second-nest was located on **19th June** when both adults were seen entering the same heather bank close to where the first-nest was found. Checking the bank while the adults were away located a nest with four pulli estimated to be five-days old. On **23 June** an inspection of the nest found it empty having been predated when the hatchlings were between five and nine days old. There were no further sightings of the adults after this date.
The heather bank on the west side of the cutting has been used several times in recent years.

5.3.15 Sheriff's Pit

On **28 April** a male was seen on a post close to the pit shaft singing a few notes of simple song before flying off northwards out of sight. Five minutes later the male was seen again on the moorside of the pit shaft preening. A female was later flushed from the side of the track some 70 metres north of the pit. A further sighting of a male and female was made on **5th May** when the pair were flushed from the daleside of the track just north of the shaft. Both flew off daleside out of view. There were no further sightings until **26th May** when a female was seen entering a clump of heather with food just below the track close to the footpath that leads from the pit shaft to

Medds Farm. Searching the area located a nest containing four pulli estimated to be seven days old. The nest was constructed on flat ground under a clump of heather and was remarkable in so much as it was within a few metres of a well used path and that there was no evidence of a nest here in the weeks before its discovery. A further inspection on **29th May** found four pulli being fed by the female. Checking again on **31st May** found the nest empty with two dead pulli very close to the nest that appeared to have been cornered in the thick heather by a predator, one had the head taken off while the other had its stomach partly eaten. A few droppings were found two metres daleside of the nest suggesting the other pulli may have escaped predation. On **5th June** both the male and female were seen going into the heather with food 100 metres from the nest and on one occasion the female was observed trembling her wings before feeding the juveniles; which remained hidden during the period of observation. The likely outcome for this nest was that all four pulli fledged the nest and of these two were taken by a predator just after leaving the nest and the remaining two escaped the predator and survived.
On **19th June** a male and female were seen entering the pit shaft. Looking through the security fence the female could clearly be seen sitting on a nest on the west side of the shaft. As with other nests in past years that have been built in the pit shaft, all observations have to be made at a distance looking through the security fence. For that reason it is impossible at this location to see into the nest itself to count the eggs. Returning on **26th June** both adults were observed taking small amounts of food to the nest, the male singing a soft simple song before entering the shaft. On **3rd July** the adults were seen again entering the shaft this time with beaks full of worms. Looking into the shaft through binoculars it was possible to discern three pulli. A further check on **6th July** saw both adults going into the shaft with worms and to an area 20 metres north of the pit fence. Later two juveniles were heard calling from within the shaft, one clearly visible under a stone lintel on the opposite side of the shaft to the nest, while a third juvenile was heard calling outside the shaft.
The distance between the first-nest outside the pit shaft and the second-nest inside the shaft was 70 metres. The pit shaft has been used 13 times since 2000 for nesting.

5.3.16 Sledge Shoe

The first sighting at this location was on **18th April** when a male and female were seen foraging by the side of the track. Both flew across the dale bottom into a tree before dropping to the ground out of view. **On 8th May** a male was seen singing from the top of a tree towards the south end of Sledge Shoe, while 30 minutes later a brief chack from an unseen bird in the dale bottom caused the singing to end only to recommence after the chacking stopped.
Further sightings were made on **12th May** when the male was seen singing in the same tree at the same time as the adults from Round Hill west were seen taking food to their nest. The singing male was joined by a female that was seen to fly into a gully running down from the track just south of Sledge Shoe. A search of the area found no sign of the female or evidence of a nest. Again on **15th**, **22nd** and **26th May** a male was heard singing from a tree at the south end of Sledge Shoe, though with no sign of a female.
On **23rd June** a juvenile was flushed from the side of the track 200 metres north of Sledge Shoe and flew into the dale bottom out of sight. Later in the day a juvenile was seen in the same place as earlier in the day and again flew daleside out of sight.
This territory has been used many times over the years and though no evidence of a nest could be found there was, however, sufficient activity throughout the season to give this site Probable breeding status.

5.3.17 Spindle Thorn

First evidence of activity here was on **10th April** when a male was seen feeding close to the Hutton-le-Hole to Rosedale Abbey road at Spindle Thorn. A further sighting was made the next day on the west side of the road when a male was again seen feeding in the cratered area just off the road. No further sightings were made until **1st May** when a male and female were seen on the west side of the road feeding and later flying in a wide arc over the road to the east side landing in a grassy area close to the solitary thorn tree. A lone male was also flushed from the area close to the tree. On **6th May** an unidentified ring ouzel was seen to fly from the west side of the road towards the beck. Later both male and female were seen flying from the west to the east side of

the road chacking as they went. A further sighting was made on **17th May** on the east side of the road near the tree.
The long awaited breakthrough at this site was made on **19th May** when, after several years of sightings without any nest evidence, a pair was seen with food in an area close to the beck 700 metres west of the road where they had previously been seen foraging - at one point the female was seen flying out of the heather bank on the west side of the beck. A search of the area found no evidence of a nest and as both adults were clearly agitated all further searching was abandoned for the day. On **22nd May** the breakthrough was completed when a nest was located on the east side of the beck, the nest containing four pulli that were well grown and likely to fledge within the next day or two. The nest elevation was 218 metres with a north-west aspect and was by far the lowest elevation recorded in the Rosedale area. A further check of the nest site on **23rd May** found the nest empty with a fledgling seen 10 metres from the nest.
There has been Probable breeding recorded at this site over a number of years so it was rewarding to now have Confirmed status and to have evidence that ring ouzels in the area can nest at this lower altitude if the habitat is right.

5.3.18 Sturdy Bank

There were regular sightings of apparently territorial birds throughout the season at Sturdy Bank but strangely no evidence of nesting in the gill. This was disappointing after an unbroken sequence of six years nesting within the gill but there were some indications that they may have nested on the moor to the south of the gill.

5.3.19 Thorgill Bank

On **28th April** a female was seen on top of the stone cairn near the quarry entrance and then after a few minutes dropping to ground out of sight. At the same time a male was observed preening in a nearby tree just below the cairn. A cold search 30 minutes later of the quarry flushed the female from the top of a steep heather bank on the west side of the quarry. A close look at the area found a nest containing three eggs. Checking the nest on **5th May** found two eggs and one newly hatched pullus. Returning to the quarry on **12th May** the nest was found empty and to have been predated. There was no evidence of ring ouzels using this territory after this date. This was the first time the quarry had been used for nesting since 2003 when a heather burn in April 2004 destroyed the heather covering the bank on the west side of the quarry.

5.3.20 Thorgill Head

On **12th May**, the same day as the nest at Thorgill Bank was found predated, a pair was seen close to the track at the head of Thorgill gill the female having just come out of the heather bank on the daleside of the track. A closer look at the bank found a nest in the process of being constructed with the finishing touches being made to the mud lining. Later in the day both were seen flying up the gill towards the nest site, the female carrying long lengths of rushes that trailed behind her. Approaching the site cautiously on **19th May** the nest was found to contain five eggs - the close proximity of the nest to the track made it possible to see into the nest from the track and on this visit one egg was clearly visible from a few metres away.
Further visits were made on the **26th**, **29th**, **30th May** and **2nd June**, each time the nest was observed from the far side of the track to the nest and on each occasion the female could be seen sitting tight on the nest with one eye fixed on the outside world. On **5th June** a check on the nest found it predated. The female was just outside the nest and had been partly eaten, of the pulli that were estimated to be about six days old, two were also outside the nest and one in the nest with its head removed - one egg was also in the nest and found to be infertile. The most bizarre finding amongst this gruesome sight was a dead adult frog in the bottom of the nest resting on top of the egg and decapitated pullus.
The predation of an adult bird is unusual as most take flight for self preservation. This may point to a nocturnal predator that caught the female when she was on the nest keeping the chicks warm. It has been suggested that a weasel was the most likely culprit. The pair at Thorgill head were almost certainly the same pair that had a nest in the quarry at Thorgill Bank - which was also predated. The distance between the two nests is 840 metres.

5.4 Farndale and Westerdale Territories and Nests

Following helpful reports from Estate staff and from Chris Tyas additional time was dedicated to Farndale and Westerdale in 2014.

Breckon Bank
On **5th May** a nest was located on the east side of Farndale at an unnamed crag close to Breckon Bank at SE687951. The nest contained two eggs and two newly hatched pulli. Both adults were seen in the vicinity with the female observed carrying food to the nest. A visit on **15th May** found four pulli 10 days old with both adults close by carrying food, the male singing briefly with a distinct Rosedale dialect. The nest was inspected on **18th May** with one fledgling seen perched on the rim of the nest looking out and one fledgling less than a metre away from the nest that after a few minutes flew confidently some 10 metres towards the dale bottom and out of sight. The young fledged at 13 days.
On **9th June** a pair was observed collecting worms in the meadow at the south end of Hob Crag quarry. These were seen flying off with the food high over the moor top in a westerly direction. Both returned a few minutes later to collect worms when again after five minutes were seen heading high over the moor in the same direction as earlier. A compass bearing was taken of the direction they flew which suggested they could have been the pair from Breckon Bank taking food to their second nest chicks. The distance from the first Breckon Bank nest to the foraging area is approximately 2.8km, a round-trip of nearly 6.0km. This long distance foraging behaviour was observed in 2013 at East Mines on the east side of the dale when a pair there were seen carrying food over the moor top between Rosedale and Northdale; a round-trip distance of around 3.0km (see section 5.3.5 of the 2013 Report). The observations at Hob Crag, if the interpretation is correct, and at East Mines show that adult ring ouzels are prepared to travel some distance beyond the more usual 200 to 300 metres range that is typical in the breeding season in order to collect food should the feeding areas closer to the nest prove less than adequate.

High Blakey Moor.
On **3rd May** the track west of the Lion Inn was followed in order to check Gill Wath in Farndale. Here a male was heard singing from the southern end of Round Crag for just a few minutes but too far away to get a recording. Another male was then seen to fly from the same area and across to the west side of Gill Wath towards High Blakey Moor**.** On returning to the track and walking around the head of Gill Wath and on towards Farndale a male was located on the dale side of the track where he was joined by a female a few minutes later. From a crouched position the female was discreetly watched as she made her way cautiously along the shallow cutting before surprisingly popping into the heather on the north side of the cutting. She came out soon afterwards and a quick look while she was gone revealed a nest and four eggs. The male during this time was seen perched on the heather at the far end of the cutting.
The adults were both nearby on **15th May** when the nest was checked and found to contain 4 chicks. The nest site was approached cautiously again on **22nd May** as the chicks were expected to fledge on 22nd or 23rd. As both adults flew from the area a check through binoculars revealed one fledgling standing on the edge of the nest and one fledgling about 30cm away. It was decided not to approach any nearer so as not to disturb them fledging. After retreating some distance the fledgling from the nest could be seen to have moved further away. The site was then left so as not to disturb them as the weather started to deteriorate and their position was relatively sheltered from the heavy rain that threatened.

Esklets Crag South.
After leaving High Blakey Moor on **3rd May** the disused railway track was followed until the Esklets track was reached. Here after a steep descent from the railway track there were distant glimpses of two probable ring ouzels feeding in a grassy area at the south end of Esklets Crags. The valley was crossed and after a short climb towards the crags the area below the rock face was entered from the northern end. When the grassy area was reached a female was immediately located and after she had been watched for about 10 minutes she flew to a point

where there was a heather overhang just a few metres above the ground on the side of the crag. As the site was approached the female flushed from a nest containing four eggs. She remained to chack loudly from a few metres away until she was quickly left in peace.
When the nest was checked on **15th May** four chicks had hatched.

Esklets Crag North.
The route below the crags had been retraced before a brief lunch stop towards the north end of the crags gave time to reflect on the good fortune in finding two nests on the morning of **3rd May**. Here the only other evidence of RZ activity was a very brief chack some distance away beyond the north end of Esklets Crags North. Later refreshed and back on the track and heading north over Westerdale Moor a female RZ was suddenly seen close by the track. She was seen to fly lower down the side of the dale to a grassy area where she foraged for a few minutes before flying back to a spot by the track just ahead of our position. The most likely looking heather bank in a gully just off the track was checked and the female flushed off a nest containing four eggs. The male flew in and landed in a dead tree nearby on **15th May** as the nest site was approached. A quick check of the nest revealed that four chicks had hatched.

Saturday 3rd May had been an exceptionally successful day with the finding of three new nests. It was interesting to note that the location of all three nests was given away very quickly by the unusual behaviour of all three females in flying straight to their nests and not exercising the extreme caution more usually encountered. Owing to the remoteness of the two Esklets nests no further visits were made, the outcome of these nests is therefore unknown.

5.5 Breeding Productivity

The number of predated nests was noticeably higher in 2014 accounting for 39% of all nests (n=18) monitored and markedly up on the 12% recorded in 2013 (see Annex 3, Table 1). This is reflected in the below average figure for productivity shown in Figure 11 below for the mean number of fledged young per laying pair - 2.86 compared with a 13-year mean of 3.17. Of the seven nests predated, three were at the egg stage and four at the pulli stage. One pair had their first nest at Thorgill Bank quarry and then built a replacement nest 840 metres away at Thorgill Head after the first was predated, both were predated at the pulli stage the female also being taken while on the second nest - the first time this had been observed and an unusual occurrence with the female's natural instinct being to fly off and may indicate a nocturnal predator. The early nests at Hob Crag quarry, Reeking Gill cutting, Reeking Gill quarry and Thorgill Bank quarry, were thought to have be predated by aerial predators, most likely magpies though jays were seen nearby, while the nest at Thorgill Head was likely to have been predated by a ground predator, probably a weasel.

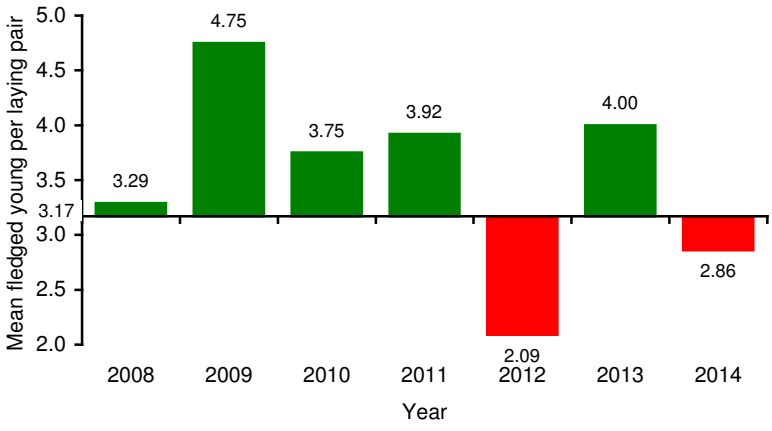


Figure 11: Mean fledged young per laying pair for Rosedale and other areas of the North York Moors between 2008 and 2014 relative to 13-year mean of 3.17

Analysis of the 2014 results at Annex 3 show that for all nests monitored where eggs were laid 77% hatched and 72% of those that hatched fledged (Note: the two Esklets nests are not included as their outcome is unknown). Overall, 56% of the eggs laid in 2014 produced chicks that successfully left the nest and compares with 65% in 2013, 47% in 2012, 71% in 2011 and 63% in 2010.

Figures 12 and 13 below show the annual hatching and fledging success for first and second nests - see 5.6 below. Hatching success looks at all the eggs laid and the percentage of these that hatch. Similarly, fledging success looks at the percentage of eggs laid that fledge young. A value of 1.0 would indicate 100% success whereas 0.5 would indicate 50% success - that is only half of the eggs laid hatched or fledged. In 2014 86% of first nest eggs and 75% of second nest eggs hatched while 67% of first nest eggs and 30% of second nest eggs successfully fledged. The graph at Figure 13 clearly shows that, apart from 2013, second nests in Rosedale have been less successful at fledging young than first nests.

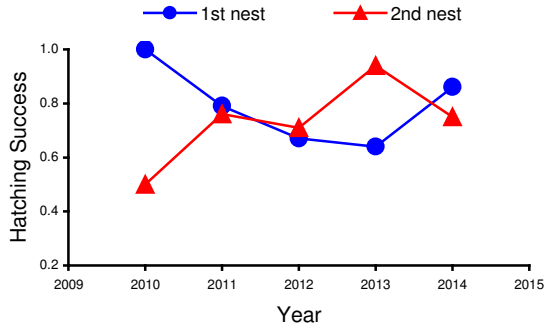


Figure 12: Annual first and second nest hatching success for the Rosedale area of the North York Moors between 2010-2014.

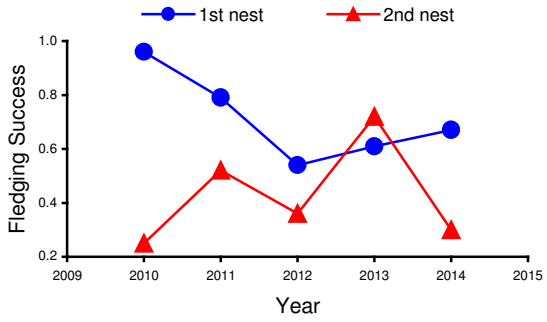


Figure 13: Annual first and second nest fledging success for the Rosedale area of the North York Moors between 2010-2014.

5.6 Late:Early Territory Occupancy

Most bird publications describe the ring ouzel as usually being a double brooded species. As not all pairs will have a second nest and fledge a further clutch, one of the concerns is what impact this has on population numbers. For a short lived species, three years for the average ring ouzel would be a good age, having a second brood may be important in sustaining or expanding the population.

This year's poor productivity prompted a look at the number of pairs that had a second nest (see 5.5 above and Annex 5). The method used was to divide the number of territories that were occupied by pairs after late-May (late territories) by the number occupied before late-May (early territories). The graph at Figure 14 below shows the ratio of late to early occupancy between 2008-2014. Although there is some variation between years the 7-year trend is relatively flat averaging 0.59, suggesting 59 % of Rosedale birds have, on average, a second nest. It also confirms 2014 being a poor year for second nests with just 37% attempting a second clutch.

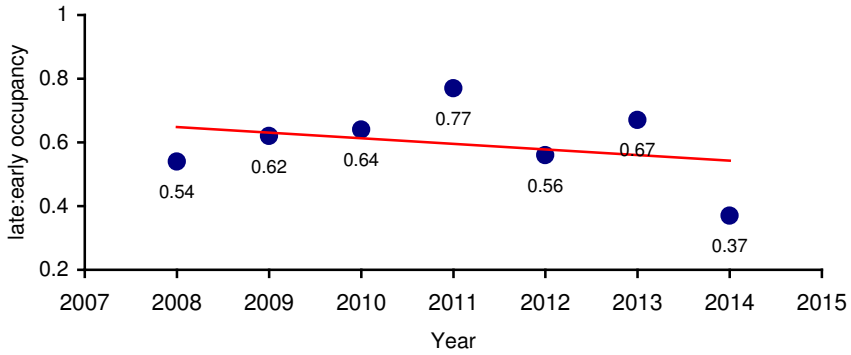


Figure 14: Annual ratio of late to early territory occupancy for the Rosedale area of the North York Moors between 2008-2014 and seven-year trend.

5.7 Nest Aspect

The aspect of a nest is the compass bearing that the nest entrance faces and is the direction the adult birds are seen to use most to enter or exit the nest. It is likely that the topography has a strong influence on nest aspect in Rosedale. The main dale runs NW to SE and on the east side, where it might be expected that more nests would face west, the two main offshoot gills of Reeking Gill and Sturdy Bank and the quarry at Dalehead seem to present fewer opportunities for nests to face this direction. Likewise on the west side of the dale the quarries at Matty Carr and Hob Crag predominantly face east as do the heather banks at Blakey Lion, Dalehead west and Round Hill east and south. Only at Round Hill west where the disused railway cutting has ideal heather banks for nesting, with a choice of either east or west facing aspects, do ring ouzels prefer the side of the cutting facing east. At Sheriff's Pit where the four sides of the shaft entrance are aligned either NE, NW, SW or SE, the preferred aspect is either SE or NE; though this has probably more to do with the suitability of the shaft sides for nesting. Of the 20 nests monitored in 2014 just one, Spindle Thorn, had an aspect in the north-west quadrant. The nest was in deep heather on a steep bank on the east side of Loskey Beck at a location where there was also suitable habitat for nesting on the opposite side of the beck that had a predominantly easterly facing aspect.
The graph at Fig.1 5 for all nests in the Rosedale area clearly shows a strong bias to an easterly bearing, with the north-east quadrant being the predominant aspect. For reasons that can't be explained, the south-west quadrant seems to be equally as prominent as the north-east quadrant for second nests, Fig. 16 & 17, albeit the majority still tending to an easterly direction. However, what is clear from all three graphs is that few nests are built with an aspect in the north-west quadrant. Whether this is a deliberate move by Rosedale ring ouzels or not is uncertain and is an area of study that needs further work.

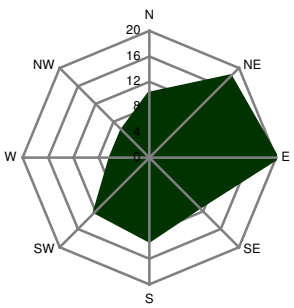


Figure 15: Nest aspect of all nests in the Rosedale area.
Data from Annex 4, Table 1. n=96.

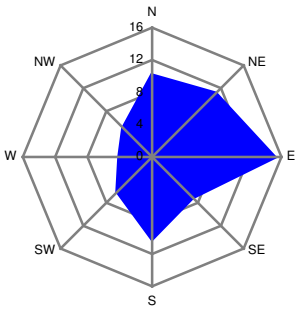


Figure 16: Nest aspect of first nests in the Rosedale area.
Data from Annex 4, Table 1. n=68

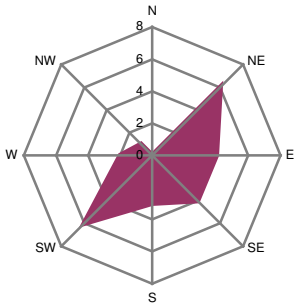


Figure 17: Nest aspect of second nests in the Rosedale area.
Data from Annex 4, Table 1. n=26

Note: In Figures 15 to 17 above the intercardinal points NNE, ENE etc. are not shown This has been done to smooth the graphs and remove the spikes that would be generated if all 16 points were displayed. For each of the eight intercardinal points shown in Annex 4, Table 1, the value (the number of nests with that aspect) is halved and apportioned to each adjacent cardinal point.

For example, if the number of nests having an intercardinal aspect of NNE was four, then two would be added to the N cardinal value and two to the NE cardinal value. If the ENE aspect had three nests then one would be added to NE and one to E. None of the intercardinal points recording just one nest are counted.

5.8 Passage Migrants

On **14th April** five ring ouzels, three male and two female, were seen foraging part way down the incline at Bank Top, Rosedale - one female looked to be a second year bird having a more pronounced gorget. This has been a well documented stopping off place over the years for Fennoscandian passage birds with 12 recorded in the same area in 2013.

Along the Yorkshire coast Spring migrants were recorded on **19th**, **28th** and **29th April**, while return migrants were seen throughout **October** on the **8th**, **10th**, **14th**,**15th**, **17th**, **19th** and **30th** - all sightings being single birds. On **5th November** a flock of 50+ were seen flying south low over Hunmanby Moor and a late sighting of a single bird on the **20th** was noted in the Filey area.

In the south-east of the country a large flock of 500+ Fennoscandian migrants was recorded on **14th October** passing through the Dungeness Bird Observatory. Smaller numbers were seen in west and east Sussex throughout the week between the **15th** and **20th October** with the usual stop-over places at Trueleigh Hill and Blackdown each recording 15 birds on the **18th** and **19th**.

5.9 Late Summer Activity

As in previous years a late season visit was made to Rosedale specifically to locate ring ouzels prior to migration. A walk around the head of the dale to Reeking Gill and a look at Blakey Swang bottom and Matty Carr quarry on **26th August** found no ring ouzels, despite the rowan trees having a good crop of berries. A pair of wheatears were seen foraging in the Swang bottom.

A second visit on **10th September** located a male in flight at Reeking Gill that landed on a rock below Reeking Gill quarry. It stayed for five minutes occasionally preening before flying off in a northerly direction and out of sight. Around the same time a juvenile flew out of a rowan tree just below the gill embankment and flew off in the same direction as the male chacking loudly as it departed.

The last Rosedale visit on **22nd September** to Dalehead and Reeking Gill found no ring ouzels.

A check on the BTO Birdtrack web site showed a single male at Blakey Ridge on **16th October** and two in Bransdale on **9th November**. Both sightings are likely to be Fennoscandian migrants taking a more westerly path than is usual for the return journey, the timing fitting well with the coastal sightings noted above.

6. ACKNOWLEDGEMENTS

The authors wish to acknowledge the support of Spaunton estate owner, George Winn-Darley, head-keeper George Thompson and under-keeper Anthony Orr. Also the head-keeper of the Rosedale estate, Jimmy Brough, and to Mick Carroll, Tom Denney, Jim Pewtress and Chris Tyas for reports of ring ouzel sightings during the 2014 season. Our grateful thanks to all of them.

7. REFERENCES

Appleyard, I. (1994) Ring Ouzels of the Yorkshire Dales.

Burfield, I.J. (2002) The Breeding Ecology and Conservation of the Ring Ouzel in Britain

ANNEX 1 - Map of Nest Sites and Territories in the Rosedale Area in 2014

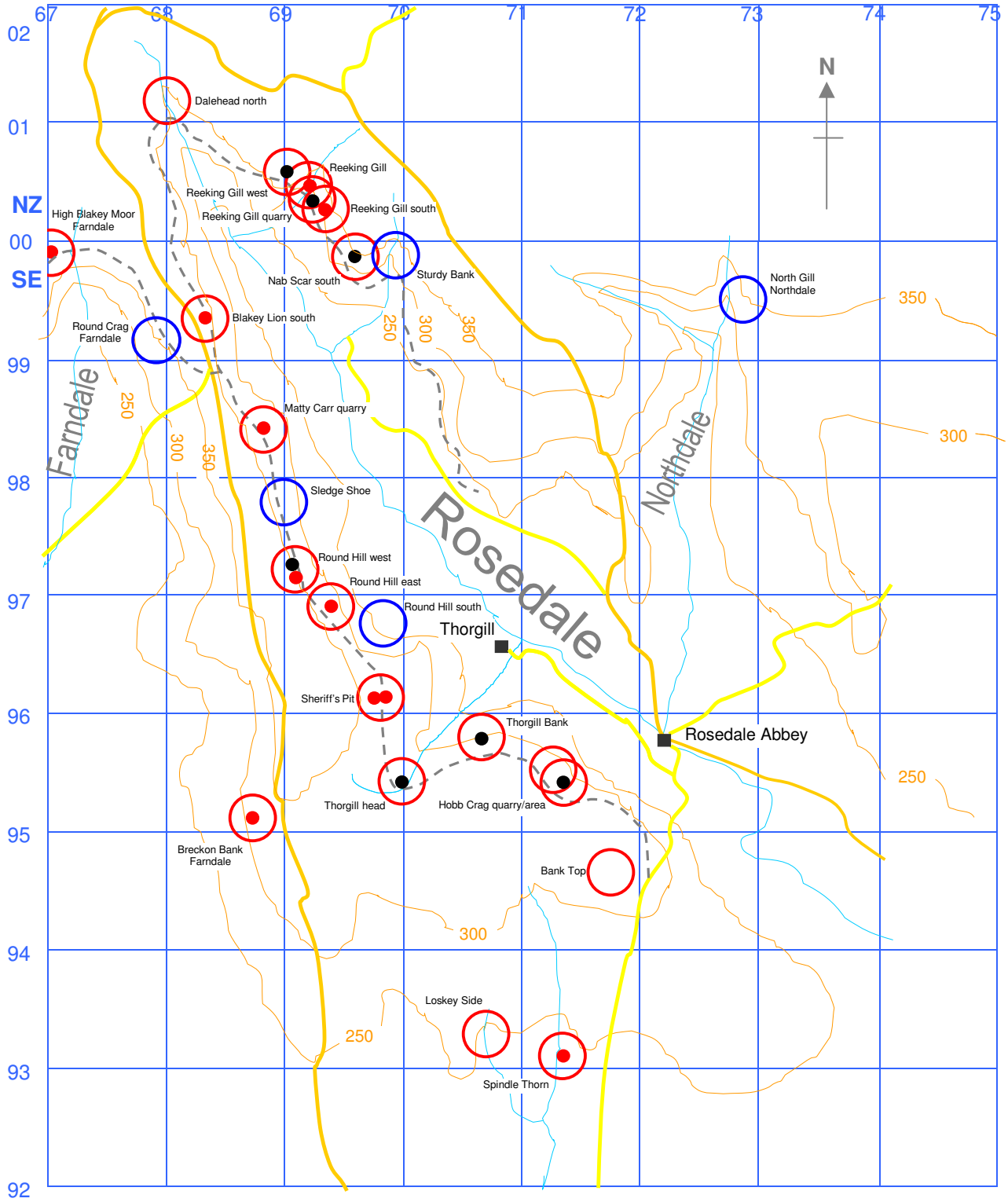


Diagram 1: Ring ouzel nest sites and territories where Confirmed or Probable breeding was recorded in the Rosedale area of the North York Moors in 2014.

● **Successful Nest.** ● **Predated Nest.** ○ **Territory where Confirmed breeding was recorded.** ○ **Territory where Probable breeding was recorded.**

ANNEX 2 - Map of Sightings on the North York Moors in 2014
(Other than the Rosedale area & passage migrants)

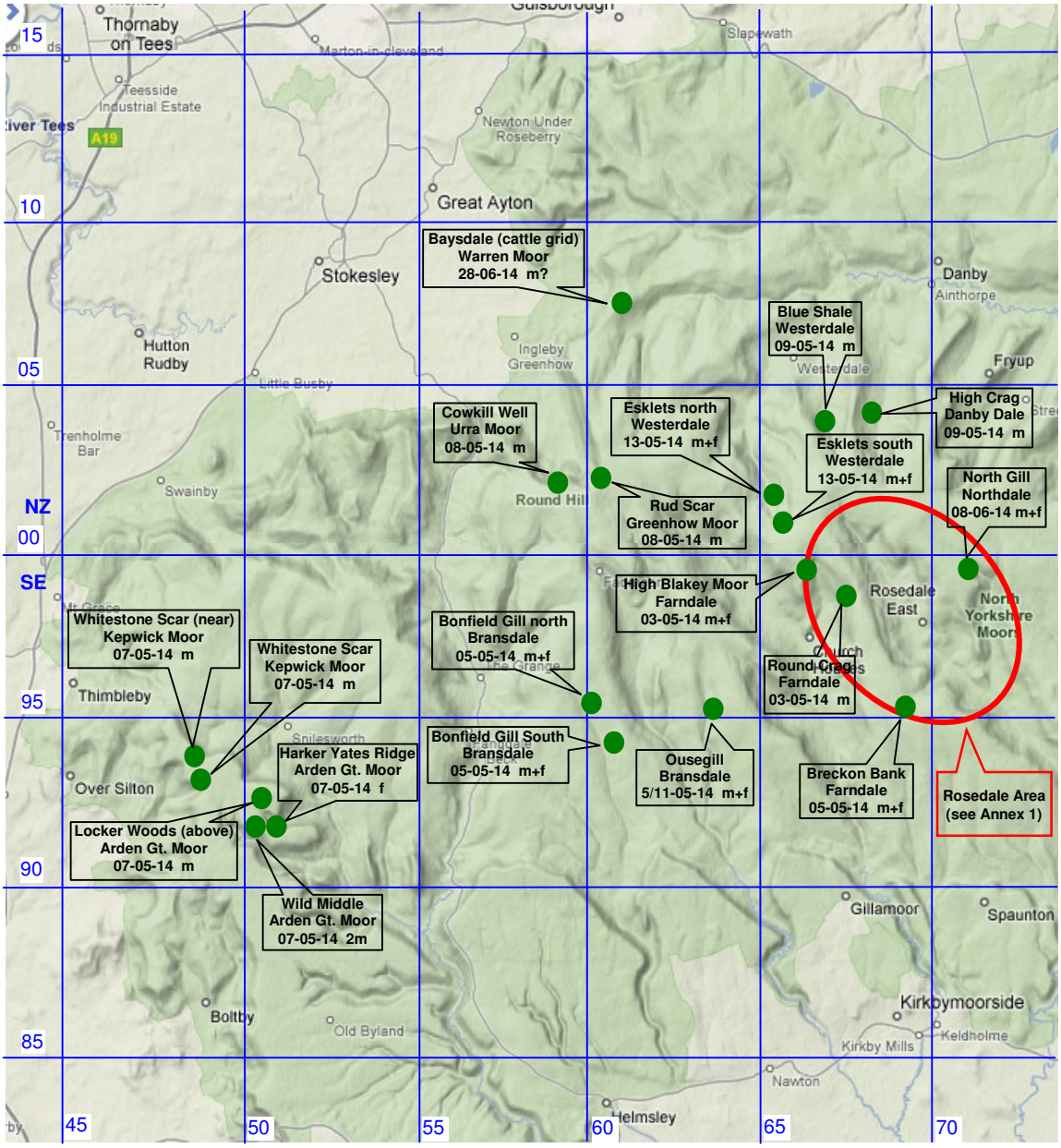


Diagram 2: Sightings of ring ouzels on the North York Moors in 2014 other than the Rosedale area and passage migrants.

ANNEX 3 - Table of Annual Breeding Results from 2000 to 2014

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 2014.

Year	Site	Grid Ref.	Eggs	Hatched	Fledged	Comments
2000	Spaunton Moor - Pen Wash	SE71479347	4	4	4	1st brood. 4 pulli ringed.
2002	Bank Top	SE72049483	(4)	4	4	Likely to be 2nd brood.
2003	Ouzegill Bdg.	SE63709450	4	4	4	1st brood. 4 pulli ringed.
2003	Round Hill	SE69279710	4	4	4	1st brood
2003	Thorgill Head	SE69999559	4	3	0	1st brood. Nest disturbed, chicks abandoned.
2003	Thorgill Bank	SE70729582	4	3	3	1st brood. 3 pulli ringed.
2003	Thorgill Bank	SE70729582	2	1	?	2nd brood. Likely to have failed at pulli stage.
2003	Spaunton Moor - Pen Wash	SE71489347	4	+	0	1st nest. Predated at pulli stage.
2003	Hob Crag	SE71459538	4	0	0	Likely to be 1st 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 1st brood.
2004	Dale Hd East	NZ68560086	4	4	4	Likely to be 2nd brood.
2004	Ouzegill Bdg.	SE63909470	2	1	?	1st brood. 1 egg vanished. 1 pulli ringed.
2005	Sheriff's Pit 1st	SE69659631	+	1	0	1st nest. Nest abandoned; reason unknown.
2005	Sheriff's Pit 2nd	SE69659631	+	0	0	2nd attempt. Predated at egg stage.
2005	Sheriff's Pit 3rd	SE69659631	+	3	2	3rd nest.
2005	Matty Carr quarry	SE68809835	4	4	4	Thought to be 1st brood.
2005	Lion Inn	SE68249954	(4)	4	4	Likely to be 2nd brood.
2005	Dale Hd West	NZ67960082	+	+	3	3 fledglings seen near nest.
2006	Sheriff's Pit 1st	SE69659631	4	0	0	Nest on NW side of pit shaft washed out by heavy rain in mid May.
2006	Sheriff's Pit 2nd	SE69779609	5	5	5	2nd attempt 185m south of pit shaft.
2006	Dale Hd West	NZ67930081	4	+	+	Likely to be 2nd brood. Not known if hatched or fledged.
2007	Hob Crag	SE71459538	3	0	0	1st nest. Predated at egg stage.
2007	Round Hill Sth	SE69819663	4	4	4	1st nest.
2007	Dale Hd West	NZ67940079	4	4	4	1st nest.
2007	Reeking Gill	NZ68920066	4	4	4	1st nest.
2008	Sturdy Bank 1st	SE69899991	4	4	4	1st nest.
2008	Sturdy Bank 2nd	SE69869990	4	4	3	2nd nest.
2008	Round Hill Sth	SE69819664	4	4	4	1st nest. Used refurbished 2007 nest.
2008	Reeking Gill	NZ69140056	5	5	5	1st nest.
2008	Northdale, West Gill	SE71799957	+	+	3	1st nest.
2008	Hobb Crag 1st	SE71449539	4	4	0	1st attempt. Predated at pulli stage. Used 2003/4 nest site.
2008	Hobb Crag 2nd	SE71399545	3	0	0	2nd attempt. Predated at egg stage.
2008	Sheriff's Pit	SE69719626	4	4	4	1st brood.
2008	Dalehead Nth.	NZ67950102	4	1	0	Likely to be 2nd attempt. Failed after 1st hatchling. 1egg left in nest.
2009	Dale Hd West	NZ67940079	4	4	4	1st nest.
2009	Sturdy Bank	SE6987 9991	4	4	3	Likely to be 1st nest.
2009	Round Hill Sth	SE69539674	4	4	4	1st nest.
2009	Reeking Gill	NZ69240076	+	+	3	1st nest.
2009	Sheriff's Pit	SE69729627	(5)	5	5	2nd nest. 1st nest at Round Hill Sth.
2010	Ouzegill 1	SE64009511	4	4	3	1st nest. 1 left early & died near nest.
2010	Ousegill 2	SE63989497	5	3	0	2nd nest 140m sth of 1st nest. Predated at pulli stage. 2 eggs left.
2010	Ousegill Bridge	SE63929444	5	0	0	Likely to be 2nd nest. Predated at egg stage.
2010	Sturdy Bank 1st	NZ69890000	3	3	3	1st nest.
2010	Sturdy Bank 2nd	NZ69870005	3	0	0	2nd nest. Predated at egg stage.
2010	Reeking Gill	NZ69080068	(4)	4	4	1st nest.
2010	Reeking Gill cut 1st	NZ68790066	4	4	4	1st nest.
2010	Reeking Gill cut 2nd	NZ68860068	(3)	3	3	2nd nest 69m east of first nest.
2010	Hob Crag 1st	SE71389544	(4)	4	4	1st nest.
2010	Hob Crag 2nd	SE71389544	(4)	4	2	2nd nest using same nest as 1st nest.
2010	Sheriff's Pit	SE69739627	+	3	3	1st nest.
2010	Round Hill (central)	SE69439690	(4)	4	4	1st nest.
2011	Hob Crag	SE71239557	(4)	4	4	1st nest.
2011	Round Hill east	SE69459685	(4)	4	4	1st nest.
2011	Round Hill west	SE69269706	4	4	4	1st nest.
2011	Matty Carr quarry	SE68809836	4	4	4	1st nest.
2011	Ousegill Bridge	SE63969475	4	0	0	1st nest. Likely to have been predated at egg stage.
2011	Sturdy Bank 1st	NZ69870005	3	3	3	1st nest.
2011	Sturdy Bank 2nd	SE69879994	4	3	0	2nd nest. Nest predated. 1 egg unsure if hatched.
2011	Nab Scar north 1st	SE69459996	4	4	4	1st nest.
2011	Nab Scar north 2nd	NZ69440000	4	3	3	2nd nest. One egg left in nest.
2011	Reeking Gill 1st	NZ69150072	4	+	+	1st nest. Fledged; assumed all 4 left nest.
2011	Reeking Gill 2nd	NZ69170071	5	5	5	2nd nest.
2011	Dalehead west 1st	NZ67930081	4	3	3	1st nest. One egg left in nest.
2011	Dalehead west 2nd	NZ67940079	4	3	3	2nd nest. One egg left in nest.
2011	Dalehead quarry west 1st	NZ68290085	4	4	4	1st nest.
2011	Dalehead quarry west 2nd	NZ68290085	4	+	0	2nd nest. Nest predated at chick stage.
2011	Dalehead east	NZ68650075	4	4	4	Likely to be 2nd nest.
2011	Dalehead north	NZ68050125	(4)	4	4	1st nest.
2011	Thorgill Bank	SE70669580	4	4	0	2nd nest. Likely to have been predated at chick stage.
2011	Sheriff's Pit	SE69739627	+	2	2	Likely to be 2nd nest.

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

Year	Site	Grid Ref.	Eggs	Hatched	Fledged	Comments
2012	Reeking Gill cutting	NZ68810067	4	4	4	1st nest.
2012	Nab Scar south	SE69499988	4	3	3	1st nest. 4 eggs laid, 1 removed.
2012	Sturdy Bank	SE69859996	4	-	-	1st nest. Nest abandoned at egg stage.
2012	Dalehead west	NZ67940080	4	-	-	1st nest. Nest abandoned at egg stage.
2012	Sheriff's Pit north	SE69689643	4	4	4	1st nest.
2012	Sheriff's Pit	SE69739627	+	+	2	2nd nest.
2012	Round Hill south	SE69449670	4	4	0	1st nest. Nest predated at chick stage.
2012	Reeking Gill	NZ69190066	4	4	4	1st nest.
2012	Blakey Lion	SE68239960	5	3	3	1st nest. 2 fledged 7/6 & 1 fledged 8/6.
2012	Matty Carr south	SE68889818	3	3	0	2nd nest. Nest predated at chick stage.
2012	Matty Carr quarry	SE68809835	(3)	3	0	Likely replacement 2nd nest from Matty Carr south pair.
2012	Round Hill west	SE69269706	4	4	3	Likely to be 2nd nest. One pulli died naturally in nest.
2012	Nab Scar north	NZ69430006	4	0	0	2nd nest. Nest predated at egg stage.
2012	Spaunton Knowl	SE71709180	+	3	?	1st nest. 3 naked pulli on 24/5. Outcome unknown.
2013	Reeking Gill cutting	NZ68870065	4	0	0	1st nest. 4 eggs 14/5. Found abandoned 19/5.
2013	Dalehead west	NZ67940079	4	3	3	1st nest. 1 hatched 13/5. 3 pulli 23/5. 1 egg left in nest.
2013	Reeking Gill 1.	NZ69240079	4	4	4	1st nest. 3 pulli 13/5. 4 pulli 21/5. Fledged.
2013	Reeking Gill 2.	NZ69500083	(3)	2	2	2nd 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	1st nest. 2 pulli at Day 6 on 22/5. 2 eggs unhatched.
2013	Reeking Gill south 2.	NZ69330045	(4)	4	4	2nd nest. 4 pulli on 21/6 at Day 2 stage. Fledged
2013	Hob Crag quarry 2nd	SE71389542	4	0	0	2nd nest first clutch. Predated at egg stage.
2013	Hob Crag quarry 3rd	SE71449539	4	3	2	3rd nest second clutch. 3 hatched 20/5. 2 pulli in nest on 1/6.
2013	Hob Crag quarry 4th	SE71379543	4	4	4	4th nest third clutch.
2013	Hob Crag north	SE71189566	3	3	0	Late 2nd nest. 3 eggs on 27/6. Hatched 4/7. Predated.
2013	Sheriff's Pit 1.	SE69729626	+	2	2	1st nest. Look to be 2 pulli. 2 fledglings seen near nest on 27/5.
2013	Sheriff's Pit 2.	SE69729626	+	3	3	2nd nest. Look to be 3 pulli at possibly at Day 8 stage on 24/6.
2013	Round Hill west	SE69259705	4	4	4	1st nest (late). 4 pulli seen in nest 10/6. Fledged 11/6.
2013	Round Hill south 1.	SE69689671	4	3	3	1st nest. Still in nest on 30/5. Likely fledged 31/5. 1 egg broken.
2013	Round Hill south 2.	SE69599670	4	4	3	2nd nest. 1 just hatched, 1hatching, on 1/7. 1 dead left in nest.
2013	Blakey Lion north	SE68049997	(4)	4	4	1st nest. Likely to have fledged after 12 days.
2014	Round Hill west	SE69269706	4	4	3	1st nest. 3 pulli seen on 12/5. Fledged 15/5.
2014	Round Hill west	SE69249709	4	4	0	2nd nest. 4 pulli seen at Day 6 on 19/6. Predated between D6 & 10.
2014	Round Hill east	SE69419681	4	4	4	1st nest. 1 egg 3 pulli just hatched on 12/5. 4 pulli 19/5 7 days old.
2014	Blakey Lion south	SE68269954	4	4	4	1st nest.
2014	Hob Crag quarry	SE71379543	4	4	0	1st nest. Predated at chick stage.
2014	Thorgill Bank quarry	SE70739582	3	+	0	1st nest. Predated at chick stage. 2 eggs 1 pullus just hatched 5/5.
2014	Thorgill Head	SE69909568	5	4	0	Replacement nest. Found predated 7/6 4 pull1 3 days 1 egg left.
2014	Matty Carr quarry	SE68809836	4	4	3	1st nest. 4 pulli 4 days old on 19/5. Likely fledged 28/5 at 12 days.
2014	Spindle Thorn	SE71319313	4	4	4	1st nest. 4 pulli seen at Day 11 on 20/5. Fledged 23/5 at 13 days.
2014	Sheriff's Pit	SE69799625	(4)	4	4	1st nest. 4 pulli 29/5 11 days. Nest empty & 2 dead near nest 31/5.
2014	Sheriff's Pit	SE69739628	(3)	3	3	2nd nest. 3 pulli on 30/6 at Day 8/9. Fledged 6/7.
2014	Reeking Gill west	NZ69030069	4	0	0	1st nest. 4 eggs on 30/4. Predated at egg stage.
2014	Reeking Gill quarry	NZ69170053	4	0	0	1st nest. 4 eggs on 30/4. Predated at egg stage.
2014	Reeking Gill south	NZ69280044	4	4	4	1st nest. 4 days old on 13/5. Fledged at 11 days.
2014	Reeking Gill	NZ69120066	4	(4)	3	2nd nest. 2 pulli just hatched & 2 eggs on 17/6. 3 pulli on 28/6.
2014	Nab Scar south	SE69529986	4	0	0	Replacement nest? F. sitting on 4 eggs on 21/5. Predated.
2014	Farndale - Breckon Bank	SE68699508	4	4	4	1st nest. 2 eggs & 2 pulli hatched 5/5. Fledged 18/5 at 13 days.
2014	Farndale - High Blakey Moor	SE66679945	4	4	4	1st nest. Fledged 22/5 at 12 days.
2014	Esklets -Esklets Crags south	NZ66250159	4	4	?	1st nest. 4 pulli on 15/5, 4 days old. Nest not checked after 15th.
2014	Esklets -Esklets Crags north	NZ65910236	4	4	?	1st nest. 4 pulli on 15/5, 4 days old. Nest not checked after 15th.

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

ANNEX 4 - Table of Nest Aspect and Elevation from 1999 to 2014

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

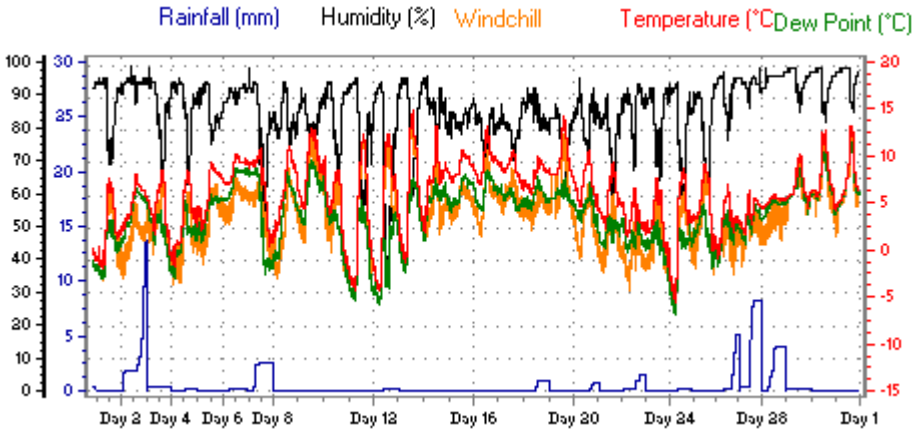
Year	Location	Grid Reference	Aspect	Elevation
1999	Rosedale - Sheriff's Pit	SE 6973 9627	NNW	331m
1999	Blakey Crossing	SE 6830 9900	SSW	370m
2000	Spaunton Moor - Penwash	SE 7147 9347	SSW	240m
2002	Rosedale - Bank Top	SE 7204 9483	NNW	310m
2003	Rosedale - Round Hill	SE 6927 9710	N	336m
2003	Rosedale - 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 1st	SE 7144 9539	NNE	310m
2008	Rosedale - Hob Crag 2nd	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 1st	SE 6989 9991	W	307m
2008	Rosedale - Sturdy Bank 2nd	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 (1st & 2nd)	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 1st	NZ 6879 0066	S	328m
2010	Rosedale - Reeking Gill cutting 2nd	NZ 6886 0068	SE	329m
2010	Rosedale - Dalehead (quarry west)	NZ 6828 0082	S	281m
2010	Bransdale - Ousegill 1st	SE 6400 9511	W	250m
2010	Bransdale - Ousegill 2nd	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) 1st	NZ 6793 0081	SW	352m
2011	Rosedale - Dalehead (west) 2nd	NZ 6794 0080	SW	347m
2011	Rosedale - Dalehead (east)	NZ 6865 0076	NE	328m
2011	Rosedale - Dalehead quarry (west) 1st & 2nd	NZ 6830 0085	E	296m
2011	Rosedale - Reeking Gill 1st	NZ 6915 0072	S	333m
2011	Rosedale - Reeking Gill 2nd	NZ 6917 0071	S	319m
2011	Rosedale - Nab Scar north 1st	SE 6945 9996	SW	337m
2011	Rosedale - Nab Scar north 2nd	NZ 6944 0000	SW	339m
2011	Rosedale - Sturdy Bank 1st	NZ 6987 0005	E	343m
2011	Rosedale - Sturdy Bank 2nd	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 1st (abandoned)	SE 7137 9543	-	-
2013	Rosedale - Hob Crag quarry 2nd (predated)	SE 7138 9542	NW	305m
2013	Rosedale - Hob Crag quarry 3rd 1st fledged	SE 7144 9539	N	295m
2013	Rosedale - Hob Crag quarry 4th 2nd 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 1st & 2nd	SE 6972 9626	SE	343m
2013	Rosedale - Round Hill south 1st	SE 6968 9671	NNE	279m
2013	Rosedale - Round Hill south 2nd	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 1st	NZ 6924 0079	SE	370m
2013	Rosedale - Reeking Gill 2nd	NZ 6950 0083	SSE	392m
2013	Rosedale - Reeking Gill south 1st	NZ 6929 0043	WSW	358m
2013	Rosedale - Reeking Gill south 2nd	NZ 6933 0045	WSW	367m
2014	Rosedale west - Round Hill west 1st	SE69269706	NE	350m
2014	Rosedale west - Round Hill west 2nd	SE69249709	E	351m
2014	Rosedale west - Round Hill east	SE69419681	NE	339m
2014	Rosedale west - Blakey Lion south	SE68269954	E	369m
2014	Rosedale west - Hob Crag quarry	SE71379543	NE	304m
2014	Rosedale west - Thorgill Bank	SE70739582	E	308m
2014	Rosedale west - Thorgill Head	SE69909568	WSW	331m
2014	Rosedale west - Matty Carr quarry	SE68809836	W	327m
2014	Rosedale west - Spindle Thorn	SE71319313	NW	218m
2014	Rosedale west - Sheriff's Pit 1st	SE69809625	E	337m
2014	Rosedale west - Sheriff's Pit 2nd	SE69739627	NNE	340m (gnd levl 343m)
2014	Rosedale east - Reeking Gill west	NZ69030069	S	318m
2014	Rosedale east - Reeking Gill quarry	NZ69170053	S	310m
2014	Rosedale east - Reeking Gill south	NZ69280044	WSW	358m
2014	Rosedale east - Reeking Gill	NZ69120066	SW	307m
2014	Rosedale east - Nab Scar south	SE69529986	SSW	332m
2014	Farndale east - Breckon Bank	SE68699508	SSW	315m
2014	Farndale east - High Blakey Moor	SE66679945	SSE	373m
2014	Esklets east - Esklets Crags south	NZ66250159	SW	309m
2014	Esklets east - Esklets Crags north	NZ65910236	SW	287m

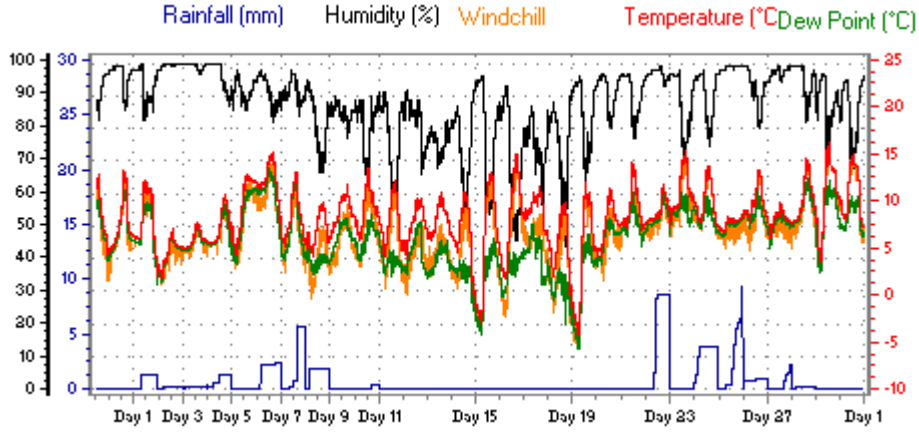
ANNEX 5 - Table of Late:Early Territory Occupancy from 2008 to 2014

Territory	Occupancy													
	2008		2009		2010		2011		2012		2013		2014	
	Early	Late	Early	Late	Early	Late	Early	Late	Early	Late	Early	Late	Early	Late
Spindle Thorn		✓							✓			✓	✓	
Bank Top							✓		✓		✓		✓	
Hob Crag quarry	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓✓	✓
Hob Crag north										✓	✓	✓		
Thorgill Bank quarry							✓	✓	✓		✓	✓	✓	
Thorgill Head													✓	
Sheriff's Pit	✓			✓	✓			✓	✓	✓	✓	✓	✓	✓
Round Hill south	✓	✓	✓						✓		✓	✓	✓	
Round Hill east	✓	✓	✓	✓	✓		✓		✓				✓	
Round Hill west							✓		✓	✓	✓		✓	✓
Sledge Shoe			✓							✓	✓	✓	✓	
Matty Carr south										✓				
Matty Carr quarry	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Blakey Lion south									✓		✓		✓	
Blakey Lion north											✓			
Blakey Swang north	✓													
Dalehead west			✓				✓	✓	✓		✓			
Dalehead north	✓	✓			✓		✓			✓			✓	
Dalehead east								✓						
Dalehead quarry east					✓	✓					✓			
Dalehead quarry west						✓	✓	✓	✓					
Reeking Gill cutting	✓				✓	✓			✓		✓			
Reeking Gill west													✓	
Reeking Gill	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓		✓
Reeking Gill quarry	✓											✓	✓	
Reeking Gill south							✓				✓	✓	✓	✓
Nab Scar north			✓		✓	✓	✓	✓		✓	✓	✓		✓
Nab Scar south					✓				✓				✓	
Sturdy Bank	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	
Total	11	6	8	5	11	7	13	10	16	9	18	12	19	7
Occupancy	0.54		0.62		0.64		0.77		0.56		0.67		0.37	

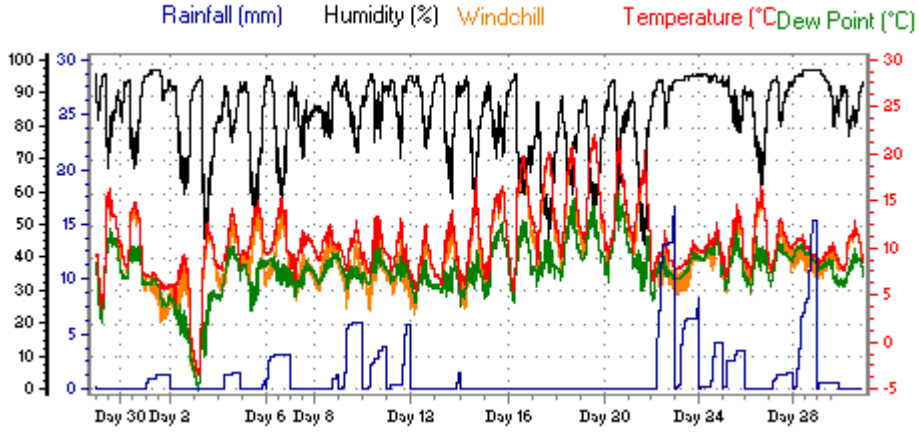
ANNEX 6 - Graphs of Daily Max/Min Temperature & Rainfall for the Months March to July



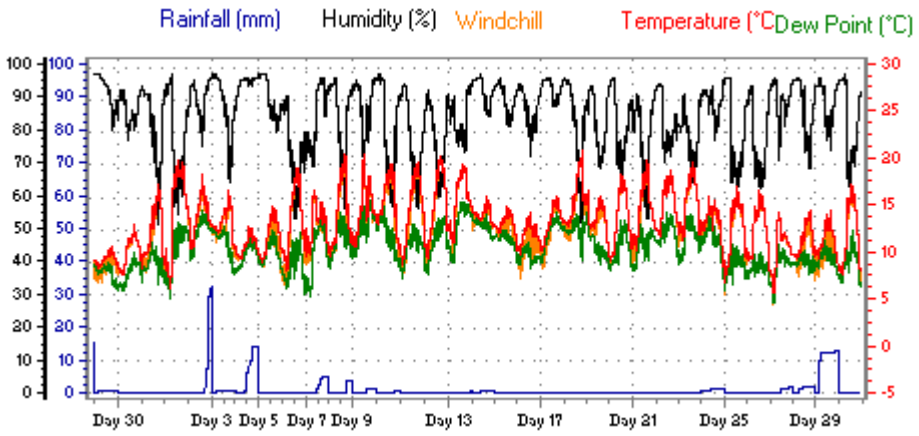
March



April

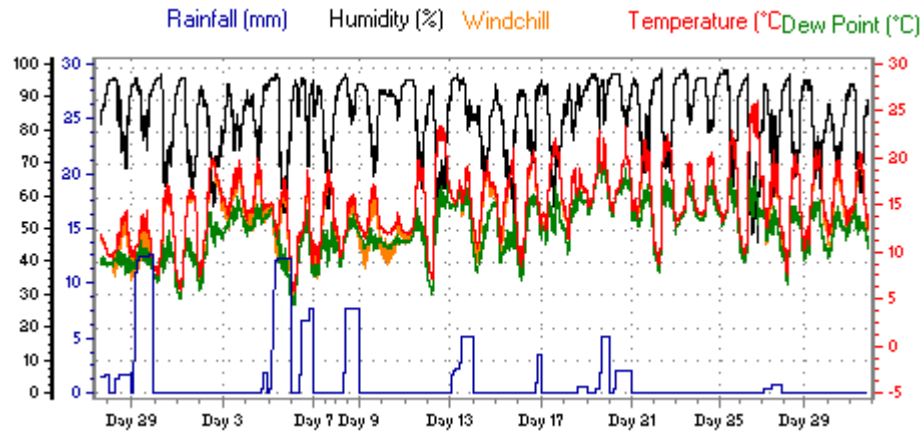


May



June

July



Daily max/min temperature & rainfall recorded at Westerdale, NZ665058, altitude 180m, in 2014.