RING OUZEL REPORT 2018

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

20th Year of the Rosedale Study

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Front-page photo: Hob Crag, Rosedale, male Ring Ouzel showing yellow ring, 5 May 2018 – Vic Fairbrother.

1. SUMMARY OF 2018 RING OUZEL REPORT

1. **First arrival at Nab Scar on 24th March; 2 days later than 2017** (5.2, Pg. 16)

2. **11 territories recorded in 2018; down a third from 2017 & well below 2012 peak of 23** (5.3, Pg. 16)

3. **Mean of 3 fledged young for each laying pair in 2018; slightly below average** (5.4, Pg. 26)

4. **Productivity below long-term average in 6 of the last 7 years** (5.4, Pg. 26)

5. **Just over half (54%) of breeding pairs had a late nest; equal to long-term average** (5.5, Pg. 27)

2. INTRODUCTION

The 2018 survey was the 19th year in which a detailed study had been made of the Ring Ouzel *Turdus torquatus* (RZ) population in the North York Moors National Park; only the foot and mouth outbreak in 2001 and the subsequent closure of the moors, preventing what would have been 20 years of continuous study since the start of the project in 1999.

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.

As in previous years the 2018 survey concentrated mainly on recording Ring Ouzel activity in the Rosedale area of the North York Moors; an area of around 25 square kilometres. Reports of Ring Ouzel sightings in other parts of the National Park have been included with their approximate location shown on a map of the area. Sightings of birds that are considered to be passage migrants that appear annually across the Moors and along the coast have been excluded from the map.

A topographical map of the Rosedale area has been included for the first time. This shows the approximate location and name of the 40 or so territories referred to in the report.

Finally, as in previous years, the north-west and east side of Rosedale was surveyed by Vic Fairbrother and the west side south to Spaunton moor by Ken Hutchinson.

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: Confirmed and Probable Ring Ouzel territories in the Rosedale area between 1999 and 2018

	Location (All territories recorded)	NGR	Year																	
			99	00	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
1.	Spaunton Moor - Spindle Thorn	SE 716 930	?	×	✓	×	×	×	×	×	✓	×	×	?	✓	✓	×	×	✓	✓	×
2.	Spaunton Moor - Spaunton Knowl	SE 717 918	?	?	?	?	?	?	?	?	?	?	?	?	✓	×	×	×	×	×	×
3.	Spaunton Moor - Loskey Side (ford)	SE 708 933	?	?	?	?	?	?	?	?	?	?	?	?	?	×	✓	×	×	✓	×
4.	Spaunton Moor - Loskey Beck (ford)	SE 714 934	?	✓	✓	✓	×	×	✓	×	×	×	×	?	×	×	×	×	×	×	×
5.	Spaunton Moor - Loskey Beck east	SE 715 935	?	×	×	✓	✓	✓	×	×	×	×	×	?	×	×	×	×	×	×	×
6.	Spaunton Moor - Loskey Beck south	SE 713 931	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓	✓	×	✓	×
7.	Rosedale west - Bank Top	SE 720 951	✓	✓	✓	✓	×	×	✓	×	×	×	×	✓	✓	✓	✓	✓	✓	✓	✓
8.	Rosedale west - Bank Top east	SE 725 945	?	×	×	✓	×	✓	×	×	×	×	×	×	×	×	×	✓	×	×	×
9.	Rosedale west - Hob Crag quarry	SE 714 954	?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ ✓	✓	✓	✓	✓
10.	Rosedale west - Hob Crag north	SE 712 956	×	×	×	×	×	×	×	×	×	×	×	✓	×	✓	×	✓	×	✓	×
11.	Rosedale west - Hob Crag west	SE 711 953	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓	×
12.	Rosedale west - Thorgill Bank quarry	SE 707 958	?	×	×	✓	×	×	✓	×	×	×	×	×	✓	✓	✓	✓	✓	×	✓
13.	Rosedale west - Thorgill Bank west	SE 705 957	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓	✓	✓	✓
14.	Rosedale west - Thorgill Bank east	SE 711 958	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓	×
15.	Rosedale west - Thorgill Head	SE 670 956	?	×	✓	✓	✓	✓	×	×	×	×	×	×	×	×	✓	×	×	×	×
16.	Rosedale west - Sheriff's Pit	SE 697 963	✓	✓	✓	×	✓	✓	✓	×	✓	✓	✓	✓	×	✓	✓	✓	✓	×	✓
17.	Rosedale west - Sheriff's Pit north	SE 697 964	×	×	×	×	×	×	×	×	×	×	×	×	✓	×	×	×	×	✓	×
18.	Rosedale west - Sheriff's Pit south	SE 698 961	×	×	×	×	×	×	✓	×	×	×	×	×	×	×	×	×	×	×	×
19.	Rosedale west - Round Hill south	SE 694 968	?	×	✓	✓	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	×	✓	✓	×
20.	Rosedale west - Round Hill west	SE 693 971	×	×	✓	×	×	×	×	×	×	×	×	✓	✓	✓	✓	✓	✓	✓	✓
21.	Rosedale west - Round Hill north	SE 693 974	?	×	×	×	×	×	×	✓	×	×	×	×	×	×	×	×	×	×	×
22.	Rosedale west - Round Hill east	SE 694 970	?	×	✓	✓	✓	×	×	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	×	✓
23.	Rosedale west - Sledge Shoe Bents	SE 691 978	?	✓	✓	✓	✓	✓	✓	×	×	✓	×	✓	✓	✓	✓	✓	✓	✓	✓
24.	Rosedale west - Matty Carr quarry	SE 688 984	?	×	×	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	×	✓	×	×
25.	Rosedale west - Matty Carr south	SE 690 980	?	×	×	×	×	✓	×	✓	×	×	×	×	✓	×	×	✓	×	×	✓
26.	Rosedale west - Matty Carr west	SE 687 983	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓	×
27.	Rosedale west - Lion Inn north	SE 680 999	×	×	×	×	×	×	×	×	×	×	×	×	×	✓	×	×	×	×	×
28.	Rosedale west - Lion Inn south	SE 681 999	×	✓	✓	✓	×	✓	×	✓	×	×	×	×	✓	✓	✓	✓	×	×	×
29.	Rosedale west - Blakey Swang	SE 685 998	?	?	?	?	?	?	?	?	✓	×	×	×	×	×	×	×	×	×	×
30.	Rosedale west - Dalehead north	NZ 680 013	✓	×	✓	×	✓	×	×	×	✓	×	✓	✓	✓	×	✓	×	×	×	×
31.	Rosedale west - Dalehead west	NZ 680 008	×	×	✓	✓	✓	✓	✓	✓	×	✓	×	✓	✓	✓	×	×	✓	×	×
32.	Rosedale east - Dalehead east	NZ 686 008	×	×	×	✓	✓	×	×	×	×	×	×	✓	×	×	×	×	×	✓	×
33.	Rosedale west - Dalehead south	NZ 682 005	×	×	✓	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
34.	Rosedale east - Dalehead quarry east	NZ 685 006	×	×	×	×	×	×	×	×	×	×	✓	×	×	×	×	×	✓	×	✓
35.	Rosedale east - Dalehead quarry west	NZ 683 008	×	×	×	×	×	×	×	×	×	×	✓	✓	✓	✓	×	✓	×	×	×
36.	Rosedale east - Reeking Gill cutting	NZ 689 007	×	×	×	×	×	×	×	✓	✓	×	✓	×	✓	✓	×	×	×	×	✓
37.	Rosedale east - Reeking Gill west	NZ 690 007	×	×	×	×	×	×	×	×	×	×	×	×	×	×	✓	×	×	×	×
38.	Rosedale east - Reeking Gill	NZ 691 007	✓	✓	✓	×	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	×
39.	Rosedale east - Reeking Gill quarry	NZ 692 005	×	×	×	×	×	×	×	×	×	×	×	×	×	✓	✓	×	×	×	×
40.	Rosedale east - Reeking Gill south	NZ 692 003	×	×	×	×	×	×	×	×	×	×	×	✓	✓	✓	✓	×	×	×	×
41.	Rosedale east - Nab Scar north	NZ 694 000	×	✓	×	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	×	✓	×	×	×
42.	Rosedale east - Nab Scar south	SE 695 999	×	×	×	×	×	×	×	×	×	×	✓	×	✓	×	✓	×	×	×	×
43.	Rosedale east - Sturdy Bank	SE 698 999	✓	✓	✓	✓	×	×	×	×	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	×
44.	Rosedale east - East Mine	SE 705 989	?	?	?	?	?	?	?	?	✓	×	×	×	✓	×	×	×	×	×	×
	TOTAL		**5**	**9**	**16**	**16**	**12**	**13**	**12**	**11**	**12**	**9**	**12**	**16**	**23**	**20**	**21**	**17**	**13**	**17**	**11**

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

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 2018 - other than the Rosedale area and passage migrants.

4.2 Nest Sites

Table 2: Summary of Ring Ouzel nest sites monitored in 2018.

No.	Location	Grid Ref.	Outcome	Comment
1.	Rosedale west - Round Hill west	SE69249707	2 Fledged	1st nest (early).
2.	Rosedale west - Round Hill west	SE69289705	3 Fledged	2nd nest (late).
3.	Rosedale west - Round Hill east	SE69449672	Likely predated	1st nest (early).
4.	Rosedale east - Reeking Gill cutting	NZ68860067	4 Fledged	1st nest (early).
5.	Bransdale - Ousegill	SE63979470	3 Fledged	2nd nest (late).

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 2018. (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 successfully 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	15 (5)	12 (1)[3]	10 (2)	5	40	3.64	2.86
15	13	9[h]	12 (3)	9 (2) [1]	8 (3)	4	27	3.00	2.25
16	6	9[h]	9 (3)	9 [3]	8 (3)	1	23	2.56	2.55
17	12	9[h]	10 (5)	9 (1) [3]	8 (3)	2	30	3.33	3.00
18	5	4	4 (2)	4 [2]	3 (3)	1	12	3.00	3.00
							Overall Mean	**3.58[i]**	**3.11**

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. Also includes nests that were not located but where recently fledged young were seen or where adults were seen feeding hidden young
i. Mean: 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 i. 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 four pairs were located and monitored in 2018, noticeably down on previous years reflecting the lower number of pairs recorded this year. The Round Hill west pair had an early and late nest in the cutting, the late nest being on the east side of the cutting the first time that the east side had been used over the years of the study. The five nests that were monitored have been used to determine annual productivity.

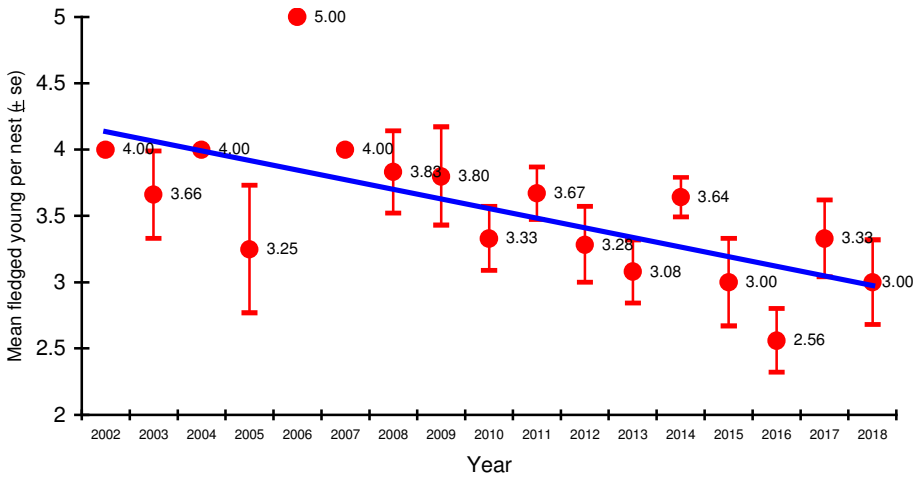

Figure 1: Annual mean fledged young per successful nest for Rosedale and other areas of the North York Moors between 2002 and 2018 showing 17-year trend.

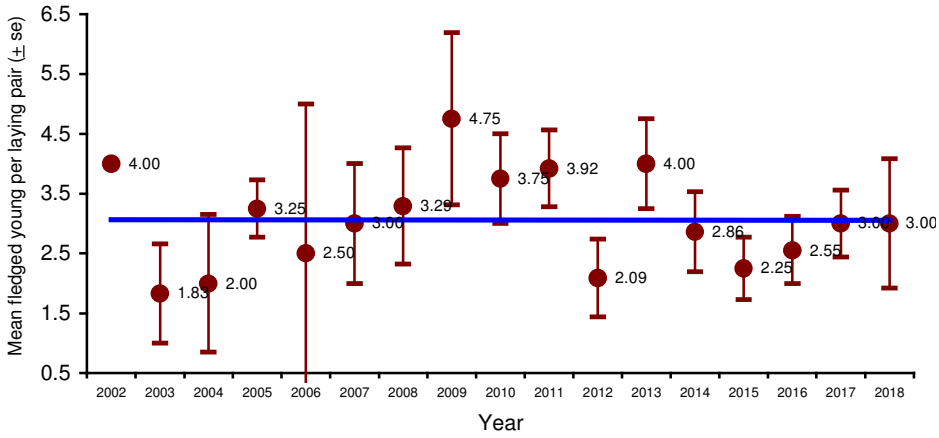

Figure 2: Annual mean fledged young per laying pair for Rosedale and other areas of the North York Moors between 2002 and 2018 showing 17-year trend.

4.4 First-egg Laying Dates

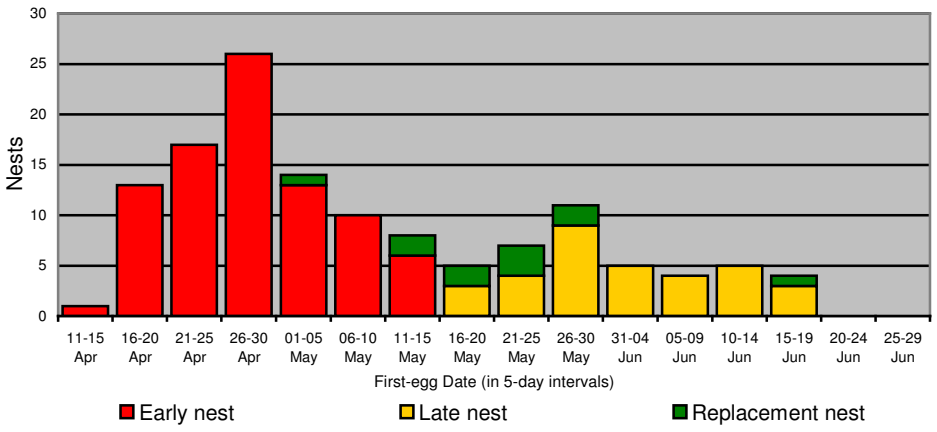

Figure 3: First-egg laying dates for Rosedale and other areas of the North York Moors between 2000 and 2018. Date points in 5-day intervals from April to June. (n=130)

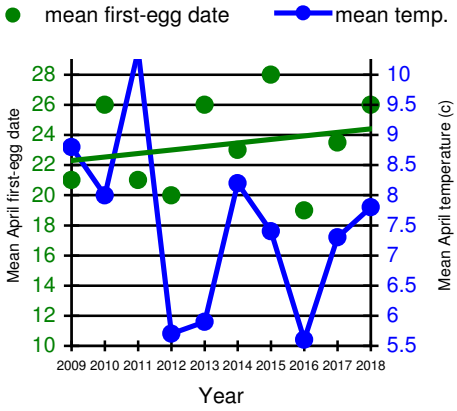

Figure 4: Mean April first-egg date and temperature for the North York Moors for the period 2009 to 2018 showing first-egg date 10-year trend (weather data from Fig. 6)

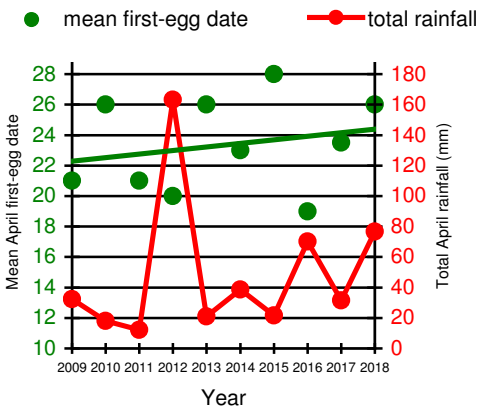

Figure 5: Mean April first-egg date and total April rainfall for the North York Moors for the period 2009 to 2018 showing first-egg date 10-year trend (weather data from Fig. 6)

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 west 1st	28 April	13 May	27 May (a)	1st nest.
	Dalehead quarry west 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	(p)	-	-	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 (p)	-	-	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) (p)	-	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	(p)	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 (p)	-	1st nest. 4 pulli at Day 2 on 5/5. Found predated on 12/5.
	Thorgill Bank quarry	19 April	5 May (p)	-	1st nest. 2 eggs 1 pullus just hatched 5/5. Found predated on 12/5.
	Thorgill Head	14 May	29 May (p)	-	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	(p)	-	-	1st nest. 4 eggs on 30/4. Found predated at egg stage.
	Reeking Gill quarry	(p)	-	-	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 (p)	-	-	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.

Year	Nest location	1st Egg	Hatching	Fledging	Comments
2015	Blakey Lion south	(p)	(p)	(p)	1st nest. 3 eggs. Found predated 27/4.
	Round Hill east	26 April (a)	12 May (p)	-	1st nest. 4 eggs. 3 newly hatched & 1 egg on 12/5. Found predated 20/5.
	Round Hill west	-	-	25 May	1st nest. Adults feeding chicks in nest 22/5. Juveniles seen near nest 26/5.
	Hob Crag quarry	(p)	-	-	1st nest. 4 eggs. Found predated 20/5.
	Hob Crag north	(p)	-	-	1st nest. 4 eggs. Found predated 20/5.
	Thorgill Bank quarry	8 May (a) (p)	-	-	1st nest. 4 eggs. 1 egg 8/5, 4 eggs 12/5. Found predated 22/5.
	Thorgill Bank west	20 May	6 June	19 June (a)	Replacement nest for Thorgill Bank quarry pair. 4 pulli ringed 14/6.
	Sheriff's Pit	29 April	14 May	27 May	1st nest. 3 pulli close to fledging 26/5.
	Reeking Gill	29 April	14 May	26 May	1st nest. 4 eggs on 11/5. 1 pullus & no eggs on 20/5. 1 pullus ringed 22/5.
	Reeking Gill	31 May	15 June (a)	29 June	2nd nest. 4 eggs on 9/6. 1 pullus just hatched & 3 eggs. 4 pulli ringed 23/6.
	Nab Scar north	30 April	15 May	27 May	1st nest. 3 eggs on 11/5. 2 pulli & no egg on 20/5. 2 pulli ringed 22/5.
	Bank Top	28 April (a)	12 May (p)	-	1st nest. 4 eggs. Found predated 20/5.
	Bank Top	23 May	7 June	19 June (a)	Replacement nest. Found 16/6, 3 pulli 9 days old. 3 pulli ringed 17/6.
	Spindle Thorn	11 May	26 May	8 June	1st nest. 4 eggs. 4 newly hatched pulli 26/5. 4 pulli ringed 2/6.
	Bank Top east	6 May	21 May	4 June	1st nest. Adults feeding fledglings 9/6 & 16/6. Likely 5 days out of nest on 9/6.
2016	Bank Top	(p)	-	-	1st nest. 4 eggs 22/4. Found predated 1/5.
	Thorgill Bank quarry	8 May	23 May	3 June	1st nest. 4 eggs 10/5, 13/5, 17/5. 1 pullus ringed 29/5.
	Sheriff's Pit	22 April	7 May	20 May	1st nest. 3 pulli seen 17/5.
	Sheriff's Pit	31 May	15 June	28 June	2nd nest. 3 pulli seen 21/6, 24/6.
	Round Hill east	15 April	30 April (p)	-	1st nest.4 pulli seen 3/5 estimated 3 days old. Found predated 8/5.
	Matty Carr quarry	(p)	-	-	1st nest. 4 eggs 6/5, 8/5. Found predated 13/5.
2017	Sturdy Bank	25 April (p)	-	-	1st nest. 2 eggs 26/4. Found predated 29/4.
	Hob Crag north	30 April	15 May	27 May	1st nest. 4 eggs 2/5. 4 pulli 16/5 est. 1 day old.
	Sheriff's Pit north 1	20 April	5 May (p)	-	1st nest. 4 pulli seen 6/5 estimated 1 day old. Found predated 13/5.
	Sheriff's Pit north 2	27 May	11 June	23 June	Replacement nest. 4 pulli 20/6 est. 9 days old.
	Thorgill Bank east	2 May	17 May	30 May	1st nest. 4 eggs 9/5. 4 pulli 23/5 est. 6 days old.
	Matty Carr west	21 April	6 May	18 May (a)	1st nest. 4 pulli 13/5 est. 8 days old. Fledged: 2 on 18/5 & 2 on 19/5.
	Loskey Side	12 June	27 June	9 July (a)	2nd nest. 4 eggs 19/6 & 21/6. 4 pulli 29/6 est. 2 days old.
	Round Hill west	19 June	4 July	17 July	2nd nest. 3 eggs 24/6. 1 pullus & 2 eggs 4/7. 2 pulli on 14/7.
	Dalehead west	29 April	14 May	27 May	1st nest. 3 pulli 22/5 est. 8 days old. Food taken to nest 26/5. Nest empty 30/5.
	Reeking Gill	20 May	5 June	-	Likely replacement nest. 5 eggs 3/6. 5 pulli 7/6 est. 2 days old. Found dead 9/6
	Hob Crag west	20 June	-	-	2nd nest. 4 eggs. Found nest destroyed on 27/6 with eggs crushed.
	Farndale east – High Blakey	26 April	11 May	24 May	1st nest. 4 eggs seen 1/5. 2 pulli est. 9 days old seen on 20/5.
2018	Round Hill east	25 April	10 May (p)	-	1st nest. 4 eggs on 3/5. 2 day old pulli & 2 eggs on 10/5. 3 pulli 8 days old colour ringed on 18/5. Nest found empty 24/5, most likely to have been predated.
	Round Hill west 1	27 April	12 May	24 May	1st nest. 4 eggs on 10/5. 3 four-day old pulli & 1 egg on 16/5. 2 pulli 6 days old colour ringed on 18/5. Likely fledged at 12 days.
	Round Hill west 2	5 June	20 June (a)	2 July (a)	2nd nest. 3 one-day old pulli & 1 egg on 21/6. 4 pulli 7 days old colour ringed on 27/6. 4 pulli in nest on 28/6. 3 fledged 2/7 at 12 days. 1 found dead just behind nest, likely died day after ringing.
	Reeking Gill cutting	4 May	19 May (a)	3 July	1st nest. 4 eggs on 10/5. 3 newly hatched pulli & 1 egg on 19/5. 4 pulli 5 days old on 24/5. 4 pulli 7 days old colour ringed on 27/5.
	Bransdale - Ousegill	27 May	11 June	24 June	2nd nest. 4 eggs on 10/6. 3 two-day old pulli on 13/6. 3 pulli 10 days old on 21/6.

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

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 female's distinct white head marking easily identified the pair. Studies by Appleyard in the Yorkshire Dales record a mean distance between first, second (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 **92** metres and **62** metres respectively (n=30).

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	Predated & 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	
2015	Bank Top	SE7179594969	SE7055395721	172	1st predated, 2nd fledged.
2015	Reeking Gill	NZ6924500793	NZ6913500649	181	1st & 2nd fledged.
2015	Thorgill Bank quarry/west	SE7074195824	SE7055395721	215	1st predated, 2nd fledged.
2016	Sheriff's Pit	SE6973096260	SE6971996260	3	1st & 2nd fledged nests.
2017	Sheriff's Pit north	SE6966596455	SE6970596425	57	1st predated, 2nd fledged.
2018	Round Hill west	SE6924297066	SE6928397050	44	
			Mean Distance	**92.2**	**metres**
			Median Distance	**62.0**	**metres**

5. DISCUSSION

5.1 Climate

5.1.1 Local Weather Observations

March The dominant feature of the March weather was the so-called "Beast from the East". This was the name given by the Met Office to a blast of cold easterly air that brought snow and sub-zero temperatures to most parts of the country on three separate occasions throughout the month. The first event saw some 20cm of snowfall over the higher grounds of the Moors on the last day of February that lasted until the fourth of March. Further occurrences on 16th and 28th of the month saw cold easterlies return with temperatures struggling to get above freezing by day. These events saw winds gusting up to 45mph making for temperatures that felt more like the Arctic. By the last two days of the month the wind eased and moved round to the west, bringing unsettled wet conditions and over 20cm of rainfall on the night of the 31st.

April The start of the month continued unsettled with over 24mm of rain falling on the 1st and for a good part of the following day. Winds during this period were strong and gusty, though daytime temperatures were into double figures with no frost at night. Towards the middle of the month a strong easterly airflow brought fog to inland locations making visibility poor. This persisted from the 10th to the 13th before a change of wind direction brought milder air from the south. By the 18th daytime temperatures across the moors started to climb to the high teens and by the 19th records were being broken across much of the UK with mid-day temperatures recorded at the Westerdale weather station reaching 23c. Overnight temperatures during this period remained in double figures. Rainfall recorded at Westerdale during the first half of the month exceeded 70mm, though drier conditions returned towards the end of the month. Temperatures dropped sharply in the later part of the month with daytime highs struggling to reach double figures and overnight temperatures dropping close to freezing. By the last day a strong gusty northerly airflow had set in making for cold conditions.

May After an unsettled start to the month, temperatures started to climb with day-time highs in the low twenties. Records across the UK were broken with the May Bank Holiday weekend of the 5/6th being the hottest on record. The 8th saw the end of the hot spell with temperatures returning to a more seasonal norm in the low to mid teens. Little rain occurred during the first half of the month. The dry conditions continued through the second half with the *Extreme Fire Risk* notices put out on the moorland roads in the last week of the month. Day-time temperatures by the end of the month climbed into the low twenties with night-time values staying in double figures. A feature of May was the strong gusty winds that occurred through throughout most of the month. Gusts recorded at Westerdale in the early part of the month exceeded 40mph, while gusts of up to 20mph were recorded on several days throughout the month. On the closing day of the month the temperature topped 24c. Across the UK it was the warmest May since records began.

June Saw more settled conditions with little rainfall. The gusty conditions recorded in May continued on and off throughout the month with peaks in excess of 40mph recorded over-night on the 13/14th. Temperatures fluctuated markedly throughout the month with highs on some days exceeding 20c while on others they struggled to reach 12c. By the last week a high-pressure system had established itself over the British Isles bringing hot conditions with temperatures locally reaching the mid-twenties by day. By the end of the month the Extreme Fire Risk signs had been put out again, reflecting the dry parched conditions that had resulted from a long absence of any significant rainfall.

July The hot dry conditions continued throughout July with mid day temperatures most days exceeding 20c, although slightly cooler conditions returned briefly during the second week. By the middle of the month less than 15mm of rainfall had been recorded over the past 45 days, making for extremely dry parched conditions across the Moors. Unsettled conditions returned in the closing days of the month with winds gusting to 40mph and close to 50mm of rain falling between the 27th and 29th. The end of the month saw the hot dry conditions return with day-time temperatures again exceeding 20c.

Graphs of temperature and rainfall for the months March to July 2018 recorded at Westerdale, North York Moors, are shown at Annex 5. Figure 6 charts the mean temperature and total rainfall for the month of April for the years 2009 to 2018 at Westerdale, while Figure 7 charts the regional mean temperatures and rainfall for the years 2001 to 2018.

The Westerdale weather station is about 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.

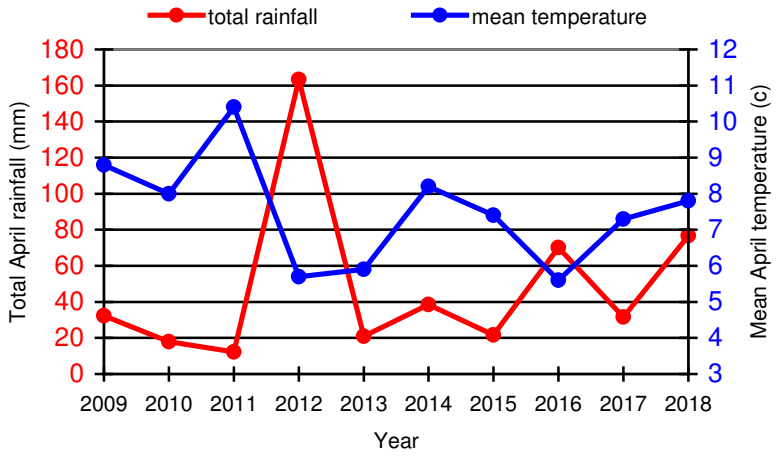

Figure 6: Mean temperature and total rainfall for the month of April recorded at Westerdale, North York Moors, between 2009 and 2018.

5.1.2 Regional Values

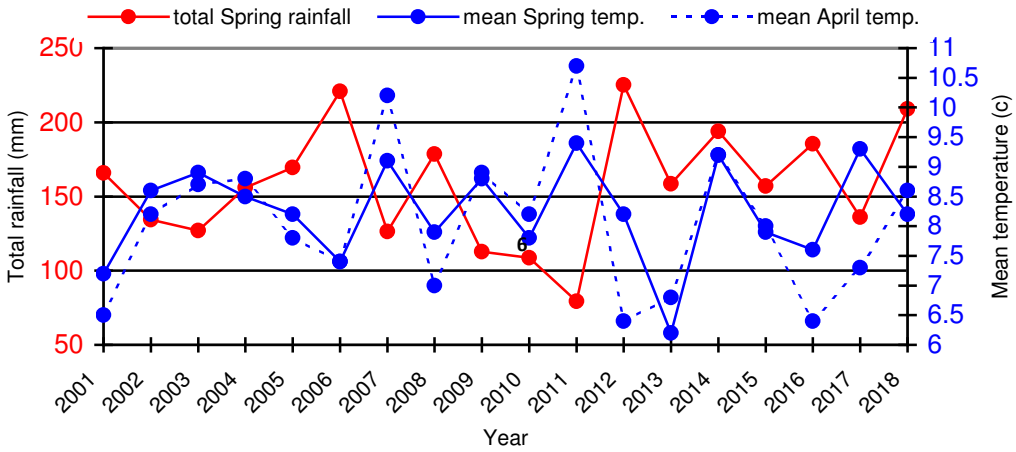

Figure 7: Spring and April mean temperatures and total rainfall between 2001 and 2018.
(Data for Met Office North-East England Region. Spring = March, April, May)

5.2 First Arrivals

Rosedale was monitored for first arrivals from the beginning of the second half of March. The first Ring Ouzel to be recorded in the dale in 2018 was a single male on the east side at Nab Scar on **24th March**. On **1st April** a male and female were seen feeding together in the meadow at Round Hill south; the first female recorded in 2018. Further sightings were reported of two at Bank Top on **2nd April** and three at East Mines on **5th April**.

By **6th April** a male was seen at Sheriffs Pit, three at Bank Top and two in the Hob Crag area - one with a Yellow ring (see 5.3.7). Also on **6th April** the first singing male was heard at Bank Top by the cottages. On **9th April** a male and female were seen feeding just below the track at Nab Scar south and later in the day five (inc. three male and one female) were seen feeding at the south end of Nab Scar south.

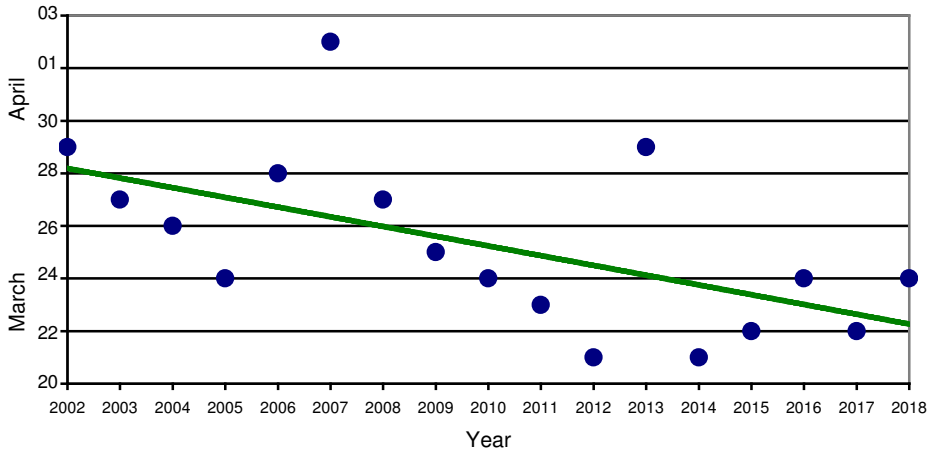

Figure 8: First-arrival date and 17-year trend for the Rosedale area of the North York Moors for the period 2002 to 2018.

5.3 Rosedale Territories and Nests

Eleven Ring Ouzel territories were recorded in 2018 in the Rosedale area of the North York Moors; six less than 2017 representing a drop of around a third on last year. All territories recorded in 2018 had been occupied before in previous years. Despite several visits to Spindle Thorn and a single visit to Loskey Side ford on Spaunton Moor, where a nest was located in 2017, there were no signs of activity at either location.

As in the previous two years an unexplained situation was the low number of territories recorded again on the east side of Rosedale. For several years the north-east side of the dale was a much-favoured breeding area with the Reeking Gill area having the highest breeding density in the dale – typically 3 pairs/km^2 against an average of 0.47 pairs/km^2 for the Rosedale area in general. The reason for the decline over the last three years on the east side of the dale and the apparent move to the west side is unclear as there had been no notable change to the habitat on the east side.

One of the most striking features of the Rosedale study is the remarkable close association of nest sites with the rich industrial heritage. The disused quarries, railway track, cuttings and mine shaft providing over half, 56 per cent, of the locations chosen by Ring Ouzels to build a nest (see Figure 11). Another surprising feature is the growing number of nest sites on relatively level ground on the moor tops, accounting for eight per cent of the total nest sites recorded.

The past 20 years of the Rosedale study has clearly shown the Ring Ouzel to be an adaptable bird when looking for a suitable site for a nest and is prepared to include man-made features in its selection of suitable breeding habitat.

In all, 44 distinct territories have been recorded in the Rosedale area between 1999-2018 (see Table 1). The location of the 2018 territories is shown at **Annex 1**.

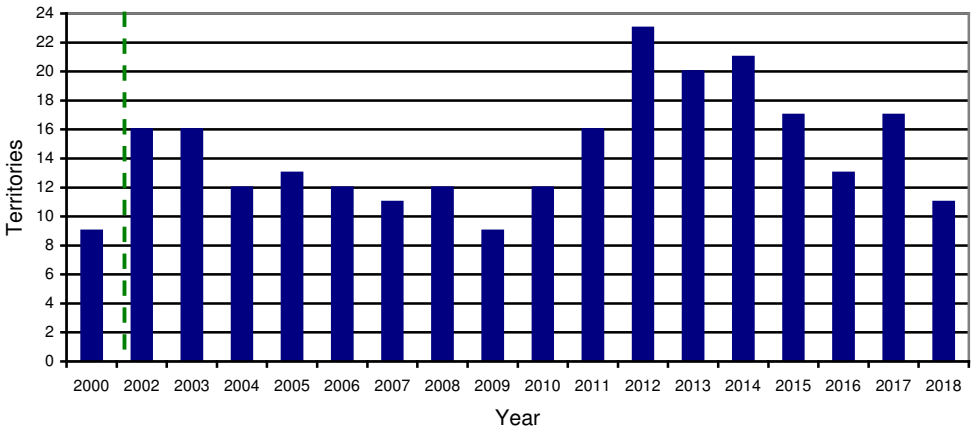

Figure 9: Confirmed & Probable territories recorded in the Rosedale area of the North York Moors between 2000 and 2018. (foot & mouth prevented field work in 2001)

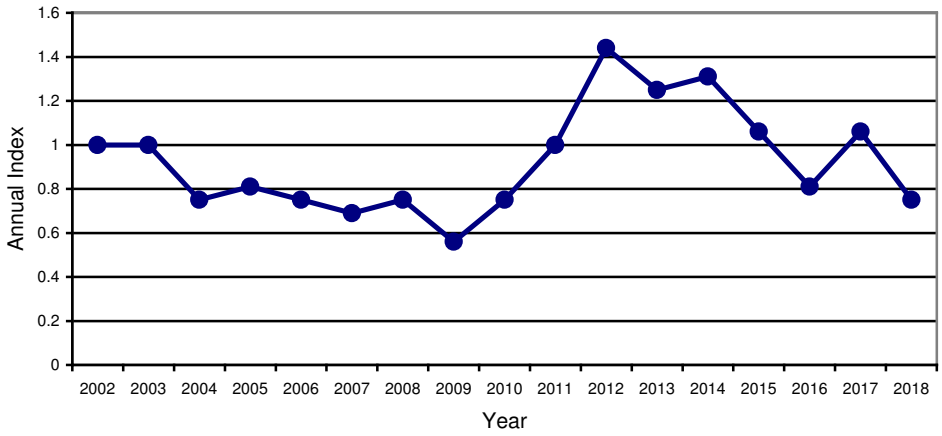

Figure 10: Annual indices of Confirmed & Probable territories recorded in the Rosedale area of the North York Moors between 2002 and 2018 referenced to 2002.

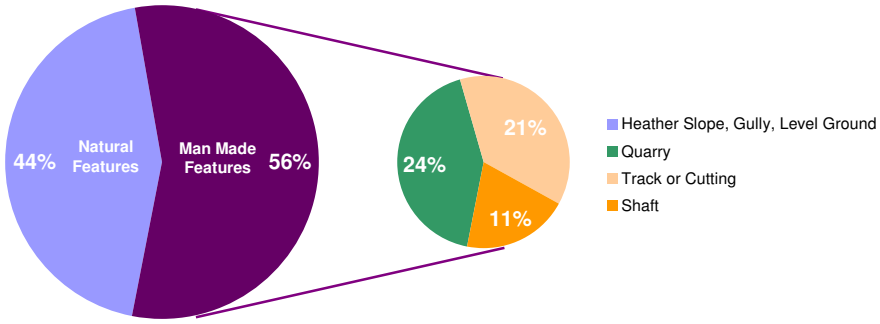

Figure 11: Feature chosen for location of nest in the Rosedale area of the North York Moors. (n=143)

5.3.1 Bank Top

The first sighting here was on **6th April** when two males and what was thought to be a female were seen on top of the kilns at Bank Top; one heard singing a short burst of simple song. On **18th April** a good audio recording was made of a male singing in the singleton tree near the cottages at Bank Top. A sighting on **22nd April** of a male and female feeding by the trackside just east of Hob Crag quarry and then flying off in the direction of Three Howes to the west of Bank Top, was reported by a member of the Scarborough Field Naturalists on their outing to Rosedale.

On **5th May** a male was seen foraging on the moor-side of the intake wall 100m east of Hob Crag quarry. It was then seen flying over the moor in the direction of Three Howes behind Bank Top kilns. There were no further sightings until **12th June** when the under-keeper reported seeing a male along the track between Bank Top cottages and the road; close to where a nest was found in 2016. Further sightings in the same location, of what was assumed to be the same male, were made on several days around the 12th. A visit to the area on the **13th June** found no sign of activity in an hour's observation.

A further report by the under-keeper around this time of a male collecting food near the track leading from the road to Ana Cross was thought most likely to be the same bird seen on **12th June**. On **24th June** there was a reported sighting of a pair of ouzels close to the roadside near a shooting butt just south of Bank Top car park. A wide search of the area on **26th June** found no ouzel activity.

Despite no nest being found there was sufficient activity in the Bank Top area throughout the season to record this as a Probable territory with an early and late nest.

5.3.2 Bank Top east

On **2nd April** a local resident reported seeing two ouzels above Bank Farm on Chimney Bank. Further sightings were made on **18th April** of three males and one female partway down the incline. A little later one was seen foraging on the incline while one flew towards the moor top above the incline where it was seen singing. A male and female were then seen flying off in the direction of Bank Top cottages; the male in pursuit of the female in what appeared to be an act of courtship. There was no further sighting until **5th May** when a solitary male was observed in the singleton tree half way down the incline. There were no further sightings after the 5th.

The incline has been a frequent stop-off place for passage migrants over the years of the study. It was thought likely that some of the early activity in this area were Fennoscandia passage birds and that these had attracted the attention of the resident Bank Top pair, the male of which was defending his territory.

5.3.3 Blakey Lion

There were few reports and there was no evidence of breeding here in 2018.
A male ouzel was reported in the garden opposite the Lion Inn on **11 May**.

On **19 May** a male was singing from a field fence post below the house opposite to the Lion Inn. He was then lost to view but singing was heard from low down on the moor below. Blackbirds fledging young from a small pit near the fence line and north path slightly confused things. A male ouzel also sang from further north near the track side ruin.

5.3.4 Dalehead quarry

On **18 May** the quarry was observed from above at the south end. A male ouzel was sitting, not perched on top of the far bank, facing north. Another ouzel presumably the cutting male was singing from the wall that runs from the Cutting. After 15 minutes chacking was heard from below in the trees. A female ouzel then made a brief appearance below and a male sang somewhere in the north of the quarry while the other male was still on the far bank. All was then quiet for a while until a female ouzel flushed from on the heather below. She circled round at a good distance and the male disappeared from the far bank. A pair was then seen on the bank of the plateau near the track where he sang and she chacked. Ten minutes later both came back into the quarry, the male to the far bank, and the female into the trees below.

The quarry was watched from Dalehead west on the morning of **19 May** as a pair of ouzels fed at the north end of the quarry floor. The female flew south amongst rocks and out of view. The male continued to feed and then chased an intruding ouzel westwards before returning to resume feeding. He moved out of sight and later singing came from trees in the bottom of quarry at the south end. A pair of blackbirds feeding at the north end added to this confusion. An ouzel could also be heard singing in the distance somewhere in the Dalehead area. In the afternoon observation was continued from above the north end of the quarry. The sound of chacking eventually revealed a pair of ouzels feeding below in the quarry. It was decided to descend to the floor of the quarry at which she chacked south out of sight into rocks. Three ouzels then chacked out of the trees, two flying directly out of the east side of the quarry and the other remaining to sing from a tree at the south end. Intermittent singing continued from the south as well as chacking from trees on the eastern face. Later a male sang loudly and chacked from the oak tree near the large rock at the south end of the eastern quarry face. There was also chacking from trees on the eastern face at the north end. All this activity was frustratingly inconclusive but there would appear to be at least one territory in the quarry.

On **24 May** a male was heard singing in the quarry from Dalehead west. Later when viewing from above the south east end of the quarry a female flew in from the south west and chacked in to trees below and then went quiet. A male sang from the bottom of the quarry. After walking back to Dalehead west the female could be seen feeding in the middle of the quarry floor before eventually flying into trees at the north end. Sightings still indicate a nest at the north end of the quarry and possibly one at the south east edge.

At Dalehead faint simple song could be heard coming from the direction of the quarry on **9 June.** The descent to the quarry was made from the north and after ten minutes chacking could be heard from above on the northern cliff face. A female followed by the male flew down to feed on the quarry floor. On moving position to get a better view of the cliff above, after 12 minutes the female flew back and into one of the trees masking the cliff face and out of view. The male flew up into the isolated tree away from the cliff. The female was not relocated, the western half of the cliff face now being well screened by the growing trees. All remained quiet and the quarry was left. On return in the early afternoon the descent was made to observe from near the oak tree towards the south end. Blackbirds and a male Redstart were active and a Willow Warbler was singing. After a long wait there was chacking from behind and an ouzel flew into the trees masking the northern cliff face. 15 minutes later there was a sudden commotion and a Blackbird and Ring Ouzel made a joint attack on a Jay and drove it out of the quarry. In 2011 a nest was predated here and a Jay had been chased from the area on that occasion. After another 15 minutes the female flew down into the quarry to feed. It was not clear where she came from. The male then followed her down. After 12 minutes the female returned to land in the isolated rowan tree near the east end of the northern cliff face. She then dropped to the ground and was not seen again. The nest must be somewhere high on the cliff face. On approaching Dalehead a male Broad-bodied Chaser was active over a small pool on the track just north of the ponds. Chacking was heard from the top of the quarry at the north end on **5 July.**

The quarry is a difficult site to monitor but it was frustrating not to be able to locate the nest at the north end where there was so much activity.

5.3.5 Dalehead west

On **16 April** a pair of ouzels feeding close together just below the track flushed out of view towards the dale side mounds. They did not emerge when a couple of walkers passed through but a male later appeared in a tree at Dalehead. He remained silent while a Mistle Thrush sang for several minutes from the top of the same tree. Both flew off as another walker came through. The female was not relocated. There was no evidence of a territory being established here in 2018.

5.3.6 East Mines

Snow and hard frost still lingered early on the morning of **5 April** when three ouzels chacked out from just north of East Mines before flying across the dale towards Sledge Shoe and Middle Ridge.Three ouzels were also observed between the two sets of kilns on **9 April.**

On **23 April** a female flushed from the slope just below the track and in to broom. She chacked a couple of times and disappeared into the extensive broom and was not relocated.

5.3.7 Hob Crag quarry

On **6th April** a male ring ouzel was seen flying off the moor and landing some 200m east of Hob Crag quarry. The bird then foraged in the grassy area on the moor side of the intake wall for 15 minutes or so before slowly making its way towards the quarry. The bird was seen to have a **yellow** ring on the left leg but positive identification of the ring letters proved impossible owing to the distance; of note was that a yellow ringed bird was recorded in the same area in 2016 and 2017. The nearest nest to Hob Crag quarry where pulli were rung with yellow rings was on the moor plateau at Bank Top in 2015, some 500m south of the quarry. If this was the nest where this bird came from then 2018 would be the third breeding season for this male. Later in the day a second male was seen singing from a rock below the main part of the quarry then flying off into the dale-bottom and out of view.

There were no further sightings until **22nd April** when a member of the Scarborough Field Naturalists on approaching the quarry reported hearing an ouzel singing in the quarry. On entering the quarry a pair was observed in the main part of the quarry, the male having a **yellow** ring. On **5th May** what was likely the same **yellow** ringed male was seen singing from a large boulder below the main part of the quarry. The bird sang almost continuously from 1351 to 1415 hours with a mixture of simple and complex song before suddenly flying off and out of sight. A photo of the bird was taken in an attempt to read the lettering on the ring but unfortunately the strong sunlight reflected off the yellow ring making it impossible to see the black lettering - see front cover photo. This was the last sighting of the **yellow** ringed bird.

There was a further sighting on **16th May** when a lone female was seen feeding 50m east of Hob Crag quarry. She slowly made her way towards Bank Top before flying back over the quarry and on to the moor top out of view. On **31st May** a male was seen feeding two juveniles in the meadow just east of the quarry. One juvenile was seen standing under a rock overhang the other flying down a gully into the wooded are below the quarry. At the same time another ouzel was heard singing in the quarry. Analysis of the sonogram of this bird's song showed it to be the same ouzel recorded later in the day at Thorgill Bank quarry and was probably an unattached male looking for a female (see 5.3.17).

Further activity was recorded on **26th June** when a pair was observed in the main part of the quarry. A short while later the female was seen flying into the base of a tree growing out of a crack in the quarry wall. A closer inspection of the area flushed the female from a ledge high up behind the tree. The location looked to be a good nesting site but was inaccessible so a detailed inspection was not possible as a consequence no nest was found. The male during this time was close by chacking giving the impression that a nest was close. On **5th July** the quarry was observed for over an hour but with no sighting of the pair or any ouzel activity, the 26th June being the last recorded ouzel presence in the quarry.

5.3.8 Matty Carr quarry

The first sign of activity in the Matty Carr area was on **15th April** when an unsexed ouzel was seen flying along the dale-bottom from the direction of Matty Carr south towards the quarry. A look in the quarry found no sign of ouzel activity. On **26th April** a male flew from the north end of the quarry and dropped to ground in an area of deep heather 50m north-west of the quarry. Approaching the area the bird was flushed, flying off in the direction of the track cutting and out of sight. On **3rd May** a male flew in to the singleton tree at the south end of the quarry from the Matty Carr south direction in response to the lure. After chacking for a minute or so he flew back towards Matty Carr south and out of view. The male returned after 10 minutes landing in the same tree as earlier before flying off over the quarry and landing nearer the track before then flying off over the moor top and out of view. Checked previous year's nests in cutting and quarry but no sign of re-use.

On **10th May** the lure was used at the south end of the quarry. A male responded flying in from the direction of Matty Carr south and landing in the singleton tree at the south end of the quarry. The bird was seen to be carrying a small grub. After a few minutes the bird flew on to a clump of heather above the quarry before then returning to the same tree and then back in the direction of Matty Carr south and out of sight. On **24th May** a male was seen chacking in the singleton tree at the south end of the quarry. The bird was observed chacking continuously for over five minutes before swirling mist enveloped the area and brought matters to an abrupt end.

There were no further sightings after this date in the Matty Carr quarry area. See 5.3.9 below for comment on the breeding status in the Matty Carr area.

5.3.9 Matty Carr south

There were various sightings during the early part of the season of ouzels flying into Matty Carr quarry from the direction of Matty Carr south (see 5.3.8 above). A more detailed search of the area south of the quarry on **10th May** found no evidence of ouzel activity. On **7th June** a male was flushed from the trackside at the south end of Matty Carr south - SE 6895 9797 - and flew off chacking over the dale-edge into the dale-bottom and out of sight. This was the last sighting of activity in the Matty Carr south area.

The early activity in the Matty Carr quarry and south areas at the beginning of the season strongly suggests that a pair had an early nest that was most likely in the Matty Carr south area; though this was not found, there was sufficient evidence to record this as a Probable territory. The lack of activity after May points to there being no attempt at a second clutch in the Matty Carr area.

5.3.10 Nab Scar

The first Ring Ouzel contact of the year in the study area was here when chacking was heard on **24 March**. A lone male was located in a Rowan tree almost opposite the cairn. After more chacking as he faced the Scar he suddenly flew out over the cairn across the dale in the direction of Matty Carr.

A pair fed for about an hour in a field at the south end on the morning of **9 April** and were still present on returning in the early afternoon. Five more including at least one female were feeding south of the cairn before flying to Nab Scar North. There was some singing as well as chacking. Two flew high along the Scar summit in the early afternoon.

On **1 May** a male sang from a tree at the north end of the Scar. He dropped to the ground and sang from a boulder and was then lost to view on the ground. There was no further contact in the next hour during which a pair of Buzzards circled overhead before moving on and then a Sparrowhawk made a brief pass over the Nab. On returning to the site in mid afternoon a male was located feeding dale side of the track south of the cairn before eventually flying back to the tree at the north end of Scar. There was no chacking or any sign of female.

There was no evidence of a territory being established at Nab Scar and some of the early April sightings were probably of passage birds. Reports here and elsewhere of ouzels flying across the dale are perhaps significant as there have been more nests on the west side in the last two or three years.

5.3.11 Reeking Gill

There were no reports of territorial behaviour within the Gill but a pair bred successfully in the adjacent cutting (see 5.3.12).

A lone ouzel was in the second Rowan tree south of the gill on **9 April.**

5.3.12 Reeking Gill cutting

On **12 May** a Ring Ouzel was heard singing ahead as the Gill was approached at 12 noon. A male was located on the southern end of the track side fence at the end of the cutting. He sang for ten minutes and then dropped to the ground to feed moor side and then out of view. It was decided to descend and to watch and wait from a boulder moor side just north of the gill. He sang out of view for another 15 minutes even while walkers passed through. Then all was quiet until 13:00 when a movement was heard above and behind and two ouzels were seen to flutter up together and then a third ouzel appeared. The first two were males and they flew across the path and landed together close to the path dale side. While this was happening the third ouzel was glimpsed flying north along the cutting and into heather. The two males had a brief altercation and one gradually shepherded the other along the ground away from the cutting before it eventually flew off towards Nab Scar. Assuming the third ouzel was the female the point where she disappeared into the heather was fixed before the north end of the cutting was approached. During the return above the cutting the nest could now be seen on the north east side. The return was made back along the floor of the cutting from the north. The nest was just out of view until

the final couple of metres so sufficient noise of approach was made to ensure she flushed before a sudden appearance could startle her. She flushed at several metres and the nest quite exposed to view, was above head height and contained four eggs. On passing later in the day the female could be seen back on the nest incubating.

On **18 May** the female was watched on the nest for 35 minutes and then the male came in from the north and perched on top of the cutting nest side before working his way south softly singing. The female then flew off the nest and followed the male over the opposite bank and fence towards the dale side of the gill. In their absence the nest was quickly checked and it still contained four eggs.

The Cutting nest was approached from the north end on **19 May** and the female flushed south out of the cutting at about 10 m. The nest contained three newly hatched chicks and one egg.

On **24 May** the female was off the nest and on inspection it contained four sleeping chicks. Now five days old as one stirred the eyes were just opening. There was no sign of the adults. As the Cutting was approached on **27 May** a male was singing from somewhere just north of the quarry. The adults were not in the vicinity and a quick check of the nest revealed four chicks sitting tight. The rings were prepared out of sight of the nest before collecting and ringing the chicks with a yellow ring (ring letters: DA, DB, DC & DE). The female returned to the vicinity during the latter stages of ringing with some chacking but settled out of sight.

Rain was forecast so only a brief visit was made to check the nest on the morning of **2 June.** The male was located on the cutting fence as Reeking Gill was approached. He seemed agitated and there was no sign of the female on the nest or nearby. The male chacked up and down the cutting, frequently settling on the heather. Having retreated northwards for a while to let walkers pass through, when all was clear the cutting was entered and the nest was empty and undamaged. There was still no sign of the female and the behaviour of the male indicated the presence of fledglings nearby so the area was vacated as rain started. The cutting was deserted on **9 June** so the area was observed from track side just north of the gill. After a long wait, first one and then both adults emerged from ground cover. They were collecting food just below the track, dale side just beyond the gill. They were only occasionally in view for a period of about an hour and were obviously feeding fledglings which were well concealed. They were left undisturbed. A pair of Kestrels was active above the gill.

On arrival at the Cutting on **5 July** fledglings could be heard calling at the south end on the far bank amongst bracken and heather. Calls came from four different places about 30 m apart. During the next 20 minutes a male flew up on to the top between Reeking Gill and the Cutting and gave one round of simple song before disappearing into the heather. The fledglings continued to call periodically none showing themselves and there was no sign of movement. The impression was that these were recently fledged rather than the chicks which had fledged at the end of May and would by now have been expected to be much more active and mobile.

5.3.13 Round Hill east

On **26th April** a male was seen singing in a tree close to last year's nest site. After a few minutes it flew off down a nearby gully into the dale-bottom and out of sight. Later a male was flushed from the trackside between Round Hill east and Sheriff's Pit and flew a short distance along the track towards Sheriff's Pit before flying off in the direction of Round Hill south and out of view. Later in the day a male and female were seen flying from the direction of Round Hill south and landing on the track close to where the male had been observed earlier in the day. Both then flew off in the direction of Sheriff's Pit and out of sight.

The next sighting in this area was on **3rd May** when a male and female were seen in a tree in the dale-bottom at the north end of Round Hill east. After a few minutes the male dropped to the ground below the tree and out of view. The female remained in the tree for a further five minutes before flying off in a northerly direction out of view. A second male then flew into the same tree from the south end of Round Hill east but was then lost from view. A while later a male was seen singing in a tree close by and after a few minutes flew into a small track side quarry immediately above the tree and out of view. A look in the quarry flushed a female from a nest containing four eggs.

On **10th May** a male was seen singing in a tree just below the track and close to the quarry nest – an audio recording of the song was made. Checking the nest two newly hatched chicks

were seen and two un-hatched eggs. A further inspection of the nest was made on **16th May** when three pulli, estimated to be six days old, and one un-hatched egg were seen. Three pulli were ringed with a yellow ring on **18th May** (ring letters: CU, CX & CY).

A look at the nest on **24th May** found it to be empty. On close inspection the nest was found damaged, with a few outer stems of heather broken and the inner grass lining partially pulled out. Just outside the nest were around 20 soft feathers that could have been lost by one of the pulli while attempting to escape. The most likely turn of events was the nest was predated sometime after the 18th May when the chicks would have been eight days old. On a typical 13-day cycle the chicks would have fledged around the 23rd May in the normal course of events. It is just possible that the predator may have struck close to the fledge date in which case all three may have escaped, albeit one loosing a few feathers in the struggle. However, the most likely scenario is that all three were taken, assumed by a ground predator, and that non-survived. This nest was recorded as predated.

On **31st May** a recording was made of a male seen singing in a tree close to the predated nest. Analysis of the sound recording made of this bird, and the one recorded in the same tree on the 10th May, showed them to be different males. A second male flew into a nearby tree close to the singing male and almost immediately flew off in the direction of Round Hill west closely followed by a female that had appeared from the direction of Round Hill south; thought most likely to be the pair from Round Hill west (see 5.3.14). On **7th June** an unseen male was heard singing from a tree close to the predated nest. A further sighting was made on **21st June** when two ouzels were seen flying from the Round Hill east area towards Sheriff's Pit. There were no further sightings in this area after this and no evidence of a replacement or late nest.

5.3.14 Round Hill west

The first sighting of activity in the Round Hill west area was on **26th April** when two ouzels, one male the other of unidentified sex, were seen in the singleton tree below the track at the north end of the Round Hill west cutting. The male remained in the tree chacking while the other flew off into the dale-bottom and out of sight. On **3rd May** a pair was seen foraging in the dale-bottom just above the intake wall; the female occasionally stopping to preen. Both were observed in the same area for over 15 minutes before being lost from sight. A further sighting was made on **10th May** when a male and female were seen feeding together below the intake wall. After 15 minutes the female flew up the side of the dale towards the track and into the north end of the cutting and out of sight. A short time later the cutting was searched and the female flushed off a nest containing four eggs. There was a brief sighting of the male at the south end of the cutting at this time.

On **16th May** the nest was inspected and three pulli estimated to be four days old and one un-hatched egg were seen. A further inspection of the nest on **18th May** found only two pulli in the nest; both were rung with a yellow ring (ring letters: CT & CN). A short while later the female was seen returning to the nest with food. The next sighting was on **7th June** when a male was seen feeding two juveniles in the grassy area below the track at the north end of the cutting. They were observed for over 20 minutes and in that time the young were seen making short flights around the area and into a nearby tree. At this time a second male was seen flying past from the direction of Sledge Shoe towards Round Hill east.

On **21st June** the male was flushed from the trackside at the north end of the cutting and flew into the dale-bottom and out of view. A juvenile was then seen motionless close to track where the male had been flushed. After a minute or so the juvenile flew off after the male and out of sight. A short time later a female was seen foraging in the dale-bottom. After 10 minutes she flew up the dale side into the north end of the cutting and out of sight. Taking a closer look in the cutting the female was spotted on the track at the south end of the cutting. After a few minutes a juvenile appeared in the same area as the female. The female was then seen shooing the juvenile away along track towards north end of cutting; mysteriously this juvenile had no yellow ring so was not from either the Round Hill west or Round Hill east early nests. The female was then disturbed by a passing walker and flew over the cutting and into the dale-bottom out of view. Looking into the dale-bottom from the north end of the cutting a second female was seen foraging and then flying off towards Sledge Shoe. While this was being observed the cutting female appeared from an unseen location in the dale-bottom and then flying into the north end of the cutting. A closer look in the cutting flushed the female from a nest containing three pulli a day old;

the nest was 44 metres from the first nest on the west side of the cutting and was the first time that a nest had been found on the east bank of this cutting. Calculation suggested that 10 days had elapsed between the first nest fledging and the first egg being laid of the second nest. Allowing three to four days for the second nest being built, this suggests the female had a break of about a week before commencing a second clutch.

On **27th June** four pulli about seven days old were rung with a yellow ring (Ring Letters: DF, DJ, DI & DN). One pulli was noticeably smaller. The male during this time was nowhere to be seen. On **28th June** a quick check was made of the nest and four pulli were seen sitting tight. The female was seen on the track close to the nest. A further visit was made on **2nd July** when the female was seen at the north end of the cutting taking food into the cutting bank in four separate locations; one on the west side and three on the east side. During this time the female was heard making a tuc-tucing contact call and the fledglings replying. The fledglings were located around 50m north of where the nest was, suggesting they could have fledged on 1st July at just 12 days. The female was later seen collecting food from the trackside and on few occasions returning to the cutting with food from the direction of the dale-bottom. The male was noticeably absent at this time. A look at the nest found one pulli dead just behind nest but alongside it (Yellow Ring DJ). The stunted development of the dead pulli suggested it had died when it was 7/8 days old; probably the day after it was rung.

On **5th July** the female was seen in the middle part of the cutting searching for food on the trackside. She popped into the ditch on the moor side of the track and came out after five minutes or so before returning again to the ditch and out of view. Walking past the location she was flushed, flying off over the moor and out of sight. Some 10 minutes later she was briefly seen perched on a clump of heather at south end of the cutting before being lost from view. There were no further sightings of the female and no sign of a male during this period of observation.

There were no further sightings of ouzel activity in the Round Hill west cutting area after this.

5.3.15 Sheriff's Pit

The first sighting here was on **6th April** when a male was seen singing from the newly erected safety fence that surrounds the disused pit shaft. After a short time he flew off over the moor top and out of view. On **15th April** an unseen bird was heard singing in the Sheriff's Pit north area. A short time later while observing the pit from the nearby ruins a male flew from the direction of the dale-bottom on to the pit fence. There was a short snatch of simple song before he then dropped to the ground on the north side of the fence and out of view.

On **18th April** after 20 minutes of observation a male appeared on the pit fence and sang for two minutes or so before flying off over the track towards the dale-bottom and out of sight. An audio recording of the song was made. On **26th April** a male was seen foraging on the moor side of the pit just outside the fence before flying off northwards and out of sight. There was no further sighting until **4th May** when a member of the National Park's Land of Iron team photographed a male on the pit fence. A further sighting was made on **10th May** when a male was seen singing from a clump of heather 25 metres on the daleside of the track just north of the pit and close to where two nests were found in 2017. After a few minutes he flew off in the direction of the dale-bottom and out of sight. Spectral analysis of the song showed it to be the same male recorded singing on the pit fence on 18th April. On **16th May** a male was flushed from the daleside of the track near the pit, flying off in the direction of Thorgill Bank; thought most likely to have been the male that was known to be holding a territory at Thorgill Bank west.

On approaching the pit on **24th May** a male was heard singing from an unseen location close to the shaft. After a few minutes a male flew onto the pit fence and sang a short burst of simple song before then dropping into the shaft out of view. Taking a closer look at the pit shaft the male was flushed from deep inside the shaft, landing on the ground just inside the fence. The male was then seen rummaging around the base of one of the fence posts before flying off over the moor and out of view. Observing the shaft from the nearby ruin on **31st May** a male landed on the pit fence and briefly sang before dropping into the shaft out of view. Approaching the shaft the male was heard singing from the depths of the shaft. After few minutes the male flew out heading north and out of sight; an almost identical situation to the observation on 24th May. This was to be the last recorded sighting of ouzel activity in the Sheriff's Pit area.

Despite frequent sightings of a male in and around the disused pit shaft, there were no sightings of a female at any time throughout the season. The absence of a female during the

breeding season just adds to the mystery at this well used breeding site and raises the question as to whether or not a pair bred there in 2018. However, the presence of a singing male for most of April and throughout the whole of May points to the existence of a territory here and as such Sheriff's Pit has been recorded as a Probable territory.

5.3.16 Sledge Shoe

On **15th April** an unseen ouzel was heard chacking in the dale-bottom at Sledge Shoe. At the same location on **26th April** a male was seen chacking in a tree just north of the public footpath that drops down from the track into the dale-bottom. After a few minutes the bird flew off in a wide circle over the moor before returning to the same tree when it then sang a short snatch of simple song. On **3rd May** a male was seen in the same tree where a male was seen on the 26th. After a few mintes the male flew off to the singleton tree at the south end of the Sledge Shoe territory where it then sang for a minute or so. A short time later a female was seen foraging near the steps that lead down from the track into the dale-bottom. After 10 minutes she flew off into a gully near the tree where earlier a male had been seen singing. A close look into the gully from the daleside edge found no sign of the female, giving the impression that she may have returned to a nest in the gully. The next sighting was on **10th May** when a female was seen stealthily making her way into the same gully but was then lost from view. Taking a closer look at the gully the bird was disturbed while on the ground foraging and flew off up the dale and out of view.

On **24th May** a male was seen chacking just below the track close to the Sledge Shoe footpath. He flew into the dale-bottom out of view. Ten minutes later two males were seen in the dale-bottom just south of the footpath. One flew to where the earlier bird had been seen the other flew off in the direction of Round Hill west out of sight. On **7 June** a male and a juvenile were seen flying high towards Round Hill west from the north end of the Sledge Shoe territory and landing in the Round Hill west area and out of view. Later in the day a male was seen singing in a tree at the south end of the Sledge Shoe territory. A while later a male was seen perched on a rock close to the Sledge Shoe footpath before then flying off into a rocky area close to the gully where a female had been seen going into on 3rd May. Later in the day, just north of the Sledge Shoe footpath, a male was seen on the ground 20 metres below the track singing. He sang for over five minutes before flying off over the dale edge out of sight – audio recording made. Spectral analysis ot the recording showed it to be the same bird recorded at Round Hill east on 10th May singing in a tree just below the track close to the nest site. On **21st June** two females were seen foraging in the grassy area below Round Hill west. One flew off northwards towards Sledge Shoe the other into the north end of the Round Hill west cutting; where a second nest had been located (see 5.3.14).

There was no further activity in the Sledge Shoe area after 21st June. Although no nest was found the frequent sighting of a male singing during the later part of April and throughout May and the early part of June, as well as the presence of a female on several occasions during May and June, lead to the conclusion that an early and possibly late nest had been attempted.

5.3.17 Thorgill Bank quarry

On **16th May** an unseen ouzel was heard singing from a location close to Thorgill Bank quarry; the male singing continuously for five or so minutes. A search of the quarry and surrounding area found no trace of the bird. On **31st May** a male was seen on the quarry cairn singing for around 15 minutes before dropping to the ground out of view. Later in the day a male was seen again on the cairn singing. Analysis of the sonogram of the bird's song pointed to it being the same ouzel recorded earlier in the day at Hob Crag quarry, suggesting it was most likely an unattached male roaming the area looking for a female (see 5.3.7).

The next sighting was on **13th June** when a male was flushed from the quarry. It first flew off eastwards before turning back and flying past the quarry westwards out of sight. This was the last sighting until **5th July** when the moor keeper reported seeing an ouzel immediately above the quarry close to the track. There were no further sightings after this in the quarry area.

5.3.18 Thorgill Bank west

The first sighting at this location was on **22nd April** when a member of the Scarborough Field Naturalists reported seeing a male and female feeding close to the track some 300 metres west of the old sheepfold at Thorgill Bank west. On **5th May** a male was seen in the Thorgill Head

area, 500 metres west of the sheepfold, flying up the gill from the dale-bottom towards the head of the gill before dropping to ground 50 metres before the track. On **16th May** a male was flushed from the trackside 200 metres south of Sheriff's Pit, flying off high towards Thorgill Head and out of sight. The next sighting was on **31st May** when a male was seen on the wall of the sheepfold. The bird remained on the wall for five or so minutes before dropping to ground below the wall and out of sight. Later in the day a male and one juvenile (possibly two) were flushed from the trackside 200 metres west of the sheepfold. Both flew off down the dale before dropping to ground some 100 metres below the track out of view. A while later the male was seen in the same area on a clump of heather, giving the impression that he was keeping watch on the juveniles hidden in the heather nearby. There were no further sightings in the Thorgill Bank west area after the end of May.

5.4 Breeding Productivity

The low number of breeding pairs this season was reflected in the fewer nests that were located; just four, one on the east side and three on the west. All nests used man-made features, three in cuttings and one in a small trackside quarry. Three nests, Reeking Gill cutting Round Hill west and Round Hill east, were early nests with the latter recorded as being predated at the chick stage. The pair at Round Hill west had a late nest 40 metres from the first nest but on the east side of the cutting; the first time this side of the cutting had been used in the 20 years of the study. Overall productivity for 2018 was fractionally below the 17-year mean of 3.10 (see Figure 12) with the mean number of fledged young per laying pair being 3.00; the same as 2017. This is the sixth year since 2012 that below average productivity has been recorded and is most likely a consequence of early nest predation and fewer late nests.

Most Ring Ouzels will attempt a replacement nest if the first fails, though this may not be for a week or more later. As a result it may be well into June before the young from this nest fledge - assuming all goes well and the replacement nest is not predated. For most birds this would make it too late in the season to start a late second nest; the breeding season ending for most Ring Ouzels around the first week in July. In effect, for those birds that had their first nest predated, they would have run-out of time and the breeding season for them would be over with at best just one successful clutch to show for the season.

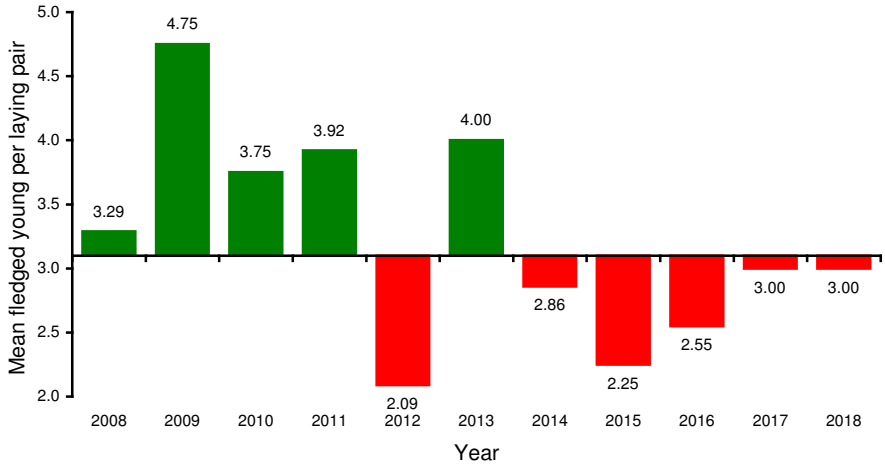

Figure 12: Mean fledged young per laying pair for Rosedale and other areas of the North York Moors between 2008 and 2018 relative to 17-year mean of 3.10

Figures 13 and 14 below show the annual hatching and fledging success for first and second nests. Hatching success looks at all the eggs laid and the percentage of these that hatched. Similarly, fledging success looks at all the eggs laid and the percentage of these that hatched

then successfully fledged. A value of 1.0 would indicate 100% success whereas 0.5 would indicate 50% success - that is only half of all eggs laid hatched or fledged.

In 2018 83% of 1st (early) nest eggs hatched with a half, 50%, fledging. Of the 2nd (late) nests monitored, 87%, of eggs laid hatched with three quarters of these, 75%, successfully fledging.

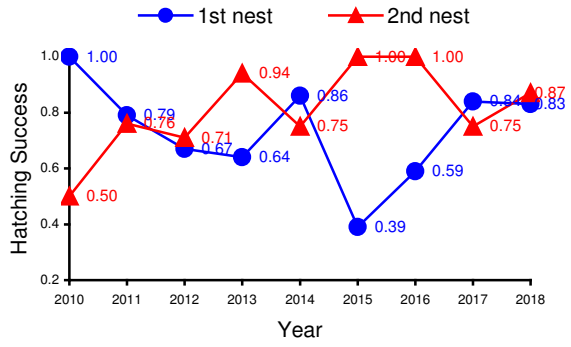

Figure 13: Annual first and second nest hatching success for the Rosedale area of the North York Moors between 2010-2018.
Data from Annex 3, Table 1, for known and likely values.

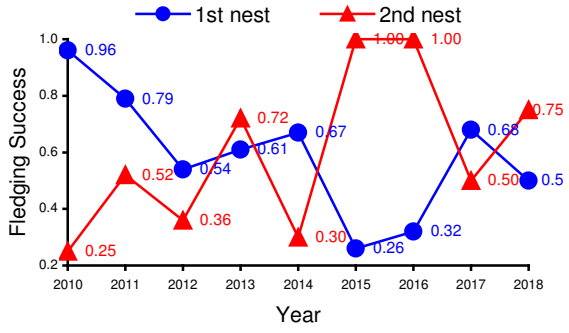

Figure 14: Annual first and second nest fledging success for the Rosedale area of the North York Moors between 2010-2018.
Data from Annex 3, Table 1, for known and likely values.

5.5 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.

The method used to determine early and late occupancy 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) - see Annex 5. The graph at Figure 15 below shows the ratio of late to early occupancy between 2008 and 2018 relative to 11-year mean of 0.54; suggesting just over half, 54 %, of Rosedale Ring Ouzels have on average a second nest. Also to note is the below average occupancy of three of the last five years.

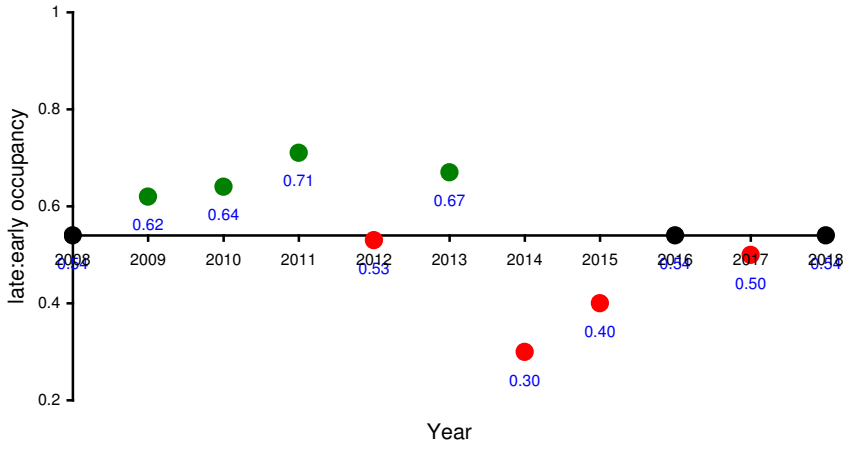

Figure 15: Annual ratio of late to early territory occupancy for the Rosedale area of the North York Moors between 2008-2018 relative to 11-year mean of 0.54

5.6 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 mainly prefer the side of the cutting facing east – in 2018 a pair had a late nest on the east side of the cutting, the first to be recorded on this side. 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. The graph at Fig.16 for all nests in the Rosedale area (data from 1999 to 2018) 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 - see Fig. 17 and 18. 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.

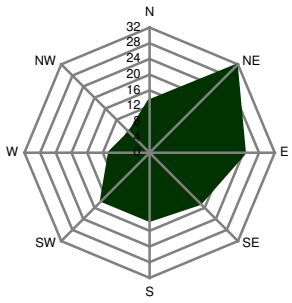

Figure 16: Nest aspect of all nests in the Rosedale area.
Data from Annex 4, Table 1. n=140

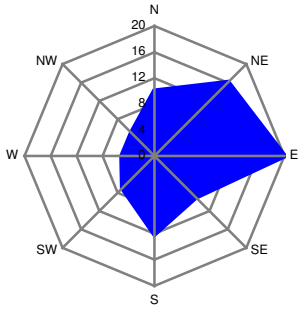

Figure 17: Nest aspect of first nests in the Rosedale area.
Data from Annex 4, Table 1. n=84

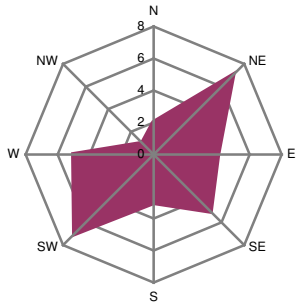

Figure 18: Nest aspect of second nests in the Rosedale area.
Data from Annex 4, Table 1. n=34

In Figures 16 to 18 above the intercardinal points NNE, ENE etc. are not shown. This is 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.

5.7 Nest Elevation

Due to the low-lying nature of the terrain, most Ring Ouzel territories in the North York Moors are confined to a narrow altitudinal band lying between the 250 and 400 metre contours. The highest point on the North York Moors lies at 454 metres on Urra Moor and in Rosedale just over 400 metres at Rosedale Head. In the Rosedale area the lowest nest was found at Loskey Beck at 218 metres and the highest above Reeking Gill at 392 metres; with the mean and median altitude being 324 and 331 metres respectively. Just under 70% of nests found were in a 50 metre band between the 300 and 350 metre contour. The restricted altitudinal band for breeding Ring Ouzels may point to climate change being a potential problem in the coming years for the North York Moors population. Figure 19 shows the elevation of 151 nests recorded in the Rosedale area of the North York Moors between 1999 and 2018.

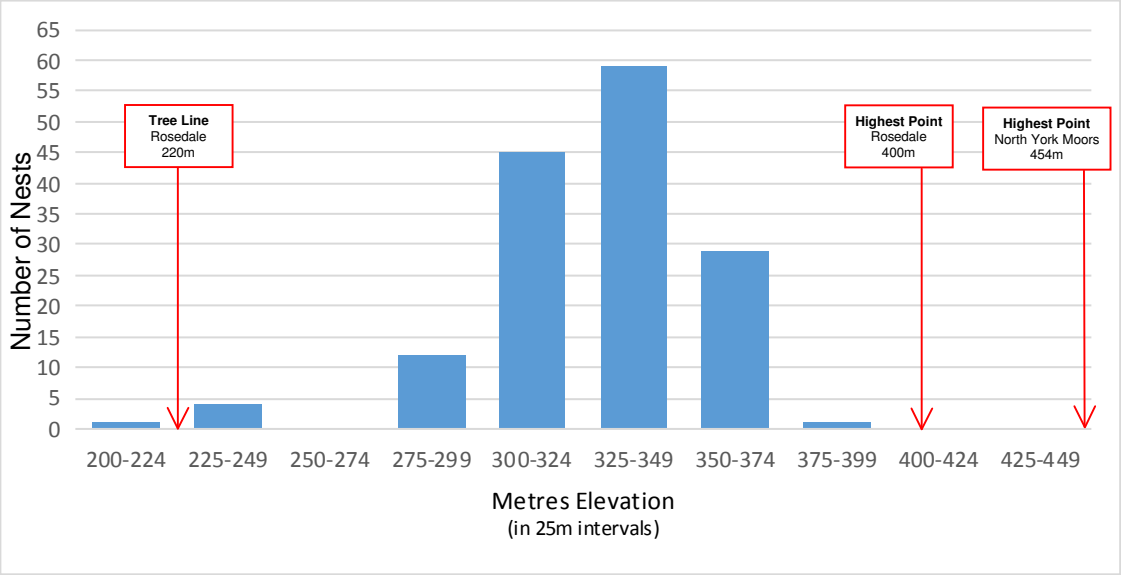

Figure 19: Elevation above mean sea level of nests recorded in the Rosedale area of the North York Moors between 1999 and 2018. Data from Annex 4, Table 1. n=151

5.8 Spring Passage Migrants

Fennoscandia Ring Ouzels on passage are seen most years in Rosedale and the wider North York Moors during April. These birds stop off to feed for a few days before commencing their onward journey to Scandinavia. On **9th April** a pair seen feeding at Nab Scar on the east side of the dale may have been local birds but at least five more near by were probably on passage. On **11th April** over 40 were seen on the south side of Roseberry Topping with a further five sighted above Kildale - both locations are in the North-West corner of the Moors. Again on **15th April** 10 were reported feeding on the south side of Roseberry Topping.
There were early sightings on the Yorkshire coast of a male at Spurn Point on **12th January** and a little further north a female at Aldbrough on **22nd February**. In addition, the Teesmouth Bird Club recorded sightings at the following places along the coastal fringe of Cleveland: South Gare a single bird on **6th April** and two on **14th April**; five birds at Hummersea on **7 April**; two at Hunley Hall on **14th April** and five at Warsett Hill on **15th April**.

An unusual sighting of what was likely to be an over-wintering Ring Ouzel was reported by several local birders at Brompton-by-Sawdon (SE942821) just west of Scarborough. The first sighting was on **14th January** when a lone male was seen feeding in a meadow near the church. Further sightings, of what was assumed to be the same male, were seen in the same location on **20th January** and **1st, 4th** and **25th February**. There were no further sightings after this.

5.9 Late Summer Activity

There were several reported sightings in August and September. The first on **26th August** when five were seen feeding in Rowan trees above Medd's Farm on the west side of the dale. Two were seen flying in a northerly direction over Blakey Swang on **28th August** and two above Nab Scar on **30th August**. On **15th September** over 15 were seen at Gill Bank above Thorgill on the west side of the dale.

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 Tom Denney, Geoff Myers, Robert Stark and Eric Wood. Our grateful thanks to all of them.

7. REFERENCES

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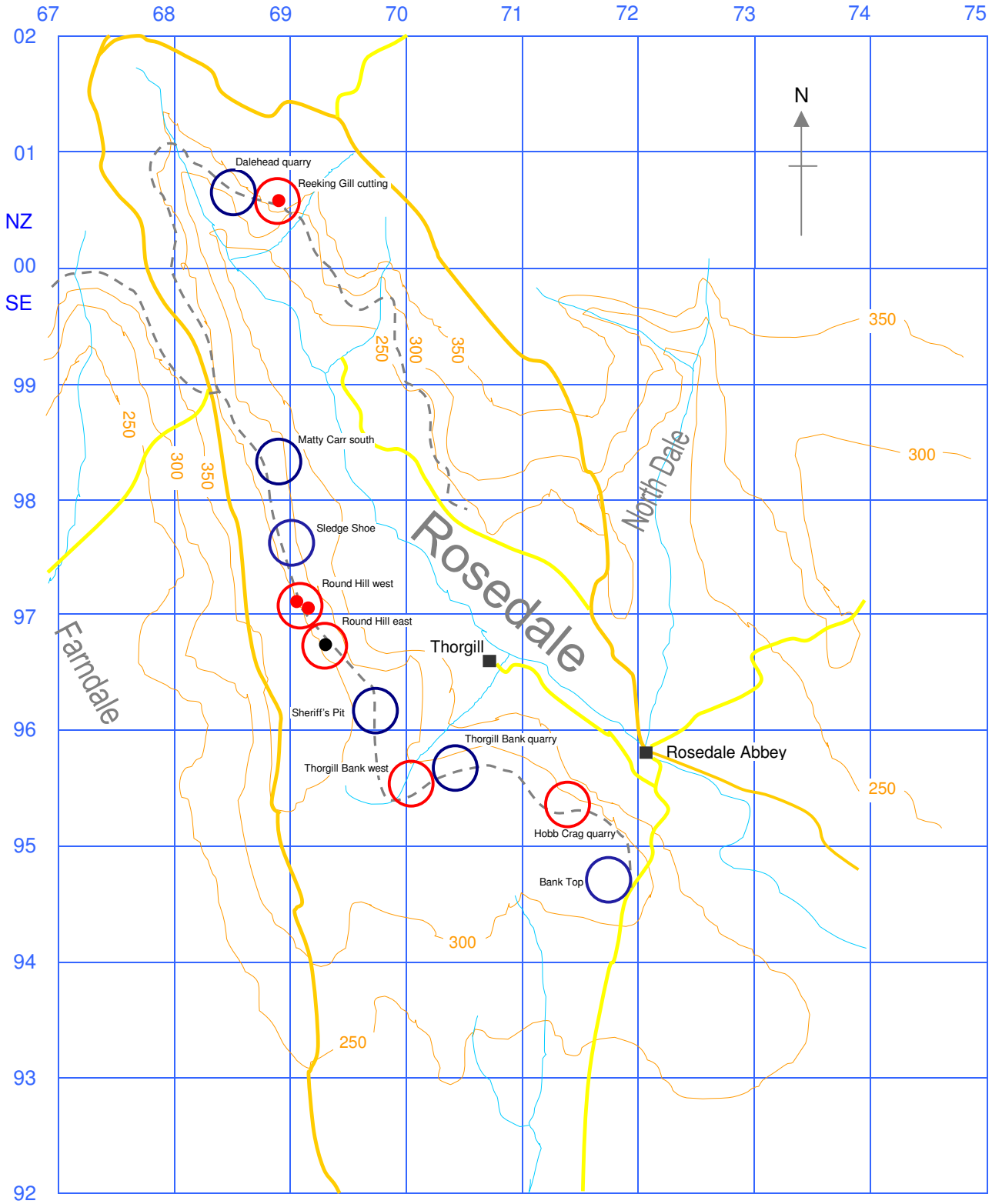
ANNEX 1 - Map of Nest Sites and Territories in the Rosedale Area in 2018



Ring Ouzel nest sites and territories located in 2018 in the Rosedale area of the North York Moors.

KEY

Nest Site
Successful ●
Predated or Abandoned ●

Territory
Confirmed ○
Probable ○

ANNEX 2 - Map of Sightings on the North York Moors in 2018

(Other than the Rosedale area & passage migrants)

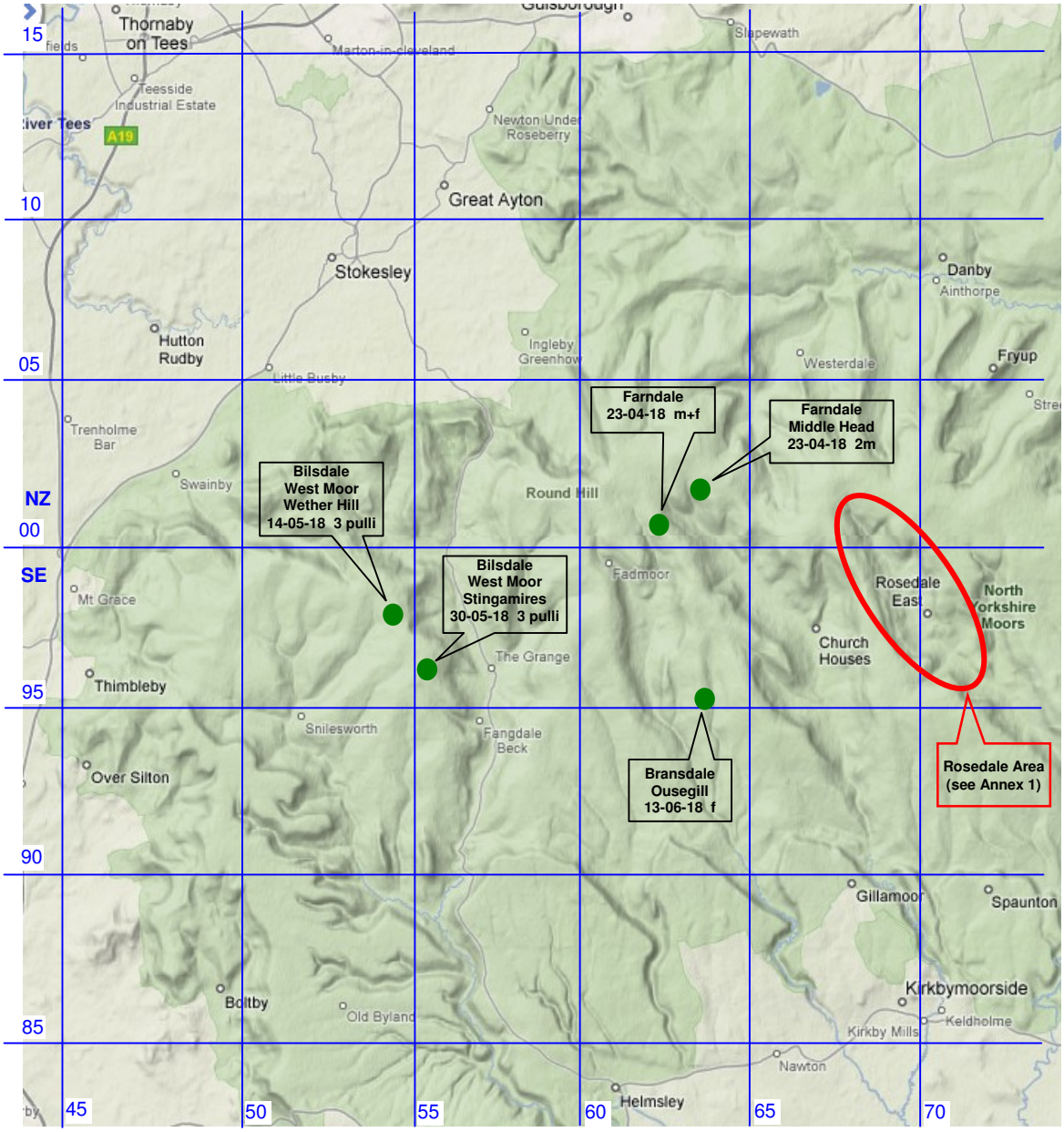


Diagram 1: Sightings of Ring Ouzels on the North York Moors in 2018 other than the Rosedale area and passage migrants.

ANNEX 3 - Table of Annual Breeding Results from 2000 to 2018

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 2018.

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.
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.

Year	Site	Grid Ref.	Eggs	Hatched	Fledged	Comments
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.
2015	Spindle Thorn	SE71319320	4	4	4	1st nest. 4 pulli just hatched 25/5. Likely fledged 5/6.
2015	Bank Top	SE71799497	4	1	0	1st nest. 1 pullus & 3 eggs on 12/5. Found predated 20/5.
2015	Bank Top	SE71749480	(3)	3	3	Replacement nest. 3 pulli on 16/6 at 9days. Fledged 19/6.
2015	Hob Crag quarry	SE71429536	4	?	0	1st nest. 4 eggs 12/5. Found predated 20/5.
2015	Hob Crag north	SE71239558	4	0	0	1st nest. 4 eggs 12/5. 4 eggs 20/5 & nest abandoned.
2015	Thorgill Bank quarry	SE70749586	4	0	0	1st nest. 1 egg 8/5, 4 eggs 12/5. Found predated 22/5.
2015	Thorgill Bank west	SE70549571	4	4	4	Replacement nest for TB quarry. 4 pulli 3 days 6/6. Fledged 19/6.
2015	Sheriff's Pit	SE69739627	(4)	4	3	1st nest. 4 seen 22/5, 3 seen 26/5 about to fledge.
2015	Round Hill east	SE69419681	4	3	0	1st nest. 3 pulli & 1 egg on 12/5. Found predated 20/5.
2015	Blakey Lion south	SE68209960	3	0	0	1st nest. 3 eggs removed from nest. Nest predated.
2015	Reeking Gill	NZ69210076	4	1	1	1st nest. 4 eggs 11/5. 1 pullus no eggs 20/5. Likely fledged 26/5.
2015	Reeking Gill	NZ69120066	4	4	4	2nd nest. 4 eggs 9/6. 1 hatch 3 eggs 15/6. Likely fledged 29/5.
2015	Nab Scar north	SE69449997	3	2	2	1st nest. 3 eggs 11/5. 2 pulli no egg 20/5. Likely fledged 27/5.
2015	Round Hill west	SE69249709	+	+	3	1st nest. 3 juvs being fed by adults 26/5. Likely fledged 26/5.
2015	Bank Top east	SE72--94--	+	+	3	Fledglings seen being fed by Adults 9/6 & 16/6.
2016	Bank Top	SE72039473	4	0	0	1st nest. Predated.
2016	Bank Top	SE71899471	+	+	2	2nd (replacement) 2 fledglings seen being fed by Adults
2016	Hob Crag	SE71259544	+	+	2	1st nest. 2 fledglings seen being fed by Adults
2016	Thorgill Bank quarry	SE70729581	4	3	1	1st nest. 1 fledgling seen being fed by Adult.
2016	Sheriff's Pit	SE69739627	(3)	3	3	1st nest.
2016	Sheriff's Pit	SE69739627	(3)	3	3	2nd nest.
2016	Round Hill south	SE69699673	+	+	(3)	1st nest. 1 fledgling seen being fed by Adults 7/6.
2016	Round Hill south	SE69699673	+	+	(2)	2nd nest. 2 fledgling seen being fed by Adults 2/7.
2016	Round Hill east	SE69419681	4	4	0	1st nest.
2016	Matty Carr quarry	SE68809838	4	(0)	0	1st nest. Predated.
2016	Matty Carr quarry	SE688-983-	(3)	(3)	3	2nd nest (replacement). 3 fledglings seen being fed by Adults
2016	Thorgill west	SE701-955-	(3)	(3)	3	1st nest. Male & 3 fledglings flying strong around T.west area.
2016	Sledge Shoe	SE690-976-	(3)	(3)	3	2nd nest. 3 fledglings seen being fed by Adults
2017	Round Hill west	SE69259704	3	2	2	2nd nest. One egg infertile.
2017	Thorgill Bank east	SE70939583	4	4	4	1st nest. New territory.
2017	Sheriff's Pit north 1.	SE69669645	4	4	0	1st nest. Predated at chick stage.
2017	Sheriff's Pit north 2.	SE69709642	(4)	4	4	2nd nest (replacement).
2017	Hob Crag north	SE71219559	4	4	4	1st nest. Refurbished 2015 nest.
2017	Hob Crag west	SE71139530	4	0	0	2nd nest. Eggs smashed. Likely been trampled.
2017	Matty Carr west	SE68709833	(4)	4	4	1st nest.
2017	Dalehead west	NZ67900080	(3)	(3)	3	1st nest.
2017	Loskey Side	SE70809330	4	4	4	2nd nest.
2017	Reeking Gill	NZ69200080	5	5	0	2nd nest. Likely perished during prolonged rain on 08-09/6.
2017	Sturdy Bank	SE69869996	2	0	0	1st nest. Predated at egg stage. Not known if clutch completed.
2017	High Blakey Moor - Farndale	SE65859985	4	(2)	2	1st nest. Located 01/05. Likely just 2 eggs hatched.
2018	Round Hill east	SE69449672	4	3	0	1st nest. Most likely predated at chick stage.
2018	Round Hill west	SE69249707	4	3	2	1st nest. 2 fledged at 12 days.
2018	Round Hill west	SE69289705	4	4	3	2nd nest 3 fledged at 12 days.
2018	Reeking Gill cutting	NZ68860067	4	4	4	1st nest.
2018	Ousegill - Bransdale	SE63979470	(3)	3	(3)	2nd nest

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

ANNEX 4 - Table of Nest Aspect and Elevation from 1999 to 2018

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

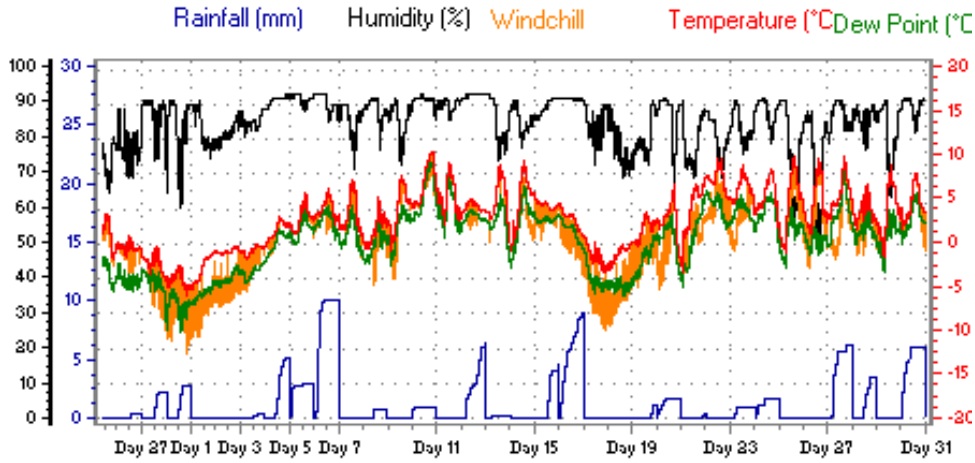
Year	Location	Grid Reference	Aspect	Elevation
2012	Rosedale - Sheriff's Pit (north)	SE 6968 9643	N	343m
2012	Rosedale – Round Hill (south)	SE 6944 9670	NW	350m
2012	Rosedale - Dalehead (west)	NZ 6794 0080	SW	347m
2012	Rosedale - Reeking Gill cutting	NZ 6881 0067	S	328m
2012	Rosedale - Reeking Gill	NZ 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	SE 6926 9706	NE	350m
2014	Rosedale west - Round Hill west 2nd	SE 6924 9709	E	351m
2014	Rosedale west - Round Hill east	SE 6941 9681	NE	339m
2014	Rosedale west - Blakey Lion south	SE 6826 9954	E	369m
2014	Rosedale west - Hob Crag quarry	SE 7137 9543	NE	304m
2014	Rosedale west - Thorgill Bank	SE 7073 9582	E	308m
2014	Rosedale west - Thorgill Head	SE 6990 9568	WSW	331m
2014	Rosedale west - Matty Carr quarry	SE 6880 9836	W	327m
2014	Rosedale west - Spindle Thorn	SE 7131 9313	NW	218m
2014	Rosedale west - Sheriff's Pit 1st	SE 6980 9625	E	337m
2014	Rosedale west - Sheriff's Pit 2nd	SE 6973 9627	NNE	340m (ground level 343m)
2014	Rosedale east - Reeking Gill west	NZ 6903 0069	S	318m
2014	Rosedale east - Reeking Gill quarry	NZ 6917 0053	S	310m
2014	Rosedale east - Reeking Gill south	NZ 6928 0044	WSW	358m
2014	Rosedale east - Reeking Gill	NZ 9162 0066	SW	307m
2014	Rosedale east - Nab Scar south	SE 6952 9986	SSW	332m
2014	Farndale east - Breckon Bank	SE 6869 9508	SSW	315m
2014	Farndale east - High Blakey Moor	SE 6667 9945	SSE	373m
2014	Esklets east - Esklets Crags south	NZ 6625 0159	SW	309m
2014	Esklets east - Esklets Crags north	NZ 6591 0236	SW	287m
2015	Rosedale - Thorgill Bank quarry	SE 7075 9584	ENE	294m
2015	Rosedale - Thorgill Bank west	SE 7055 9572	NNW	316m
2015	Rosedale - Sheriff's Pit 1st	SE 6972 9626	SE	343m
2015	Rosedale - Spindle Thorn	SE 7131 9320	E	228m
2015	Rosedale - Bank Top 1st	SE 7179 9497	SSE	321m
2015	Rosedale - Bank Top 2nd (replacement)	SE 7174 9480	NE	321m
2015	Rosedale - Round Hill east	SE 6941 9681	NE	339m
2015	Rosedale - Hob Crag	SE 7142 9536	NE	315m
2015	Rosedale - Hob Crag north	SE 7123 9558	SW	315m
2015	Rosedale - Blakey Lion south	SE 6823 9960	NE	363m
2015	Rosedale - Reeking Gill 1st	NZ 6924 0079	S	358m
2015	Rosedale - Reeking Gill 2nd	NZ 6913 0065	SW	304m
2015	Rosedale - Nab Scar north	SE 6944 0001	W	343m
2016	Rosedale - Bank Top	SE 7203 9473	ENE	331m
2016	Rosedale - Thorgill Bank quarry	SE 7072 9581	E	300m
2016	Rosedale - Sheriff's Pit 1st	SE 6972 9626	SE	343m
2016	Rosedale - Sheriff's Pit 2h	SE 6972 9626	SE	343m
2016	Rosedale - Round Hill east	SE 6941 9681	NE	339m
2016	Rosedale - Matty Carr quarry	SE 6880 9838	E	335m
2017	Rosedale - Matty Carr west	SE 6870 9833	E	362m
2017	Rosedale - Round Hill west	SE 6925 9704	N	347m
2017	Rosedale - Sheriff's Pit north 1st	SE 6966 9645	NNE	341m
2017	Rosedale - Sheriff's Pit north 2nd	SE 6970 9642	N	339m
2017	Rosedale - Sturdy Bank	SE 6986 9996	S	299m
2017	Rosedale - Loskey Side	SE 7080 9330	W	241m
2017	Rosedale - Reeking Gill	NZ 6920 0080	W	364m
2017	Rosedale - Dalehead west	NZ 6790 0080	E	366m
2018	Rosedale - Reeking Gill cutting	NZ 6886 0067	SSE	327m
2018	Rosedale - Round Hill east	SE 6944 9672	NNE	348m
2018	Rosedale - Round Hill west 1st	SE 6924 9707	NE	350m
2018	Rosedale - Round Hill west 2nd	SE 6928 9705	W	346m
2018	Bransdale - Ousegill Bridge	SE 6397 9470	W	241m

ANNEX 5 - Table of Late and Early Territory Occupancy from 2008 to 2018

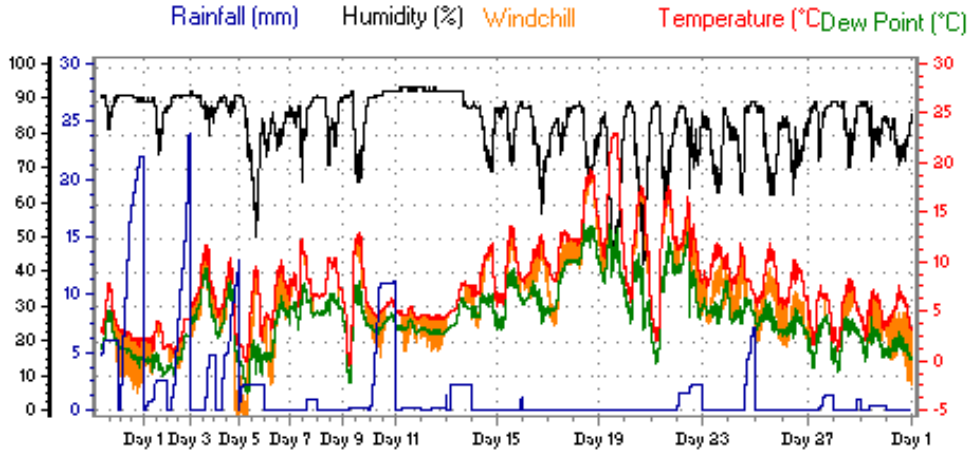
Table 1: Late and Early territory occupancy in the Rosedale area of the North York Moors from 2008 to 2018.

	2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018	
	Early	Late	Early	Late	Early	Late	Early	Late	Early	Late	Early	Late	Early	Late	Early	Late	Early	Late	Early	Late	Early	Late
Spindle Thorn (Inc. Spaunton Knowl in 2012)		✓							✓✓			✓	✓		✓		✓		✓			
Loskey Side (ford)																				✓		
Loskey Beck (area)													✓						✓			
Bank Top							✓		✓		✓		✓		✓	✓	✓	✓	✓		✓	✓
Bank Top east															✓							
Hob Crag quarry	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓✓	✓	✓		✓		✓		✓	✓
Hob Crag north										✓	✓	✓			✓	✓			✓			
Hob Crag west																				✓		
Thorgill Bank quarry							✓	✓	✓		✓	✓	✓		✓		✓				✓	
Thorgill Head													✓									
Thorgill Bank east																			✓			
Thorgill Bank west																✓	✓			✓	✓	
Sheriff's Pit	✓			✓	✓			✓		✓	✓	✓	✓	✓	✓		✓	✓			✓	
Sheriff's Pit north									✓										✓	✓		
Round Hill south	✓	✓	✓						✓		✓	✓	✓				✓	✓	✓			
Round Hill east	✓	✓	✓	✓	✓		✓		✓				✓		✓		✓				✓	✓
Round Hill west							✓		✓	✓	✓		✓	✓	✓			✓	✓	✓	✓	✓
Sledge Shoe			✓				✓			✓	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓
Matty Carr south										✓					✓						✓	
Matty Carr quarry	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓					
Matty Carr west																			✓			
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**	**14**	**10**	**17**	**9**	**18**	**12**	**20**	**6**	**15**	**6**	**11**	**6**	**14**	**7**	**11**	**6**
Occupancy	**0.54**		**0.62**		**0.64**		**0.71**		**0.53**		**0.67**		**0.30**		**0.40**		**0.54**		**0.50**		**0.54**	

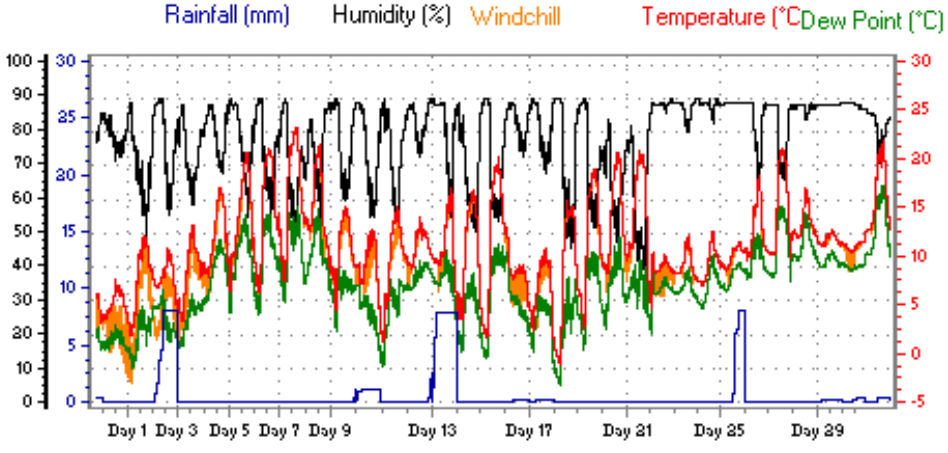
ANNEX 6 - Graphs of Daily Temperature and Rainfall for the Months March to July 2018



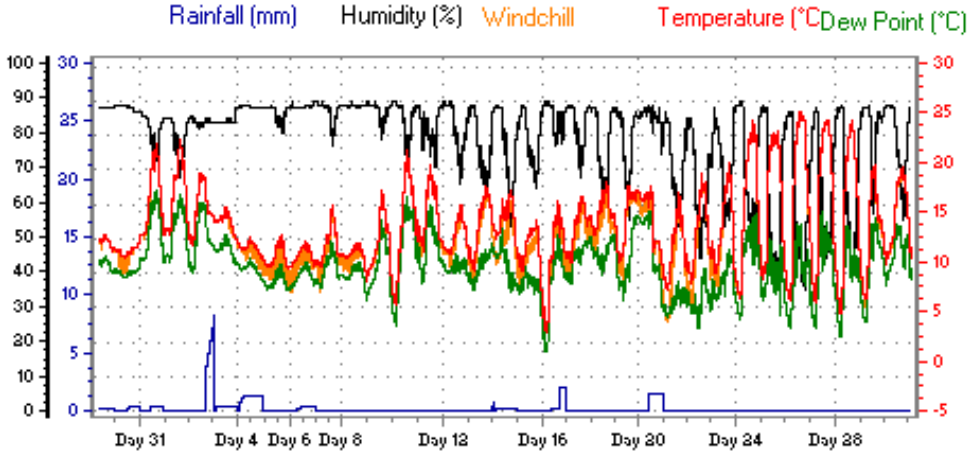
March



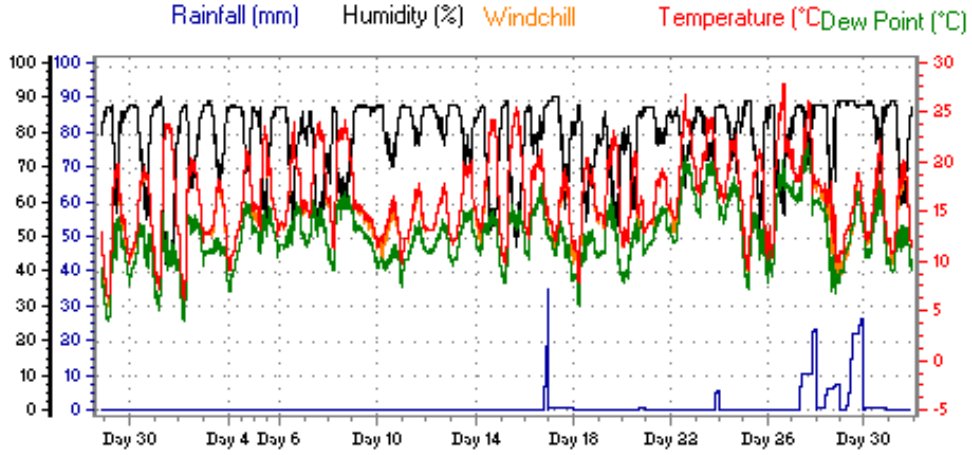
April



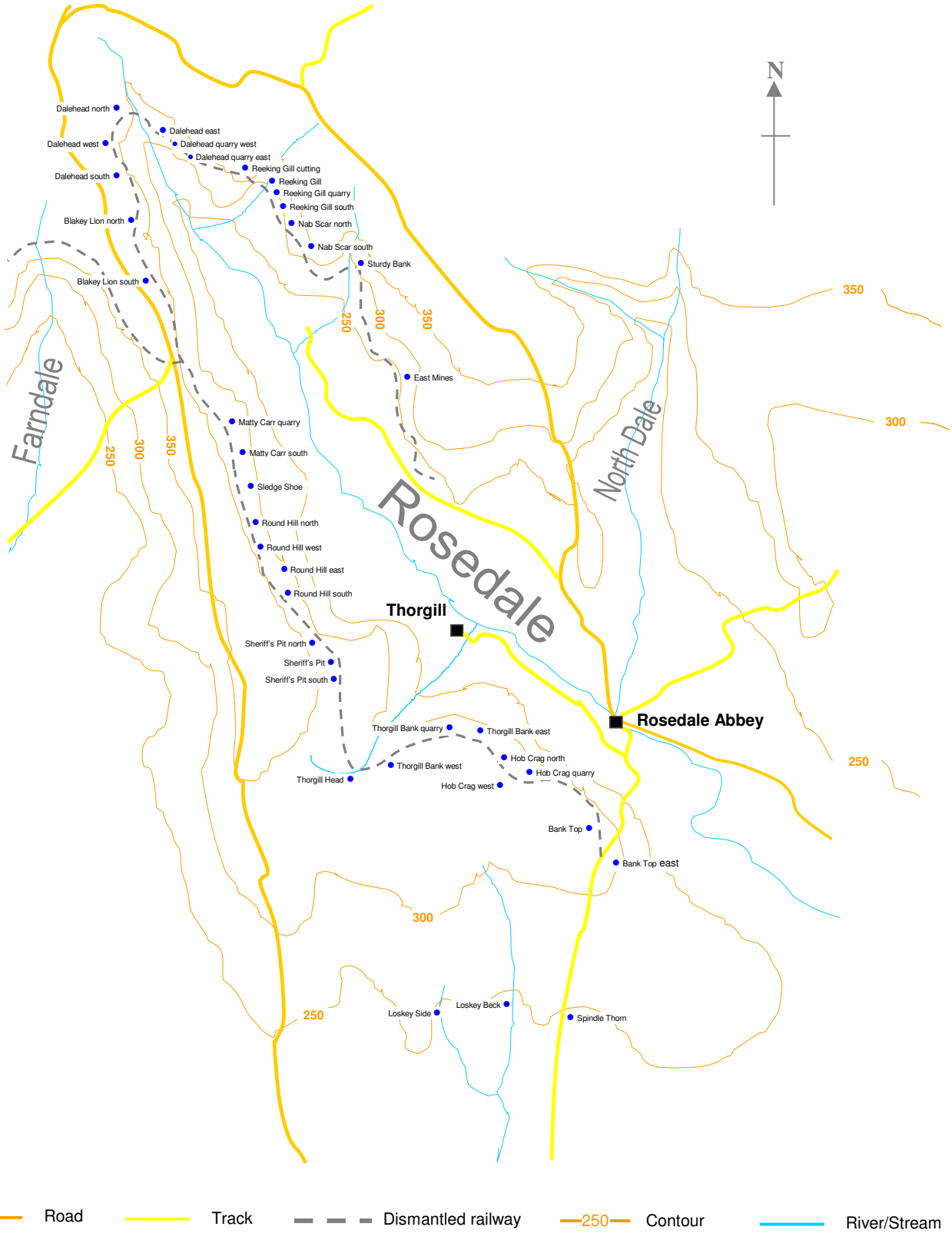
May



June



July

Daily max/min temperature & rainfall recorded at Westerdale in 2018: NZ665058, altitude 180m.

ANNEX 7 - Topographical map of the Rosedale area showing name & location of territories referred to in the report