

APPENDIX 3

BIRD TABLES

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TABLE A. Main VP summary, April 2006 to April 2007 APPENDIX 3

[Key at end]

Date	Times	Total hours	VP	Observer	Main wind	Other wind	Cloud cover & rain	No. target species detected in flight (whole survey area)													
								WS	PG	GJ	BK	BV	HH	EA	OP	ML	PE	GP	NX		
APRIL 2007																					
17-Apr-07	14:30-17:40	3.00	1	AU	NW3/4		4/8; os														
18-Apr-07	08:15-11:15	3.00	1	AU	W4/5		7/8; dry	[3]						1				1			
18-Apr-07	17:45-19:45	2.00	2	AU	W4/5		7/8; os														
21-Apr-07	08:20-10:20	2.00	3	AU	S4/5		8/8; os														
21-Apr-07	10:55-13:55	3.00	3	AU	S4/5		8/8; os				1										
		13.00						[3]	0	1	0	0	0	1	0	0	1	0	0	0	0
MAY 2007																					
07-May-07	17:15-20:15	3.00	3	AU	SW4/5	SW3	7/8; fr				2		1								1
09-May-07	10:40-12:45	2.08	1	AU	SW2-4	W2-4	6/8; os		[40]					5							
09-May-07	13:55-16:30	2.42	1	AU	SW2-4	W2-4	6/8; os						1								
11-May-07	09:30-12:30	3.00	3	AU	NE1-3		8/8; dry		[60]	10	13										
22-May-07	09:50-13:25	3.00	1	AU	SW4/5		6/8; os						1					1			
		13.50						0	[100]	10	15	0	3	5	0	0	1	1	0	1	1
JUNE 2007																					
11-Jun-07	13:00-15:00	2.00	3	AU	NE3	NE4	4/8; dry							3	1					2	
11-Jun-07	15:30-17:30	2.00	3	AU	NE3	NE4	6/8; dry													1	
11-Jun-07	18:00-20:30	2.50	3	AU	NE3	NE4	4/8; dry														
15-Jun-07	05:40-07:40	2.00	1	AU	NE2/3		6/8; dry				1									1	
15-Jun-07	08:10-10:10	2.00	1	AU	NE4		6/8; dry														
15-Jun-07	10:40-13:10	2.50	1	AU	NE4/5		4/8; dry														
		13.00						0	0	0	0	1	0	3	1	0	0	0	4	0	0
JULY 2007																					
02-Jul-07	15:00-17:00	2.00	3	AU	S3		6/8; dry							2							
02-Jul-07	17:40-20:40	3.00	3	AU	S3		5/8; dry														
04-Jul-07	06:15-09:15	3.00	1	AU	NW2/3	Var 0-2	8/8; dry													3	
04-Jul-07	10:15-13:30	3.00	1	AU	NW2/3	NW3	6/8; os					5				1					
05-Jul-07	06:00-08:30	2.50	3	AU	SW2/3		7/8; dry				3										
05-Jul-07	09:00-11:30	2.50	3	AU	SW2/3	SSW3	8/8; lr														
30-Jul-07	13:45-15:45	2.00	1	AU	W3/4		6/8; dry							1							
30-Jul-07	16:15-18:15	2.00	1	AU	W3/4		7/8; dry							3							
30-Jul-07	18:45-20:45	2.00	1	AU	W2/3		8/8; dry														
31-Jul-07	08:10-10:10	2.00	3	AU	SW4		5/8; dry													2	
		24.00						0	0	0	0	3	5	6	0	1	0	5	0	0	0
AUGUST 2007																					
01-Aug-07	08:20-10:20	2.00	1	AU	SW3	SW3/4	6/8; dry														
01-Aug-07	10:45-12:45	2.00	1	AU	SW3/4		6/8; dry							2							
01-Aug-07	13:45-16:45	3.00	1	AU	SW3/4		6/8; os							1							
02-Aug-07	05:45-08:00	2.25	3	AU	W2/3	W3	4/8; os				[2]										
02-Aug-07	08:35-10:50	2.25	3	AU	W2/3		7/8; os														
02-Aug-07	12:20-14:35	2.25	3	AU	W2	W2/3	7/8; dry							1							
02-Aug-07	15:05-17:20	2.25	3	AU	W3/4		5/8; dry							1							
20-Aug-07	08:55-11:55	3.00	1	RS	NNE3/4		8/8; dry														
20-Aug-07	12:55-15:55	3.00	1	RS	NNE3/4		6/8; dry					1									
		22.00						0	0	0	0	[2]	1	5	0	0	0	0	0	0	0
SEPTEMBER 2007																					
12-Sep-07	10:15-13:00	2.75	1	AU	W3	NW1/2	4/8; dry							1							
12-Sep-07	13:30-16:15	2.75	1	AU	W3/4		4/8; dry							1			3				
12-Sep-07	16:55-18:55	2.00	1	AU	W3		7/8; dry														
13-Sep-07	08:50-11:20	2.50	3	AU	SW5/6		7/8; dry														1
13-Sep-07	11:50-14:20	2.50	3	AU	SW5/6		8/8; dry										1				
13-Sep-07	14:50-16:50	2.00	3	AU	SW5/6		8/8; lr														
25-Sep-07	08:35-11:35	3.00	1	RS	NW5		6/8; fr							4							
25-Sep-07	12:35-15:35	3.00	1	RS	NW5		8/8; fr														
		20.50						0	24	0	0	0	0	6	0	4	0	0	0	0	1

(Continued)

TABLE A. Main VP summary, April 2006 to April 2007 APPENDIX 3

Date	Times	Total hours	VP	Observer	Main wind	Other wind	Cloud cover & rain	No. target species detected in flight (whole survey area)														
								WS	PG	GJ	BK	BV	HH	EA	OP	ML	PE	GP	NX			
OCTOBER 2007																						
01-Oct-07	08:00-11:00	3.00	1	RS	SW2		2/8; dry															
01-Oct-07	11:30-14:30	3.00	1	RS	SW2		3/8; dry						2									
21-Oct-07	09:00-11:00	2.00	1	AU	SW3		7/8; dry															
21-Oct-07	11:30-14:30	3.00	1	AU	SSW5	SW3	7/8; os															
21-Oct-07	15:10-18:10	3.00	1	AU	SSW5		8/8; dry															
22-Oct-07	07:55-10:55	3.00	3	AU	SSW3/4		8/8; dry															
22-Oct-07	11:35-14:35	3.00	3	AU	SSW3/4		7/8; os															
		20.00						0	0	0	0	0	0	2	0	0	0	0	0	0	0	
NOVEMBER 2007																						
20-Nov-07	07:55-10:35	2.33	1	AU	NE2/3		6/8; dry						1						1			
20-Nov-07	11:00-13:25	2.42	1	AU	NE2/3		6/8; dry						1									
22-Nov-07	08:30-10:45	2.25	1	AU	N4/5		7/8; os							1								
22-Nov-07	11:10-16:25	4.42	1	AU	N4/5	N3/4	7/8; fs						4									
23-Nov-07	07:40-10:00	2.33	3	AU	N2		1/8; dry															
23-Nov-07	10:25-12:25	2.00	3	AU	SW2	Var 0-1	2/8; dry				6											
23-Nov-07	12:50-14:50	2.00	3	AU	SW2/3	SW3/4																
		17.75						0	0	6	0	0	6	1	0	0	1	0	0	0	0	
DECEMBER 2007																						
14-Dec-07	08:35-10:35	2.00	1	AU	S4/5		6/8; dry						1									
14-Dec-07	11:05-13:05	2.00	1	AU	S5/6	S4/5	6/8; dry															
14-Dec-07	13:35-15:50	2.25	1	AU	S4/5	S3/4	6/8; dry															
15-Dec-07	08:20-10:20	2.00	1	AU	S5		8/8; dry						1									
15-Dec-07	10:50-12:50	2.00	1	AU	S5	S4	8/8; dry															
15-Dec-07	13:20-15:50	2.50	1	AU	S3/4		8/8; dry						1									
16-Dec-07	08:15-10:45	2.50	3	AU	S2/3		1/8; dry						1							1		
16-Dec-07	11:30-14:30	3.00	3	AU	S3/4	S4	1/8; dry															
		18.25						0	0	0	0	0	4	0	0	0	1	0	0	0	0	
JANUARY 2008																						
5-Jan-08	15:50-16:20	0.50	3	AU	SW3/4		8/8; os															
6-Jan-08	8:05-10:35	2.50	3	AU	SW3		8/8; lr				1											
6-Jan-08	11:05-13:35	2.50	3	AU	SW2/3		6/8; lr							1								
6-Jan-08	14:05-16:30	2.42	3	AU	SW2	SW1/2	3/8; dry				1	1	1									
7-Jan-08	08:20-10:55	2.58	1	AU	S2/3		2/8; dry						1									
7-Jan-08	11:25-14:25	3.00	1	AU	SW3	S3	3/8; dry						1							1		
7-Jan-08	14:55-16:24	1.17	1	AU	SW3		6/8; os															
8-Jan-08	08:52-11:20	2.33	1	AU	SE3/4		7/8; os				1	1										
8-Jan-08	11:50-14:05	2.25	1	AU	SE3		7/8; dry															
		19.25						0	0	0	2	0	4	4	0	0	1	0	0	0	0	
FEBRUARY 2008																						
19-Feb-08	14:45-17:45	3.00	3	AU	SSW3	SSW3/4	3/8; dry				3											
20-Feb-08	08:15-08:35	0.33	1	AU	SSW4/5		7/8; os															
20-Feb-08	15:00-17:40	2.67	1	AU	SW4		8/8; os															
21-Feb-08	15:10-16:40	1.00	1A	AU	SW5/6		8/8; lr															
22-Feb-08	09:55-17:14	4.50	1	AU	W6/7	SW8	6/8; fs					1								1		
23-Feb-08	12:15-13:45	1.50	3	AU	WSW5		5/8; os															
24-Feb-08	07:43-09:58	1.55	1	AU	W5		6/8; fs															
24-Feb-08	10:24-14:44	3.45	1	AU	W5	SW5	6/8; fs															
		18.00						0	0	0	3	0	0	1	0	1	0	0	0	0	0	

(Continued)

TABLE A. Main VP summary, April 2006 to April 2007 APPENDIX 3

Date	Times	Total hours	VP	Observer	Main wind	Other wind	Cloud cover & rain	No. target species detected in flight (whole survey area)													
								WS	PG	GJ	BK	BV	HH	EA	OP	ML	PE	GP	NX		
MARCH 2008																					
17-Mar-08	12:30-15:00	2.50	3	AU	N3/4		7/8; dry							2							
17-Mar-08	15:45-18:45	3.00	3	AU	N3	N4	7/8; os							1							
18-Mar-08	07:25-09:55	2.50	1	AU	NNW2/3	NNW1/2	6/8; os														
18-Mar-08	10:35-13:05	2.50	1	AU	NNW3		7/8; os														
18-Mar-08	13:45-15:45	2.00	1	AU	NNW3	N2	5/8; dry				1										
18-Mar-08	16:15-18:15	2.00	1	AU	NNW2/3	NNW3/4	3/8; dry					1									
19-Mar-08	08:20-10:50	2.50	1	AU	NW3	NW2/3	4/8; dry														
19-Mar-08	11:30-14:30	3.00	1	AU	WNW2/3	WNW1/2	7/8; fs													2	
		20.00						0	0	0	0	0	1	4	0	0	0	0	2	0	0
APRIL 2008																					
11-Apr-08	10:50-13:50	3.00	1	RS	SE1/2		6/8; dry		150					1			1				
11-Apr-08	14:50-17:50	3.00	1	RS	SE1/2		6/8; dry														
22-Apr-08	17:15-20:15	3.00	3	AU	SE2/3	SE3/4	6/8; dry														
23-Apr-08	05:35-7:35	2.00	1	AU	SE1/2		8/8; dry													2	
23-Apr-08	08:05-10:05	2.00	1	AU	SE3		8/8; lr													2	
		13.00						0	150	0	0	0	0	1	0	1	0	4	0	4	0
MAY 2008																					
13-May-08	16:25-19:25	3.00	3	AU	E3/4		0/8						1								
14-May-08	08:25-10:55	2.50	1	AU	NE2/3		4/8; dry				1									1	
14-May-08	11:25-13:55	2.50	1	AU	NE3		1/8; dry														
14-May-08	14:50-16:50	2.00	1	AU	NE3		0/8													2	
14-May-08	19:45-21:45	2.00	3	AU	NE3		2/8; dry														
		12.00						0	0	0	0	1	0	1	0	0	0	3	0	0	0
JUNE 2008								WS	PG	GJ	BK	BV	HH	EA	OP	ML	PE	GP	NX		
4-Jun-08	08:50-11:50	3.00	1	RS	S2		3/8; dry														
4-Jun-08	12:50-15:50	3.00	1	RS	S4		3/8; dry						1								
7-Jun-08	05:50-07:50	2.00	1	AU	E0/1	E1/2	7/8; dry									1				1	
7-Jun-08	08:20-10:20	2.00	1	AU	E1-3		8/8; dry													8	
8-Jun-08	17:55-20:55	3.00	3	AU	SW5		8/8; os														
		13.00						0	0	0	0	0	0	1	0	1	0	9	0	0	0
JULY 2008																					
11-Jul-08	18:45-21:45	3.00	1	AU	NW3		7/8; os														
15-Jul-08	17:30-20:30	3.00	3	AU	W5		7/8; os														
28-Jul-08	10:05-13:05	3.00	1	RS	E1/2		1/8; dry													1	
28-Jul-08	14:05-17:05	3.00	1	RS	E1/2		1/8; dry														
		12.00						0	0	0	0	0	0	0	0	0	0	1	0	0	0
AUGUST 2008																					
14-Aug-08	09:20-12:20	3.00	1	RS	SE2		2/8; dry										1				
14-Aug-08	13:20-16:20	3.00	1	RS	SE2		2/8; dry														
26-Aug-08	16:10-18:10	2.00	3	AU	SW3/4		8/8; os														
26-Aug-08	18:30-20:40	2.00	3	AU	SW3	SW1/2	8/8; os				1										
27-Aug-08	07:55-10:55	3.00	1	AU	W4/5	W5/6	7/8; dry														
		13.00						0	0	0	1	0	0	0	0	1	0	0	0	0	0
TOTALS		282.25						0	174	17	21	5	24	41	1	9	6	27	2		
								+[3] +[100]		+[2]											

- | | | | | | |
|----|----------------------|----|---------------|-------------|--|
| WS | Whooper Swan | EA | Golden Eagle | os | occasional short and/or light showers |
| PG | Pink-footed Goose | OP | Osprey | fs | frequent showers |
| GJ | Greylag Goose | ML | Merlin | lr | more extended light rain (never for whole watch) |
| BK | Black Grouse | PE | Peregrine | 08:24-10:44 | watch broken up e.g. by rain/low cloud |
| BV | Black-throated Diver | GP | Golden Plover | AU | Andrew Upton |
| HH | Hen Harrier | NX | Great Skua | RS | Bob Swann |

TABLE B.

Close-up VP summary, April to July 2007

APPENDIX 3

Date	Times	Total hours	VP	Observer	Main wind	Other wind	Cloud cover & rain	No. target species detected in flight (whole survey area)													
								WS	PG	GJ	BK	BV	HH	EA	OP	ML	PE	GP	NX		
17-Apr-07	18:40-20:40	2.00	A	AU	W2/3		6/8; os														
18-Apr-07	12:30-14:30	2.00	A	AU	W4/5		6/8; lr														
20-Apr-07	09:15-11:15	2.00	B	AU	N1/2	SW2/3	8/8; dry													1	
8-May-07	18:30-20:45	2.25	B	AU	SW2/3		7/8; lr						1							3	
9-May-07	18:10-20:25	2.25	C	AU	NE2/3	SW0-2	8/8; dry														
22-May-07	06:55-08:55	2.00	C	AU	SW3/4		6/8; os														
14-Jun-07	05:45-07:45	2.00	C	AU	NE3/4		4/8; dry														
14-Jun-07	17:40-19:55	2.25	C	AU	NE4/5		2/8; dry					1								1	
15-Jun-07	13:40-15:40	2.00	C	AU	NW5		4/8; dry														
4-Jul-07	16:50-19:50	3.00	C	AU	W3/4		6/8; dry														
TOTALS		21.75						0	0	0	0	0	0	1	1	0	0	0	0	5	0

WS *Whooper Swan*PG *Pink-footed Goose*GJ *Greylag Goose*BK *Black Grouse*BV *Black-throated Diver*HH *Hen Harrier*EA *Golden Eagle*OP *Osprey*ML *Merlin*PE *Peregrine*GP *Golden Plover*NX *Great Skua*os *occasional short and/or light showers*fs *frequent showers*lr *more extended light rain (never for whole watch)*AU *Andrew Upton*

TABLE C. *Dates and times for Brown & Shepherd surveys and point counts.*

Visit	Dates, times and conditions	Area covered
2007		
A	19/04/07 – 10:40-18:45; NW to NE up to F4, 4/8, dry 20/04/07 – 06:43-08:45; N 1, 8/8, dry 20/04/07 – 12:15-19:45; SW 3-4, 8/8, dry 07/05/07 – 12:40-16:25; SW 4, 6/8, dry	L Comhnard south to sheepfolds & E side of Enrick. Point counts. Turbine area. RSPB land N from L Comhnard.
B	08/05/07 – 09:15-18:15; SW 3-4, 6/8, occ showers	Turbine area.
C	12/06/07 – 09:30-18:00; NE 3, 8/8, drizzle from 16:20 13/06/07 – 11:45-18:25; NE 3-4, 8/8, dry 14/06/07 – 09:30-17:20; NE 4-5, 4/8, dry 16/06/07 – 05:45-07:45; NE 3-4; 8/8; light showers	RSPB land N from L Comhnard. L Comhnard S to grouse butts. Turbine area. Point counts.
2008		
A	12/05/08 – 13:30-20:50; NE 3-4, 6/8, dry 12/05/08 – 20:55-21:25; NE 3-4, 6/8, dry 13/05/08 – 08:35-09:00; NE 3, 8/8, dry 13/05/08 – 09:00-13:45; NE 3, to 0/8, dry	SE part of cable route Point counts, SE cable route Point counts, NW cable route NW part of cable route
B	10/06/08 – 05:15-08:15; SW 5, 8/8, occ drizzle 10/06/08 – 15:00-20:45; SW 5-6, 7/8, rain from 20:30 10/06/08 – 21:00-21:30; SW 3, 7/8, rain to 21:20 11/06/08 – 07:55-08:30; W 3, 4/8, dry 11/06/08 – 09:00-17:00; W 3, 6/8, mostly dry 12/06/08 – 05:30-07:45; light wind, dry & 09:00-09:45	Lower access (incl point counts) NW part of cable route Point counts, NW cable route Point counts, SE cable route SE part of cable route Lower access (incl point counts)

TABLE Di. *Brown & Shepherd survey results 2007.*

(Numbers given are the number of pairs plus individuals for most species, or the total number of individuals for Woodpigeon and Crossbill. Point count numbers are the summed totals from each point, after adjustment for probable duplication of records between points).

2007 Visit:	OPEN GROUND & WATERSIDE SPECIES								Approx totals	
	Turbine area			Enrick		E RSPB		Point counts		
	A	B	C	A	C	A	C	A		C
Greylag Goose						1-2	1			1-2
Teal						1	1			1
Mallard						1	1			1
Red Grouse	3	3	3		2	1				6
Little Grebe						1	1			1
Golden Plover		2	2							2
Lapwing				2	2					2
Snipe		6-7	4	1	1		3-4			10-12
Curlew				2	2					2
Common Spiper			1	1	2-3	1	1			4-5
Greenshank						1	1			1
Redshank						1				1
Skylark	6	25	31	7	10	3	4			45
Meadow Pipit	51	67	108	35	56	24	53	1		218
Grey Wagtail			1	1	2					3
Pied Wagtail				2	1					2
Whinchat				1						1
Stonechat	2	3	3	2	3	2	4			10
Wheatear		2		2	2					4
Hooded Crow					1					1
Reed Bunting						1	2-3			2-3

TABLE Dii. *Brown & Shepherd survey results 2007.*

(Numbers given are the number of pairs plus individuals for most species, or the total number of individuals for Woodpigeon and Crossbill. Point count numbers are the summed totals from each point, after adjustment for probable duplication of records between points).

2007 Visit:	SCRUB & WOODLAND SPECIES								Approx totals	
	Turbine area			Enrick		E RSPB		Point counts		
	A	B	C	A	C	A	C	A		C
Woodpigeon								3		3
Cuckoo					1			1		2
Wryneck					1					1
Tree Pipit				2-3	1	4	1			6-7
Wren		1	3	5	3	12	14	8	5	30
Dunnock								8	5	8
Robin								3	4	4
Song Thrush					1			3	2	4
Mistle Thrush				2	2					2
Willow Warbler			1	5	9	7	19	2	18	47
Goldcrest								2	2	2
Spotted Flycatcher					1			1		2
Blue Tit				2	2			1		3
Great Tit					1					1
Coal Tit					1			6	1	7
Chaffinch	1		2	9	9	5	9	10	4	30
Siskin					1					1
Redpoll					1					1
Crossbill sp.									2 over	2
Bullfinch					1					1

TABLE Ei

Brown & Shepherd survey results 2008.

(Numbers given are the number of pairs plus individuals for most species. Point count numbers are the summed totals from each point, after adjustment for probable duplication of records between points for species with far-carrying song e.g. Cuckoo, Song Thrush).

2008 Visit:	OPEN GROUND & WATERSIDE SPECIES												Approx totals				
	Mid RSPB		W RSPB		Kerrow		SE point counts		NW point counts		Lower Access			RSPB point counts		Informal point counts	
	A	B	A	B	A	B	A	B	A	B	B1	B2		B1	B2	B1	B2
Mallard	1		1														2
Teal	1-4																1-4
Red Grouse	2																2
Oystercatcher											1						1
Snipe						1											1
Skylark	4	2	2	6	4	2											14
Meadow Pipit	17	30	24	37	14	26											93
Grey Wagtail											1	1					1
Pied Wagtail					1						1	2			1		3
Whinchat	3	4															4
Stonechat	4	2	5	2	2	1											11
Hooded Crow						1			1	1	1		1				4

TABLE Eii

Brown & Shepherd survey results 2008.

(Numbers given are the number of pairs plus individuals for most species. Point count numbers are the summed totals from each point, after adjustment for probable duplication of records between points for species with far-carrying song e.g. Cuckoo, Song Thrush).

2008 Visit:	SCRUB, WOODLAND & GARDEN SPECIES											Approx totals					
	Mid RSPB		W RSPB		Kerrow		SE point counts		NW point counts		Lower Access		RSPB point counts		Informal point counts		
	A	B	A	B	A	B	A	B	A	B	B1		B2	B1	B2	B1	B2
Sparrowhawk		1												1			2
Woodcock						1											1
Woodpigeon									1		4	4					5 ind
Cuckoo	3	1	1			1	1							1			7
GS Woodpecker						1							1	2-3			3-4
Swallow															1		1
House Martin															1	1	1
Tree Pipit			2	2	6	6											8
Wren	9	12	2	3	4	2		3	2	2	1	4	9	3	3		36
Duncock											1					1	2
Robin	8	4	1	1	2	2	9	8	3		1	1	3	6	1	1	31
Redstart											1		1		1	2	3-4
Blackbird															1	2	2
Song Thrush					1	1	3		3	1		2	1	2	2	1	13
[Redwing]															[1]	[1]	[1]
Mistle Thrush					3	2								1		1	5

Continued

TABLE Eii continuation

2008 Visit:	SCRUB, WOODLAND & GARDEN SPECIES												Approx totals				
	Mid RSPB		W RSPB		Kerrow		SE point counts		NW point counts		Lower Access			RSPB point counts		Informal point counts	
	A	B	A	B	A	B	A	B	A	B	B1	B2		B1	B2	B1	B2
Blackcap											1				2	1	3
Wood Warbler			1		2												3
Willow Warbler	27	35	14	12	15	19	7	12	5	1	2	3	2	1	2	1	92
Goldcrest	1	1							1	2			1				4
Spotted Flycat.												3		1	1		5
Blue Tit			1		3	2			1			1	2	1	2	1	10
Great Tit			1		3									3			7
Coal Tit	2	5		1	2			2	2				7	3		1	20
Treecreeper											1			2		1	4
Jackdaw															1	3	3
Starling												1			1		2
House Sparrow															1	2+	2+
Chaffinch	8	5	8	9	15	11	5	4	4	2	11	9	11	13	2	5	70
Greenfinch															1		1
Goldfinch											1	1					1
Siskin	3	2			2						1	3	2	2	1	1	11
Redpoll	2	2									1						3
Crossbill sp.	1												12over	17over			1

TABLE F. *Raptor visit details & summary results 2007.*

Visit date	Surv-eyor	Time spent on ground	Weather conditions	Area covered and VP hours undertaken	Numbers of sightings
19/04/07	RS	08:00-17:30	Moderate NW wind; morning cloudy with heavy showers, afternoon drier & sunnier.	Eastern side of area.	1 Golden Eagle, 1 Osprey (heard only), 1 Kestrel.
20/04/07	RS	07:30-17:30	Light winds at start, freshening from S thro day; 8/8 cloud all day, dry.	South and southwest parts of area including forestry along Abhainn na Ruighe Duibhe.	2 Hen Harriers, 1 Buzzard, 2 Merlins, 1 Peregrine.
22/04/07	RS	07:30-17:00	Moderate SW wind; cloud 8/8 all day; dry.	Northwest part of area (RSPB reserve).	1 Hen Harrier, 1 Merlin.
26/04/07	RS	07:30-17:30	Light SE wind; bright, sunny & dry.	Centre of area; four VP watches totalling 7.5 hours.	3 Buzzards, 1 Long-eared Owl.
10/05/07	AU	08:00-19:00	Cloudy all day with light rain from 14:00	Southeast part; one VP watch of 4 hours & pluck searches.	<i>No raptors seen.</i>
21/05/07	RS/AU	07:00-19:30	SW 3 up to SW 5; cloud 3/8 to 6/8, mostly dry.	Northwest section (RSPB) & likely Merlin gully; four VP watches totalling 10.25 hours.	1 Hen Harrier, 1 Sparrowhawk, 1 Buzzard, 2 Golden Eagles.
22/05/07	AU	14:30-19:30	SW 4; cloud 6/8 with occasional showers.	Northeast side.	1 Merlin.
23/05/07	AU	13:30-21:00	SW 5 to SW 4; cloud 4/8, high and breaking up; dry.	West side, including forestry; one VP watch of 3 hours.	1 Buzzard.
24/05/07	AU	19:30-14:30	SW 3; cloud 8/8; very light to light rain.	Northwest slopes of Suidhe Ghuirmain; one VP watch of 2 hours.	1 Buzzard.
21/06/07	RS	08:15-c17:00	NE 1 to NE 3; cloud 8/8, mostly dry. Cloud base at 300m up to 11:00 and after 16:00.	South and central areas; two VP watches totalling 4.5 hours.	1 Merlin.
22/06/07	RS	08:15-c17:00	NE 1; cloud 8/8 at less than 300m with drizzle up to 10:00.	Northwest RSPB reserve and Merlin gully, two VP watches totalling 4.25 hours & pluck searches.	<i>No raptors seen.</i>
26/06/07	RS	08:15-17:30	NW 4; cloud 3/8, sunny & dry.	East side including two VP watches totalling 4 hours.	1 Buzzard, 5 Golden Eagles, 1 Merlin.
15/07/07	RS	c08:15-c18:00	SW 3; cloud 3/8; dry.	Northeast side and Suidhe Ghuirmain, including four VP watches totalling 6.25 hrs.	1 Red Kite, 1 Goshawk, 2 Golden Eagles, 1 Kestrel
Year totals				1 Red Kite, 4 Hen Harriers, 1 Goshawk, 1 Sparrowhawk, 8 Buzzards, 10 Golden Eagles, 1 Osprey, 2 Kestrels, 6 Merlins, 1 Peregrine, 1 Long-eared Owl.	

TABLE G. *Raptor visit details & summary results 2008.*

Visit date	Surv-eyor	Time spent on ground	Weather conditions	Area covered and VP hours undertaken	Numbers of sightings
15/04/08	RS	08:00-17:30	N 1; bright, clear & cool; occasional showers.	Central & northwest parts; four VP watches totalling 6 hours.	2 Buzzards, 2 Merlins.
20/04/08	RS	08:00-17:00	NE 3/4; bright, clear & cool; dry.	Northeast part; three VP watches totalling 5 hours.	2 Buzzards.
01/05/08	RS	08:00-17:00	SW 2/3; cloud 7/8 to 5/8; cool.	Central & northwest parts; three VP watches totalling 4.5 hours.	3 Buzzards, 1 Golden Eagle.
02/05/08	RS	08:00-16:30	SW 3 to SW 5; cloud 7/8 to 5/8; two heavy showers in afternoon.	Northeast part; two VP watches totalling 3 hours.	1 Buzzard, 2 Golden Eagles.
18/06/08	RS	07:30-16:30	S4-5; cloud 7/8 to 5/8; regular heavy showers in morning.	Northeast and east parts; two VP watches totalling 3.5 hours.	1 Golden Eagle.
23/06/08	RS	08:30-17:30	W 3-4; cloud 4/8 to 7/8; occasional showers in morning.	Central & northwest parts; two VP watches totalling 3.5 hours.	3 Buzzards, 1 Osprey, 1 Kestrel, 1 Peregrine.
Year totals				11 Buzzards, 4 Golden Eagles, 1 Osprey, 1 Kestrel, 2 Merlins, 1 Peregrine.	

TABLE H. RED KITE

Flight no.	Vantage point used	Date	Time	Wind direction	Bird details	Approx flight time in view (mins)	Height at detection	Flying within 500m?	Flying within 200m risk zone?	Distance at risk (m)	Comments
2007											
A	RS	15-Jul	13:24	NE	ad	sev		n			drifting N and E over Balmacaan Forest, to E of Suidhe Ghuirmain ridge & beyond coverage of flight path maps

TABLE I. HEN HARRIER

Flight no.	Vantage point used	Date	Time	Wind direction	Bird details	Approx flight time in view (mins)	Height at detection	Flying within 500m?	Flying within 200m risk zone?	Distance at risk (m)	Comments
2007											
A	RS	20-Apr	14:26	S	m		<20	y	y	0	hunting low along slope below spur, then gaining height away N over forestry
B	RS	20-Apr	15:50	S	m		low	n			stayed low & soon out of sight
C	RS	22-Apr	13:18	SW	m			n			hunting
1	3	7-May	17:35	SW	m	1	<10	n			hunting low
2	1	9-May	16:30	SW	m	1	<10	n			hunting low
D	break	9-May	16:55	SW	m		<10	y	y	0	hunting low, then very low across spur
E	RS	21-May	09:05	SW	m			n			hunting - caught prey & away W
3	1	22-May	11:34	SW	m	6	<10	n			hunting at <20m; much hanging into wind
F	close up	14-Jun	18:30	NE	f		20-50	y	y	550	flew lower towards close-up VP, then veered away sharply & up to 20-50m when she saw me, gliding down to <20m to W
4	1	4-Jul	11:30	NW	ringtail	<<1	<20	y	n		very brief glimpse above skyline
5	1	4-Jul	12:12	NW	ringtail	3	<20	y	y	60	height difficult to tell since beyond skyline, but presumably at 20m or more over far slope
6	1	4-Jul	12:21	NW	ringtail	4	50-100	y	y	1590	shallow, direct glide down to W side of spur, where still at 20m or more as ground falls away
7	1	4-Jul	12:27	NW	1st yr m	12	20-50	y	y	3600	Flying above and ahead of no. 8 for most of the time, with some swooping at each other where circling at the end of the spur and whilst crossing E towards VP. At >20m for whole time.
8	1	4-Jul	12:27	NW	f	11	<20	y	y	3040	circling and hanging below no. 7 at first and losing height along spur so that <20m for a short way
9	1	20-Aug	12:31	NNE	ringtail	2	20-100	y	n		mobbed a Buzzard twice; low around knoll in between - at less than rotor height throughout
10	1	20-Nov	10:26	NE	ringtail	7	<10	y	y	0	low & direct at first; linked up with a Buzzard to E of Sliabh an Ruighe Duibh, circling with it and flying at it once. Variable height, but <20m within risk zone
11	1	20-Nov	11:17	NE	ringtail	5	50-100	y	y	750	level across to hilltop, circling up and shallow glide away; lost in cloud bank to W when at 50-100m above spur level, then picked up again beyond spur

Continued

KEY: Flight observed outside of timed VP watches (therefore not counted in collision risk workings)

RS = raptor search

TABLE I. HEN HARRIER (ctd)

Flight no.	Vantage point used	Date	Time	Wind direction	Bird details	Approx flight time in view (mins)	Height at detection	Flying within 500m?	Flying within 200m risk zone?	Distance at risk (m)	Comments
2007											
12	1	22-Nov	12:57	N	ringtail	3	<20	y	y	0	glimpsed <20m at first, then picked up again lower down as it rounded corner; 4 Red Grouse went up and it followed 2 of them for a while; went down as if on large prey - not seen departing
13	1	22-Nov	15:04	N	ringtail	7	<20	y	y	0	out of sight twice - hanging on wind at 20+m at top, then glide down and contour-hugging down face of Sliabh and Ruighe Duibh (after grouse again?)
14	1	22-Nov	15:18	N	ringtail	1	20-50	n			probably same bird again, hanging to W of summit at first, then glide away
15	1	22-Nov	15:36	N	ringtail	1	<10	y	y	0	stayed low & down out of sight beyond spur
16	1	14-Dec	08:51	S	ringtail	<1	<10	n			soon out of sight
17	1	15-Dec	08:38	S	ringtail	3	<10	y	y	0	stayed low
18	1	15-Dec	14:13	S	ringtail	<1	<20	y	y	0	low and fast with wind, down out of sight beyond spur
19	3	16-Dec	09:28	S	ringtail	3	20-50	y	y	570	lost against hillside & picked up again when it broke the skyline; it was followed by a Peregrine which dived away S after a grouse, the harrier following behind. Positioning uncertain, but probably far enough away from slope to be at risk.
2008											
20	3	6-Jan	16:18	SW	ringtail	2	?	n			low over eastern ridge then across more or less level at c.550m before descending out of sight behind VP
21	1	7-Jan	10:09	S	ringtail	1	20-50	n			steady, flapping transit flight at first then low into slopes
22	1	7-Jan	14:22	SW	ringtail	3	<10	y	y	1010	found as it dived at a perched Peregrine that I was watching; the Peregrine remained unmoved, and the harrier continued more or less level across, and at 20-50m right on over spur
23	1	8-Jan	11:16	SE	ringtail	2	c.50	y	y	1040	extrapolated back to 500m contour as if at risk; lost height and continued foraging to N
24	1	18-Mar	15:33	NNW	ringtail	3	c.20	y	y	0	out across W in gentle, flapping descent; at <20m approaching risk zone and <10m across the face of Sliabh an Ruighe Duibh

Total distance flown at risk from main VP watches **11660**

TABLE J. GOSHAWK

Flight no.	Vantage point used	Date	Time	Wind direction	Bird details	Approx flight time in view (mins)	Height at detection	Flying within 500m?	Flying within 200m risk zone?	Distance at risk (m)	Comments
2007											
A	RS	9-Jul	16:56	sw	m	sev		n			flying S low along upper Enrick

KEY: Flight observed outside of timed VP watches (therefore not counted in collision risk workings)

RS = raptor search

TABLE K. GOLDEN EAGLE

Flight no.	Vantage point used	Date	Time	Wind direction	Bird details	Approx flight time in view (mins)	Height at detection	Flying within 500m?	Flying within 200m risk zone?	Distance at risk (m)	Comments
2007											
1	1	18-Apr	08:46	W	imm	6	20-100	n			hanging & gliding along top of slope; very briefly alighting
A	RS	19-Apr	16:03	NE	1-3 yrs			n			soaring & drifting S
B	close up	8-May	18:49	SW	1-3 yrs	10	500 asl	n			below Suidhe Ghuirmain at first, gaining height
2	1	9-May	11:20	SW	imm	9	>500 asl	n			No. 2 circling up to >>100m above ground; joined by no. 3 & both circling quite close until diving down out of sight one after the other
3	1	9-May	11:26	SW	?	3	600 asl	n			very distant beyond skyline
4	1	9-May	11:47	SW	?	1	?	n			alighted on skyline for c.2 mins; not seen going
5	1	9-May	12:19	SW	imm	3	20-100	n			beyond cross-ref'd map over Carn Bingally; rising to c.1000m asl then away W
6	1	9-May	12:38	SW	adult	6	>500 asl	n			hanging on wind then down into dead ground
C	RS	21-May	14:11	SW	?	<1	?	n			level across, high over lower ground, then shallow glide down out of sight beyond map
D	RS	21-May	15:01	SW	adult	4	20-100	n			
7	3	11-Jun	13:05	NE	?	2	20-100	n			distant in shimmer; no colour visible
8	3	11-Jun	13:10	NE	?	<<1	20-100	n			distant in shimmer; no colour visible
9	3	11-Jun	13:56	NE	?	4	>>100	n			rising further & glide down to Meall a Chrathaich
E	walk-out	14-Jun	20:15	NE	1-3 yrs	c.7	50-100	y	n		direction of approach not seen; mobbed by 1 Hoodie at first and then 2. At >100m above Sliabh an Ruighe Duibh, then gliding down out of sight low across ridges.
F	RS	26-Jun	15:20	NW	1-2 yrs	7		n			soaring & drifting, gaining considerable height before away E
G	RS	26-Jun	15:42	NW	1-2 yrs	4		n			appeared together, the second bird an older immature; much interaction and talon-grappling, mostly initiated by younger bird.
H	RS	26-Jun	15:42	NW	imm	4		n			
J	RS	26-Jun	16:17	NW	1-2 yrs			n			two birds close together, one diving down towards a crag at N of hill, the other drifting E
K	RS	26-Jun	16:17	NW	1-2 yrs			n			
10	3	2-Jul	16:01	S	1-2 yrs	7	c.50	y	y	0	circling up to 50-100 then shallow glide down until low over slopes below turbine positions; below rotor height within W side of risk zone. Alighted for 7 minutes then low away.
11	3	2-Jul	16:26	S	1-3 yrs	5	20-100	n			rising to >100m, then glide away beyond skyline
L	RS	15-Jul	10:10	NE	1-2 yrs			n			alighted for 16 minutes, then away N, probably hunting & dropping in height
M	RS	15-Jul	11:50	NE	adult		ground	n			sat on boulder for 11 minutes, then soared up very high drifting E then gliding down away S
12	1	30-Jul	14:58	W	imm	3	c.50	n			Probably at least 2 years old; primaries on both wings in heavy moult; steady flapping flight low in to slope
13	1	30-Jul	16:43	W	1-3 yrs	1	20-50	y	n		Perched on top of Sliabh an Ruighe Duibh for 7 minutes then low away out of sight
14	1	30-Jul	16:58	W	imm	9	20-50	y	y	1060	Probably same bird as no. 13 - tatty tail, but all primaries present, so different bird to no. 12. Not gaining much height at first and out level from Sliabh an Ruighe Duibh at c.500m asl; mobbed by 2 Hoodies across towards VP
15	1	30-Jul	17:22	W	imm	10	20-50	n			after second perch glided down directly towards VP as if checking me out; pulled up within 100m and away to Suidhe Ghuirmain, where perched for 28 minutes

Continued

KEY: Flight observed outside of timed VP watches (therefore not counted in collision risk workings)
 RS = raptor search

TABLE K. GOLDEN EAGLE (ctd)

Flight no.	Vantage point used	Date	Time	Wind direction	Bird details	Approx flight time in view (mins)	Height at detection	Flying within 500m?	Flying within 200m risk zone?	Distance at risk (m)	Comments
2007											
16	1	1-Aug	12:01	SW	imm	<<1	c.520 asl	y	n		very brief view before down beyond skyline
17	1	1-Aug	12:20	SW	2-3 yrs	3	50-100	y	y	0	saiking into wind, then glide down to skim ground before out of sight - not reappearing i.e. staying below level of turbine bases within W risk zone
18	1	1-Aug	15:49	SW	2-3 yrs	4	c.550 asl	y	y	0	moulting primaries & full crop; circled to over 600m asl then shallow glide & flap across; >100m over edge of risk zone
19	3	2-Aug	14:07	W	2-3 yrs	8	>100	y	n		moulting primaries, stayed at >100m above ground until well to south
20	3	2-Aug	17:01	W	imm	1 - 2	20-100	n			moulting primaries; glide down to alight beyond extent of map; departed unseen
21	1	12-Sep	12:44	W	2-3 yrs	10	c.500 asl	y	n		shallow glide down to c.470 asl, then back past VP at c.500 asl, circling up to several hundred m above ground & glide away
22	1	12-Sep	15:53	W	imm	<1 + 7	c.575 asl	n			bird first seen gliding away NW, soon beyond skyline; picked up 5 minutes later, when circling at >>100m & gaining height above forest before gliding on to NW - shown by two flight paths
23	1	25-Sep	09:16	NW	imm	1 - 2	20-100	y	y	880	level across risk zone [c.30 secs in zone]
24	1	25-Sep	09:26	NW	1st yr	1 - 2	<20	y	y	570	flew below no. 25, low along spur; rose to 20-100m for c.20 secs within risk zone
25	1	25-Sep	09:26	NW	imm	2	20-100	y	y	1210	at risk height through length of risk zone [c.70 secs], flying above no. 24
26	1	25-Sep	11:11	NW	imm	14	>100	y	n		soared very high, staying >100m above ground
27	1	1-Oct	12:06	SW	imm	12	>100	n			gaining height, then glide away W (to N of map)
28	1	1-Oct	12:51	SW	?adult	1	ground	n			perched for c.15 minutes, then away E
29	1	22-Nov	10:09	N	imm (?m)	15	10-20	y	n		slow hunting into wind, mostly at 20-50m; veered away when close to VP
2008											
30	3	6-Jan	12:09	SW	ad. (?m)	6	c.50	y	y	160	level flapping flight, in low to spur and out of sight (i.e. staying low); seen briefly at <20m over top of spur & then down out of view again; seen again out level (& therefore at risk) from NE side; lost in distance low against heather
31	3	6-Jan	14:45	SW	? adult	14	20-50	n			7 minutes gliding & hanging on updraughts at Suidhe Ghuirmain, then slowly into wind along ridge; descended and lost against heather - ? alighting
32	1	8-Jan	10:49	SE	imm	<<1	ground	n			seen perched for 2 minutes, then moved off E as cloud moved in to cap hill
33	1	8-Jan	13:28	SE	imm	13	post	n			seen perched for 19 minutes, when frequently looking across to W, then flying across there; losing height gradually to fly low by path, then rising to 200m+ & away high
34	1	22-Feb	12:50	W	?	1	20-100	n			sliding away on the wind in advance of a snow shower; silhouette only
35	3	17-Mar	13:03	N	ad (?m)	10	20-50	y	y	1320	more or less level, mostly flapping flight with short glides; watched out of sight well beyond N extent of map. Flight path extrapolated backwards to measure distance at risk within zone
36	3	17-Mar	14:30	N	imm (?f)	4	>>100	n			circling at height then glide down to Meall a Chrathaich; hopped down off skyline and then difficult to pick out - not seen departing

Continued

TABLE K. GOLDEN EAGLE (ctd)

Flight no.	Vantage point used	Date	Time	Wind direction	Bird details	Approx flight time in view (mins)	Height at detection	Flying within 500m?	Flying within 200m risk zone?	Distance at risk (m)	Comments
2008											
37	3	17-Mar	16:30	N	imm (?f)	2	c.675 asl	n			with full crop, rising - I followed a falcon flying S past it for a minute or two, by which time eagle had gone (but not coming across spur)
38	1	18-Mar	16:16	NNW	imm f	20	c.20	y	y	120	rising up off summit of Sliabh an Ruighe Duibh, circling at edge of risk zone; soon at >100m & rising all the way across E, then shallow dive N behind VP to ground level where doubling back over slopes; very low at Suidhe Ghuirmain again then rising away E on wind
39	1	11-Apr	12:24	SE	imm	14	ground	y	n		off perch & down along valley at 20-100m then circling to >100m, crossing next valley, before dive down to c.20m; rose high again & drifted off NW
N	RS	1-May	14:20	SW	?		>200	n			drifting SW - staying high
P	RS	2-May	11:00	SW	imm		20-100	n			being chased by adult Q - disappeared fast to E
Q	RS	2-May	11:00	SW	ad		20-100	n			chasing imm P, then landed for 9 minutes. Took off & rapidly gained height to >300m, drifting N and gaining more height before high & direct W, probably towards Affric
40	3	13-May	18:07	E	imm	10	50-100	n			drifting about along Suidhe Ghuirmainn ridge for a while, then across level, circling to >100m & mobbed by buzzard as it passed W
41	1	4-Jun	13:52	S	imm	6	40	n			probably came up Enrick valley low; landed on ridge behind VP for 11 mins then quickly gained height to N and away fast to W
R	RS	18-Jun	14:55	S	?		high	n			bird high over Suidhe Ghuirmain then away E

Total distance flown at risk from main VP watches **5320**

TABLE L. OSPREY

Flight no.	Vantage point used	Date	Time	Wind direction	Bird details	Approx flight time in view (mins)	Height at detection	Flying within 500m?	Flying over 200m risk zone?	Distance at risk (m)	Comments
2007											
A	RS	19-Apr	16:14	NW	1	-	-	n			a bird heard calling overhead, whilst in deep hollow with restricted visibility - no sign of it on climbing up onto ridge
1	3	11-Jun	13:11	NE	1	9	>>100	y	y	0	circling up then shallow glide across zone, staying well above risk height; then circling up again & lost at height
2008											
B	RS	23-Jun	11:02	W	ad			n			carrying fish - probably towards Guisachan

KEY: Flight observed outside of timed VP watches (therefore not counted in collision risk workings)

RS = raptor search

TABLE M. MERLIN

Flight no.	Vantage point used	Date	Time	Wind direction	Bird details	Approx flight time in view (mins)	Height at detection	Flying within 500m?	Flying within 200m risk zone?	Distance at risk	Comments
2007											
A	RS	20-Apr	08:24	S	f		high	n			landed on stone & stayed nearly an hour before out NW, high across reserve
B	RS	20-Apr	12:37	S	?		low	n			low & fast
C	RS	22-Apr	10:52	SW	?		low	n			low over heather then rising rapidly to N
D	drive	7-May	17:00	SW	f		post	n			skimmed low away
E	break	9-May	16:57	SW	?		<10	y	n		up to mob passing harrier; alighted - gone when I came back to it
F	RS	22-May	17:34	SW	?		c.50	n			swinging up against wind and away
G	RS	21-Jun	12:43	NE	f		low	n			probably flew out of slope
H	RS	26-Jun	15:13	NW	m		low	n			low & purposeful (but not carrying prey)
J	break	4-Jul	09:25	NW	?		20-100	n			stayed >20m
1	1	4-Jul	10:20	NW	f		50-100	y	n		staying high across to eastern slopes
2	1	12-Sep	14:40	W	m		20-50	y	n		after loop round, glide down into dead ground
3	1	12-Sep	15:15	W	[juv]		?	n			chasing with a Kestrel - soon out of sight
4	1	12-Sep	15:37	W	[juv]		20-100	n			chasing and rising with 2 [juvenile] Kestrels; diving down out of sight then picked up again on boulder; put up by Kestrel then away level, briefly chasing pipit before glide away
5	3	13-Sep	12:18	SW	?		20-100	n			twice chasing a passerine; low out of sight after second perch
2008											
6	1	22-Feb	13:22	W	[m]		20-50	n			rising away from slope then down into burn gully and out of sight
7	1	11-Apr	11:11	SE	?	<<1	50	y	y	680	seen rising up over skyline for c.10 seconds then diving down against hillside and lost against heather, still at risk height
K	RS	15-Apr	13:50	N	m+f	sev	low	n			pair seen low along plantation edge - female watched - she soared up to over 200m, twice chasing passerines at great height before away W
8	1	7-Jun	06:10	0	f	<1	<5	n			stayed low past VP
9	1	14-Aug	10:52	SE	juv	1	40	n			erratic flight as it chased a pipit

Total distance flown at risk from main VP watches **680**

KEY: Flight observed outside of timed VP watches (therefore not counted in collision risk workings)

RS = raptor search

TABLE N. PEREGRINE

Flight no.	Vantage point used	Date	Time	Wind direction	Bird details	Approx flight time in view (mins)	Height at detection	Flying within 500m?	Flying within 200m risk zone?	Distance at risk (m)	Comments
2007											
1	1	18-Apr	10:21	W	ad	2	<20	n			probable female; with full crop approaching VP low then up slope & away E after hanging on wind for a while
A	RS	20-Apr	09:05	NW	?	<1	low	n			fast and low along top of slope
2	1	22-May	09:54	SW	?	2	20-100	n			carrying sizeable prey, heading directly to E
3	1	20-Nov	08:31	NE	?	<1	10	n			flying level out of sight to E
4	3	16-Dec	09:29	S	?	2	?>20	y	y	350 - 500m	height difficult to tell, depending on how close bird was to slopes of Sliabh and Ruighe Duibh - but probably at risk height throughout. Lost against hillside briefly then picked up again in shallow stoop at Red Grouse, with a Hen Harrier (no. 19) following it down.
2008											
5	1	7-Jan	12:43	S	ad [f]	<1	<10	n			seen just before alighting, where it stayed for over 90 minutes. Not seen departing (it left while I was following Hen Harrier no. 22).
B	RS	23-Jun	12:29	W	ad		post	y	n		flew south from post at FC edge, quickly gaining height
6	1	28-Jul	12:50	E	?	8	200	n			soared higher & higher, mobbed by Kestrel, then away E

Total distance flown at risk from main VP watches **500**

KEY: Flight observed outside of timed VP watches (therefore not counted in collision risk workings)
 RS = raptor search

STAGE 1. *Extrapolation of distance flown at risk***1 (a) Observed flight paths at risk**

Flight number	Month	Measured distance on large-scale map (map B 17), expressed as metres			Total measured distance	Timed flights (secs)	Distance at 8 m/sec	Distance used	Notes
		straights	circles	circles x 4					
5	July 2007	60			60			60	
6	July 2007	1190	100	400	1590			1590	
7	July 2007	1250	500	2000	3250	450	3600	3600	higher fig used
8	July 2007	920	530	2120	3040	375	3000	3040	higher fig used
<i>Breeding season subtotal</i>								8290	
11	November 07	510	60	240	750			750	
19	December 07	570			570			570	
22	January 08	1010			1010			1010	
23	January 09	1040			1040			1040	
<i>Non-breeding season subtotal</i>								3370	

Overall total: **11660 m**

1 (b) Available flying time for raptors in Inverness-shire

Month	Average sunrise to sunrise hours (taken from 15th of month)	Number of days	Sunrise to sunset hours per month	Additional twilight in shortest winter days (1/2 hr per day 21/11 - 19/01)	Total available flying hours for month	Timed VP hours from Main VPs	Less hours beyond sunrise/sunset or twilight	Timed hours for raptor collision risk	Flight length observed at risk
April	14.00	30	420.00		420.00	26.00	0.25	25.75	
May	16.00	31	496.00		496.00	25.50	0.50	25.00	
June	17.50	30	525.00		525.00	26.00		26.00	
July	16.75	31	519.25		519.25	36.00		36.00	8290
August	15.00	31	465.00		465.00	35.00	0.25	34.75	
<i>Breeding season subtotals</i>			2425.25	0.00	2425.25	148.50	1.00	147.50	8290
September	12.75	30	382.50		382.50	20.50		20.50	
October	10.50	31	325.50		325.50	20.00	0.25	19.75	
November	8.50	30	255.00	5.00	260.00	17.75	0.25	17.50	750
December	7.25	31	224.75	15.50	240.25	18.25		18.25	570
January	7.75	31	240.25	9.50	249.75	19.25	0.50	18.75	2050
February	9.75	28	273.00		273.00	18.00	0.50	17.50	
March	11.75	31	364.25		364.25	20.00	0.50	19.50	
<i>Non-breeding season subtotals</i>			2065.25	30.00	2095.25	133.75	2.00	131.75	3370
TOTALS			4490.50	30.00	4520.50	282.25	3.00	279.25	11660

1 (c) Extrapolation from observations

Season	Total available hours	Hours watched at Corrimony	% of hours watched	Length of harrier flight at risk within risk zone (m)	Extrapolated metres at risk (length/% hours watched)
Breeding: April-August	2425.25	147.50	6.08%	8290	136307
Non-breeding: September-March	2095.25	131.75	6.29%	3370	53594
TOTALS	4520.50	279.25		11660	189901

STAGE 2. Calculation of collision probability for a Hen Harrier passing through the rotor area

Only enter input parameters in blue

W Band

K: [1D or [3D] (0 or 1) **1**
 NoBlades **3**
 MaxChord **4.145** m
 Pitch (degrees) **30**
 BirdLength **0.48** m
 Wingspan **1.1** m
 F: Flapping (0) or gliding (+1) **0**
 Bird speed **10** m/sec
 RotorDiam **71** m
 RotationPeriod **4.28** sec
 Bird aspect ratio: b **0.44**

Calculation of alpha and p(collision) as a function of radius

			Upwind:			Downwind:			check area total
r/R radius	c/C chord	α alpha	collide length	p(collision)	contribution from radius r	collide length	p(collision)	contribution from radius r	
0.025	1.000	7.68	38.07	1.00	0.00125	33.92	1.00	0.00125	0.00125
0.075	1.000	2.56	14.07	0.99	0.00740	9.93	0.70	0.00522	0.0075
0.125	0.975	1.54	9.08	0.64	0.00796	5.04	0.35	0.00442	0.0125
0.175	0.850	1.10	6.31	0.44	0.00774	2.79	0.20	0.00342	0.0175
0.225	0.750	0.85	4.79	0.34	0.00755	1.68	0.12	0.00265	0.0225
0.275	0.650	0.70	3.74	0.26	0.00721	1.05	0.07	0.00202	0.0275
0.325	0.550	0.59	2.95	0.21	0.00673	0.68	0.05	0.00154	0.0325
0.375	0.500	0.51	2.52	0.18	0.00662	0.68	0.05	0.00179	0.0375
0.425	0.475	0.45	2.25	0.16	0.00671	0.71	0.05	0.00212	0.0425
0.475	0.450	0.40	2.07	0.14	0.00688	0.76	0.05	0.00253	0.0475
0.525	0.425	0.37	1.92	0.13	0.00706	0.80	0.06	0.00296	0.0525
0.575	0.400	0.33	1.79	0.13	0.00721	0.83	0.06	0.00334	0.0575
0.625	0.350	0.31	1.59	0.11	0.00697	0.82	0.06	0.00359	0.0625
0.675	0.325	0.28	1.49	0.10	0.00703	0.82	0.06	0.00389	0.0675
0.725	0.300	0.26	1.39	0.10	0.00705	0.82	0.06	0.00415	0.0725
0.775	0.275	0.25	1.29	0.09	0.00703	0.81	0.06	0.00438	0.0775
0.825	0.250	0.23	1.21	0.08	0.00698	0.79	0.06	0.00456	0.0825
0.875	0.250	0.22	1.19	0.08	0.00733	0.80	0.06	0.00491	0.0875
0.925	0.225	0.21	1.11	0.08	0.00722	0.78	0.05	0.00505	0.0925
0.975	0.175	0.20	0.97	0.07	0.00660	0.72	0.05	0.00491	0.0975
Overall p(collision) =			Upwind	13.7%	Downwind	6.9%	1.00		
			Average		10.3%				

STAGE 3. Collision risk calculations on a volume basis**Without avoidance:**

a)	Annual expected distance traversed at risk height within 200m risk zone	(from stage 1)	189901
b)	adjustment to account for risk airspace coverage from VPs - estimated at 97.5%		194770
c)	Risk area on the ground: - a circle 403m in radius, plus a rectangle of 806m x 564m	964873	
d)	Risk volume: risk area x the 20-100m flight bracket (m ³)	(c x 80)	77189840
e)	Rotor swept area ; the area of five circles with radii as the blade length: 35.5 x 35.5 x 3.142 (m ²)		19798
f)	Maximum chord (width) of blade		4.145
g)	Maximum angle of pitch assumed (degrees)		30
h)	Assumed depth of rotor blade	(f x sine g)	2.073
i)	Total risk depth is blade depth + bird length	(h + 0.48m)	2.553
j)	Rotor swept volume (m ³)	(e x i)	50534.40
k)	Proportion of rotor swept volume to total risk volume	(j/d x 100)	0.0655%
l)	Distance (in m) traversed per year through rotor swept volume	(b x k)	127.51
m)	Number of traverses through rotor swept volume	(l / i)	49.96
n)	Number of traverses when rotorblades are turning, assuming turbines are operational for 85% of the time	(m x 85%)	42.46
o)	number of birds expected to collide, using the average probability calculated in stage 2, of: 10.3%	(n x 10.3%)	4.37

Application of avoidance rates:

Number of fatalities expected per year, and the average number of years expected between fatalities (the fatality interval) using a range of avoidance rates:

Possible avoidance rates	98.0%	99.0%
Fatality rate (100% - avoidance rate)	2.0%	1.0%
No. of fatalities per year (o x fatality rate)	0.087	0.044
Fatality interval (1/fatalities per year)	11.4	22.9

STAGE 1. *Extrapolation of distance flown at risk***1 (a) Observed flight paths at risk**

Flight number	Month	Measured distance on large-scale map (map B27), expressed as metres			Total measured distance	Estimated times at risk (secs)	Distance at 15 m/s (circling) & 20 m/s	Distance used	Notes
		straights	circles	circles x 4					
14	July 2007	340	180	720	1060	70	1050	1060	higher fig used
23	September 07	880			880	30	600	880	higher fig used
24	September 07	570			570	20	400	570	higher fig used
25	September 07	1210			1210	60	1200	1210	higher fig used
30	January 08	160			170			170	
35	March 2008	1320			1320			1320	
38	March 2008	120			120			120	

Overall total: 5330 m

1 (b) Available flying time for raptors in Inverness-shire

Month	Average sunrise to sunrise hours (taken from 15th of month)	Number of days	Sunrise to sunset hours per month	Additional twilight in shortest winter days (1/2 hr per day 21/11 - 19/01)	Total available flying hours for month	Timed VP hours from Main VPs	Less hours beyond sunrise/sunset or twilight	Timed hours for raptor collision risk	Flight length observed at risk
April	14.00	30	420.00		420.00	26.00	0.25	25.75	
May	16.00	31	496.00		496.00	25.50	0.50	25.00	
June	17.50	30	525.00		525.00	26.00		26.00	
July	16.75	31	519.25		519.25	36.00		36.00	1060
August	15.00	31	465.00		465.00	35.00	0.25	34.75	2660
September	12.75	30	382.50		382.50	20.50		20.50	
October	10.50	31	325.50		325.50	20.00	0.25	19.75	
November	8.50	30	255.00	5.00	260.00	17.75	0.25	17.50	
December	7.25	31	224.75	15.50	240.25	18.25		18.25	
January	7.75	31	240.25	9.50	249.75	19.25	0.50	18.75	170
February	9.75	28	273.00		273.00	18.00	0.50	17.50	1440
March	11.75	31	364.25		364.25	20.00	0.50	19.50	
TOTALS			4490.50	30.00	4520.50	282.25	3.00	279.25	5330

1 (c) Extrapolation from observations

Whole year	Total available hours	Hours watched at Corrimony	% of hours watched	Length of eagle flight at risk within risk zone (m)	Extrapolated metres at risk (length/% hours watched)
Whole year: January- December	4520.50	279.25	6.18%	5330	86282
TOTALS	4520.50	279.25		5330	86282

STAGE 2. Calculation of collision probability for a Golden Eagle passing through the rotor area

Only enter input parameters in blue

W Band

K: [1D or [3D] (0 or 1) **1**
 NoBlades **3**
 MaxChord **4.145** m
 Pitch (degrees) **30**
 BirdLength **0.82** m
 Wingspan **2.12** m
 F: Flapping (0) or gliding (+1) **0**
 Bird speed **20** m/sec
 RotorDiam **71** m
 RotationPeriod **4.28** sec

Calculation of alpha and p(collision) as a function of radius

r/R radius	c/C chord	α alpha	Upwind:			Downwind:			check area total
			collide length	p(collision)	contribution from radius r	collide length	p(collision)	contribution from radius r	
0.025	1.000	15.35	89.72	1.00	0.00125	85.57	1.00	0.00125	0.00125
0.075	1.000	5.12	31.29	1.00	0.00750	27.14	0.95	0.00713	0.0075
0.125	0.975	3.07	19.27	0.68	0.00844	15.23	0.53	0.00667	0.0125
0.175	0.850	2.19	13.10	0.46	0.00804	9.58	0.34	0.00587	0.0175
0.225	0.750	1.71	9.76	0.34	0.00770	6.65	0.23	0.00525	0.0225
0.275	0.650	1.40	7.56	0.27	0.00729	4.87	0.17	0.00469	0.0275
0.325	0.550	1.18	5.97	0.21	0.00681	3.69	0.13	0.00421	0.0325
0.375	0.500	1.02	5.04	0.18	0.00663	2.97	0.10	0.00390	0.0375
0.425	0.475	0.90	4.44	0.16	0.00661	2.47	0.09	0.00368	0.0425
0.475	0.450	0.81	3.95	0.14	0.00658	2.09	0.07	0.00347	0.0475
0.525	0.425	0.73	3.55	0.12	0.00652	1.78	0.06	0.00328	0.0525
0.575	0.400	0.67	3.20	0.11	0.00645	1.54	0.05	0.00311	0.0575
0.625	0.350	0.61	2.80	0.10	0.00613	1.35	0.05	0.00295	0.0625
0.675	0.325	0.57	2.54	0.09	0.00601	1.22	0.04	0.00288	0.0675
0.725	0.300	0.53	2.31	0.08	0.00588	1.17	0.04	0.00298	0.0725
0.775	0.275	0.50	2.11	0.07	0.00573	1.13	0.04	0.00307	0.0775
0.825	0.250	0.47	1.92	0.07	0.00556	1.09	0.04	0.00314	0.0825
0.875	0.250	0.44	1.84	0.06	0.00565	1.05	0.04	0.00323	0.0875
0.925	0.225	0.41	1.68	0.06	0.00545	1.01	0.04	0.00328	0.0925
0.975	0.175	0.39	1.44	0.05	0.00494	0.95	0.03	0.00325	0.0975

Overall p(collision) = Upwind 12.5% Downwind 7.7% 1.00
 Average 10.1%

Weighted by wind direction:

	m at risk	% risk	Band %	Contribn
Upwind	2200	41.4%	12.5%	5.2%
Downwind	500	9.4%	7.7%	0.7%
'Average'	2620	49.2%	10.1%	5.0%
	5320	100.0%		10.9%

STAGE 3. Collision risk calculations on a volume basis**Without avoidance:**

a)	Annual expected distance traversed at risk height within 200m risk zone	(from stage 1)	86282
b)	adjustment to account for risk airspace coverage from VPs - estimated at 97.5%		88494
c)	Risk area on the ground: - a circle 403m in radius, plus a rectangle of 806m x 564m	964873	
d)	Risk volume: risk area x the 20-100m flight bracket (m ³)	(c x 80)	77189840
e)	Rotor swept area ; the area of five circles with radii as the blade length: 35.5 x 35.5 x 3.142 (m ²)		19798
f)	Maximum chord (width) of blade		4.145
g)	Maximum angle of pitch assumed (degrees)		30
h)	Assumed depth of rotor blade	(f x sine g)	2.073
i)	Total risk depth is blade depth + bird length	(h + 0.82m)	2.893
j)	Rotor swept volume (m ³)	(e x i)	57265.72
k)	Proportion of rotor swept volume to total risk volume	(j/d x 100)	0.0742%
l)	Distance (in m) traversed per year through rotor swept volume	(b x k)	65.65
m)	Number of traverses through rotor swept volume	(l / i)	22.70
n)	Number of traverses when rotorblades are turning, assuming turbines are operational for 85% of the time	(m x 85%)	19.29
o)	number of birds expected to collide, using the weighted probability calculated in stage 2, of: 10.9%	(n x 10.9%)	2.10

Application of avoidance rates:

Number of fatalities expected per year, and the average number of years expected between fatalities (the fatality interval) using a range of avoidance rates:

Possible avoidance rates	98.0%	99.0%
Fatality rate (100% - avoidance rate)	2.0%	1.0%
No. of fatalities per year (o x fatality rate)	0.042	0.021
Fatality interval (1/fatalities per year)	23.8	47.6

STAGE 1. *Extrapolation of distance flown at risk***1 (a) Observed flight paths at risk**

Flight number	Month	Measured distance on map B 28, expressed as metres			Total measured distance	Timed flights (secs)	Distance at X m/sec	Distance used	Notes
		straights	circles	circles x 4					
7	April 2008	680			680			680	
<i>Total</i>								680	

Overall total: **680 m****1 (b) Extrapolation from observations**

The figures for total available hours and the hours watched are taken from part 1 (b) in the Golden Eagle workings, Table P.

Whole year	Total available hours	Hours watched at Corrimony	% of hours watched	Length of eagle flight at risk within risk zone (m)	Extrapolated metres at risk (length/% hours watched)
Whole year: January- December	4520.50	279.25	6.18%	680	11008
TOTALS	4520.50	279.25		680	11008

STAGE 2. Calculation of collision probability for a Hen Harrier passing through the rotor area

Only enter input parameters in blue

W Band

K: [1D or [3D] (0 or 1) **1**
 NoBlades **3**
 MaxChord **4.145** m
 Pitch (degrees) **30**
 BirdLength **0.28** m
 Wingspan **0.56** m
 F: Flapping (0) or gliding (+1) **0**
 Bird speed **10** m/sec
 RotorDiam **71** m
 RotationPeriod **4.28** sec
 Bird aspect ratio: b **0.50**

Calculation of alpha and p(collision) as a function of radius

r/R radius	c/C chord	α alpha	Upwind:			Downwind:			check area total
			collide length	p(collision)	contribution from radius r	collide length	p(collision)	contribution from radius r	
0.025	1.000	7.68	33.92	1.00	0.00125	29.78	1.00	0.00125	0.00125
0.075	1.000	2.56	12.69	0.89	0.00667	8.54	0.60	0.00449	0.0075
0.125	0.975	1.54	8.25	0.58	0.00723	4.21	0.30	0.00369	0.0125
0.175	0.850	1.10	5.72	0.40	0.00702	2.20	0.15	0.00270	0.0175
0.225	0.750	0.85	4.33	0.30	0.00683	1.22	0.09	0.00192	0.0225
0.275	0.650	0.70	3.37	0.24	0.00649	0.67	0.05	0.00129	0.0275
0.325	0.550	0.59	2.64	0.18	0.00601	0.36	0.02	0.00081	0.0325
0.375	0.500	0.51	2.24	0.16	0.00589	0.40	0.03	0.00106	0.0375
0.425	0.475	0.45	2.03	0.14	0.00606	0.49	0.03	0.00147	0.0425
0.475	0.450	0.40	1.87	0.13	0.00621	0.56	0.04	0.00186	0.0475
0.525	0.425	0.37	1.72	0.12	0.00632	0.60	0.04	0.00222	0.0525
0.575	0.400	0.33	1.59	0.11	0.00640	0.63	0.04	0.00254	0.0575
0.625	0.350	0.31	1.39	0.10	0.00609	0.62	0.04	0.00271	0.0625
0.675	0.325	0.28	1.29	0.09	0.00608	0.62	0.04	0.00294	0.0675
0.725	0.300	0.26	1.19	0.08	0.00603	0.62	0.04	0.00313	0.0725
0.775	0.275	0.25	1.09	0.08	0.00594	0.61	0.04	0.00329	0.0775
0.825	0.250	0.23	1.01	0.07	0.00582	0.59	0.04	0.00341	0.0825
0.875	0.250	0.22	0.99	0.07	0.00610	0.60	0.04	0.00369	0.0875
0.925	0.225	0.21	0.91	0.06	0.00593	0.58	0.04	0.00375	0.0925
0.975	0.175	0.20	0.77	0.05	0.00524	0.52	0.04	0.00355	0.0975

Overall p(collision) = Upwind 12.0% Downwind 5.2% 1.00
 Average 8.6%

STAGE 3. Collision risk calculations on a volume basis**Without avoidance:**

a)	Annual expected distance traversed at risk height within 200m risk zone	(from stage 1)	11008
b)	adjustment to account for risk airspace coverage from VPs (97.5%) & observer efficiency (50%)		22581
c)	Risk area on the ground: - a circle 403m in radius, plus a rectangle of 806m x 564m	964873	
d)	Risk volume: risk area x the 20-100m flight bracket (m ³)	(c x 80)	77189840
e)	Rotor swept area ; the area of five circles with radii as the blade length: 35.5 x 35.5 x 3.142 (m ²)		19798
f)	Maximum chord (width) of blade		4.145
g)	Maximum angle of pitch assumed (degrees)		30
h)	Assumed depth of rotor blade	(f x sine g)	2.073
i)	Total risk depth is blade depth + bird length	(h + 0.28m)	2.353
j)	Rotor swept volume (m ³)	(e x i)	46574.80
k)	Proportion of rotor swept volume to total risk volume	(j/d x 100)	0.0603%
l)	Distance (in m) traversed per year through rotor swept volume	(b x k)	13.62
m)	Number of traverses through rotor swept volume	(l / i)	5.79
n)	Number of traverses when rotorblades are turning, assuming turbines are operational for 85% of the time	(m x 85%)	4.92
o)	number of birds expected to collide, using the average probability calculated in stage 2, of: 8.6%	(n x 8.6%)	0.42

Application of avoidance rates:

Number of fatalities expected per year, and the average number of years expected between fatalities (the fatality interval) using a range of avoidance rates:

Possible avoidance rates	95.0%	98.0%
Fatality rate (100% - avoidance rate)	5.0%	2.0%
No. of fatalities per year (o x fatality rate)	0.021	0.008
Fatality interval (1/fatalities per year)	47.2	118.1

STAGE 1. *Extrapolation of distance flown at risk***1 (a) Observed flight paths at risk**

Flight number	Month	Measured distance on map B 29, expressed as metres			Total measured distance	Timed flights (secs)	Distance at X m/sec	Distance used	Notes
		straights	circles	circles x 4					
4	December 08	350 - 500			350 - 500			500	
<i>Total</i>								500	

Overall total: **500 m****1 (b) Extrapolation from observations**

The figures for total available hours and the hours watched are taken from part 1 (b) in the Golden Eagle workings, Table P.

Whole year	Total available hours	Hours watched at Corrimony	% of hours watched	Length of eagle flight at risk within risk zone (m)	Extrapolated metres at risk (length/% hours watched)
Whole year: January- December	4520.50	279.25	6.18%	500	8094
TOTALS	4520.50	279.25		500	8094

STAGE 2. Calculation of collision probability for a Hen Harrier passing through the rotor area

Only enter input parameters in blue

W Band

K: [1D or [3D] (0 or 1) **1**
 NoBlades **3**
 MaxChord **4.145** m
 Pitch (degrees) **30**
 BirdLength **0.42** m
 Wingspan **1.03** m
 F: Flapping (0) or gliding (+1) **0**
 Bird speed **10** m/sec
 RotorDiam **71** m
 RotationPeriod **4.28** sec
 Bird aspect ratio: b **0.41**

Calculation of alpha and p(collision) as a function of radius

		Upwind:			Downwind:			check area
r/R	c/C	α	collide	contribution	collide	contribution	check area	
radius	chord	alpha	length	p(collision)	length	p(collision)	total	
0.025	1.000	7.68	37.53	1.00	0.00125	33.38	1.00	0.00125
0.075	1.000	2.56	13.89	0.97	0.00730	9.75	0.68	0.00512
0.125	0.975	1.54	8.97	0.63	0.00786	4.93	0.35	0.00432
0.175	0.850	1.10	6.24	0.44	0.00765	2.71	0.19	0.00333
0.225	0.750	0.85	4.73	0.33	0.00746	1.62	0.11	0.00255
0.275	0.650	0.70	3.69	0.26	0.00712	1.00	0.07	0.00193
0.325	0.550	0.59	2.91	0.20	0.00664	0.63	0.04	0.00144
0.375	0.500	0.51	2.48	0.17	0.00652	0.64	0.05	0.00170
0.425	0.475	0.45	2.22	0.16	0.00661	0.68	0.05	0.00202
0.475	0.450	0.40	2.01	0.14	0.00668	0.70	0.05	0.00233
0.525	0.425	0.37	1.86	0.13	0.00684	0.74	0.05	0.00273
0.575	0.400	0.33	1.73	0.12	0.00697	0.77	0.05	0.00310
0.625	0.350	0.31	1.53	0.11	0.00671	0.76	0.05	0.00333
0.675	0.325	0.28	1.43	0.10	0.00674	0.76	0.05	0.00360
0.725	0.300	0.26	1.33	0.09	0.00674	0.76	0.05	0.00385
0.775	0.275	0.25	1.23	0.09	0.00671	0.75	0.05	0.00405
0.825	0.250	0.23	1.15	0.08	0.00663	0.73	0.05	0.00422
0.875	0.250	0.22	1.13	0.08	0.00696	0.74	0.05	0.00455
0.925	0.225	0.21	1.05	0.07	0.00683	0.72	0.05	0.00466
0.975	0.175	0.20	0.91	0.06	0.00619	0.66	0.05	0.00450
Overall p(collision) =			Upwind	13.2%	Downwind	6.5%	1.00	
			Average		9.9%			

STAGE 3. Collision risk calculations on a volume basis

Without avoidance:

a)	Annual expected distance traversed at risk height within 200m risk zone	(from stage 1)	8094
b)	adjustment to account for risk airspace coverage from VPs (97.5%)		8302
c)	Risk area on the ground: - a circle 403m in radius, plus a rectangle of 806m x 564m	964873	
d)	Risk volume: risk area x the 20-100m flight bracket (m ³)	(c x 80)	77189840
e)	Rotor swept area ; the area of five circles with radii as the blade length: 35.5 x 35.5 x 3.142 (m ²)		19798
f)	Maximum chord (width) of blade		4.145
g)	Maximum angle of pitch assumed (degrees)		30
h)	Assumed depth of rotor blade	(f x sine g)	2.073
i)	Total risk depth is blade depth + bird length	(h + 0.42m)	2.493
j)	Rotor swept volume (m ³)	(e x i)	49346.52
k)	Proportion of rotor swept volume to total risk volume	(j/d x 100)	0.0639%
l)	Distance (in m) traversed per year through rotor swept volume	(b x k)	5.31
m)	Number of traverses through rotor swept volume	(l / i)	2.13
n)	Number of traverses when rotorblades are turning, assuming turbines are operational for 85% of the time	(m x 85%)	1.81
o)	number of birds expected to collide, using the average probability calculated in stage 2, of: 9.9%	(n x 9.9%)	0.18

Application of avoidance rates:

Number of fatalities expected per year, and the average number of years expected between fatalities (the fatality interval) using a range of avoidance rates:

Possible avoidance rates	95.0%	98.0%
Fatality rate (100% - avoidance rate)	5.0%	2.0%
No. of fatalities per year (o x fatality rate)	0.009	0.004
Fatality interval (1/fatalities per year)	111.6	279.1

Birds from all fieldwork 2007/2008

(* species not mentioned in report)

Whooper Swan	<i>Cygnus cygnus</i>	V occasional, passage/winter; single figures only
Pink-footed Goose	<i>Anser brachyrhynchus</i>	Occasional, overhead passage; up to 150 birds
Greylag Goose	<i>Anser anser</i>	2-4 pairs; near L Comhnard & L ma Stac
Teal	<i>Anas crecca</i>	Several pairs, L Comhnard & wider area
Mallard	<i>Anas platyrhynchos</i>	Several pairs, L Comhnard & wider area
Goosander	<i>Mergus merganser</i>	2-3 pairs? - up to 6 females along Enrick
Red Grouse	<i>Lagopus lagopus</i>	Widely distributed on moorland
Black Grouse	<i>Tetrao tetrix</i>	Leks on and near RSPB reserve
*Quail	<i>Coturnix coturnix</i>	1 calling by L ma Stac, July 07
Red-throated Diver	<i>Gavia stellata</i>	Up to 2 birds in wider area
Black-throated Diver	<i>Gavia arctica</i>	Up to 3 birds in wider area
Little Grebe	<i>Tachybaptus ruficollis</i>	3-4 pairs, L Comhnard & wider area
Cormorant	<i>Phalacrocorax carbo</i>	1 flying past
Grey Heron	<i>Ardea cinerea</i>	Single birds occasional in summer along rivers
Red Kite	<i>Milvus milvus</i>	1 flying past in wider area
Hen Harrier	<i>Circus cyaneus</i>	Frequently seen; at least 3 different individuals
Goshawk	<i>Accipiter gentilis</i>	1 flying past
Sparrowhawk	<i>Accipiter nisus</i>	1-2 pairs in woods; occasionally seen in open
Buzzard	<i>Buteo buteo</i>	Several pairs in wider area; frequently seen
Golden Eagle	<i>Aquila chrysaetos</i>	Young birds frequently seen; occasional adults
Osprey	<i>Pandion haliaetus</i>	3 single birds flying over
Kestrel	<i>Falco tinnunculus</i>	1-2 pairs in wider area; occasionally seen
Merlin	<i>Falco columbarius</i>	Fairly frequent, single birds
*Hobby	<i>Falco subbuteo</i>	1 near L Liath, June 08, away to SE
Peregrine	<i>Falco peregrinus</i>	Occasional, single birds
Oystercatcher	<i>Haematopus ostralegus</i>	1 bird, lower access
*Ringed Plover	<i>Charadrius hiaticula</i>	1 bird L ma Stac, June 08
Golden Plover	<i>Pluvialis apricaria</i>	Widely distributed on moorland
Lapwing	<i>Vanellus vanellus</i>	2-3 pairs by mid Enrick
Dunlin	<i>Calidris alpina</i>	A few pairs scattered on higher moorland
Jack Snipe	<i>Lymnocyptes minimus</i>	1 from moorland, Nov 07
Snipe	<i>Gallinago gallinago</i>	Common breeder on lower moorland
Woodcock	<i>Scolopax rusticola</i>	Roding males 07 & 08; singles from moor in Nov
Curlew	<i>Numenius arquata</i>	2 pairs by mid Enrick
Common Sandpiper	<i>Actitis hypoleucos</i>	Several pairs along rivers
Greenshank	<i>Tringa nebularia</i>	Several pairs widely distributed
Redshank	<i>Tringa totanus</i>	1 bird, L Comhnard, April 07
Great Skua	<i>Stercorarius skua</i>	2 singles passing, May & Sept 07
Common Gull	<i>Larus canus</i>	A few pairs L ma Stac
Lesser Black-backed Gull	<i>Larus fuscus</i>	Occasional passing birds
Herring Gull	<i>Larus argentatus</i>	1 bird flying past
Woodpigeon	<i>Columba palumbus</i>	Small numbers in woodlands
Cuckoo	<i>Cuculus canorus</i>	Several calling, mainly from woods/wood edges
Barn Owl	<i>Tyto alba</i>	1 at farmyard, lower access, July 07
Tawny Owl	<i>Strix aluco</i>	Heard/seen by farmyard & in lower woods, RSPB
Long-eared Owl	<i>Asio otus</i>	2 seen in upper trees/forestry, Apr 07 & May 08
Swift	<i>Apus apus</i>	Occasional in ones-tuos overhead
Great Spotted Woodpecker	<i>Dendrocopos major</i>	2-3 pairs in lower woodland

Skylark	<i>Alauda arvensis</i>	Common on moorland
Sand Martin	<i>Riparia riparia</i>	A small colony along mid Enrick
Swallow	<i>Hirundo rustica</i>	1-2 pairs by farmhouse, lower access
House Martin	<i>Delichon urbicum</i>	1-2 pairs by farmhouse, lower access
Tree Pipit	<i>Anthus trivialis</i>	Several pairs in birch woods
Meadow Pipit	<i>Anthus pratensis</i>	Abundant on moorland
Grey Wagtail	<i>Motacilla cinerea</i>	A few pairs along rivers
Pied Wagtail	<i>Motacilla alba</i>	A few pairs along rivers
Waxwing	<i>Bombycilla garrulus</i>	2 birds feeding by Enrick gorge, Nov 08
Dipper	<i>Cinclus cinclus</i>	Very occasionally seen, upper Enrick
Wren	<i>Troglodytes troglodytes</i>	Common in most wooded areas
Dunnock	<i>Prunella modularis</i>	Several pairs, concentrated in clearfell
Robin	<i>Erithacus rubecula</i>	Common in some wooded areas
Redstart	<i>Phoenicurus phoenicurus</i>	3-4 pairs, lower access route
Whinchat	<i>Saxicola rubetra</i>	4-5 pairs, RSPB reserve
Stonechat	<i>Saxicola torquata</i>	Widely distributed up to lower moorlands
Wheatear	<i>Oenanthe oenanthe</i>	3-4 pairs, upper & mid Enrick
Blackbird	<i>Turdus merula</i>	Only along lower access route
Fieldfare	<i>Turdus pilaris</i>	Small numbers of passage birds
Song Thrush	<i>Turdus philomelos</i>	Several pairs in most woods/forestry
Redwing	<i>Turdus iliacus</i>	Possibly 1 pair; small numbers of passage birds
Mistle Thrush	<i>Turdus viscivorus</i>	Several pairs in birch woods & forestry
Blackcap	<i>Sylvia atricapilla</i>	2-3 pairs by lower access route
Wood Warbler	<i>Phylloscopus sibilatrix</i>	3 pairs in birch woods down to Fasnakyle
Willow Warbler	<i>Phylloscopus trochilus</i>	Common in all wooded & scrubby areas
Goldcrest	<i>Regulus regulus</i>	Occasionally detected in forestry
Spotted Flycatcher	<i>Muscicapa striata</i>	Several pairs along access route
Blue Tit	<i>Cyanistes caeruleus</i>	Several pairs in lower wooded areas
Great Tit	<i>Parus major</i>	Several pairs in lower wooded areas
Coal Tit	<i>Parus ater</i>	Widely distributed in all wooded areas
Treecreeper	<i>Certhia familiaris</i>	4 birds detected along access route
Jay	<i>Garrulus glandarius</i>	2 single birds by lower access (Jan, Mar); 1 bird in upper forestry (Aug 08)
Jackdaw	<i>Corvus monedula</i>	A few pairs by farmyard, lower access
Hooded Crow	<i>Corvus cornix</i>	Frequently seen in small numbers
Raven	<i>Corvus corax</i>	Frequent in small numbers, mostly in winter
Starling	<i>Sturnus vulgaris</i>	A couple of pairs by farmhouse & lower access
House Sparrow	<i>Passer domesticus</i>	A few pairs by farmhouse, lower access
Chaffinch	<i>Fringilla coelebs</i>	Common in all wooded areas
Greenfinch	<i>Carduelis chloris</i>	1 pair by lower access
Goldfinch	<i>Carduelis carduelis</i>	1 pair by lower access
Siskin	<i>Carduelis spinus</i>	Frequently seen in/over wooded areas
Twite	<i>Carduelis flavirostris</i>	Probable family party by mid Enrick, July 07
Lesser Redpoll	<i>Carduelis cabaret</i>	A few pairs in lower wooded areas
Common Crossbill	<i>Loxia curvirostra</i>	All Crossbills recorded as Crossbill sp. - frequent in/over wooded areas in groups of up to 18 birds.
Scottish Crossbill	<i>Loxia scotica</i>	
Parrot Crossbill	<i>Loxia pytyopsittacus</i>	
Bullfinch	<i>Pyrrhula pyrrhula</i>	1 pair by mid Enrick; up to 25 in heather, RSPB reserve, Dec/Jan
Snow Bunting	<i>Plectrophenax nivalis</i>	Groups of up to 24 feeding on moorland in winter
Reed Bunting	<i>Emberiza schoeniclus</i>	2-3 pairs, RSPB reserve.