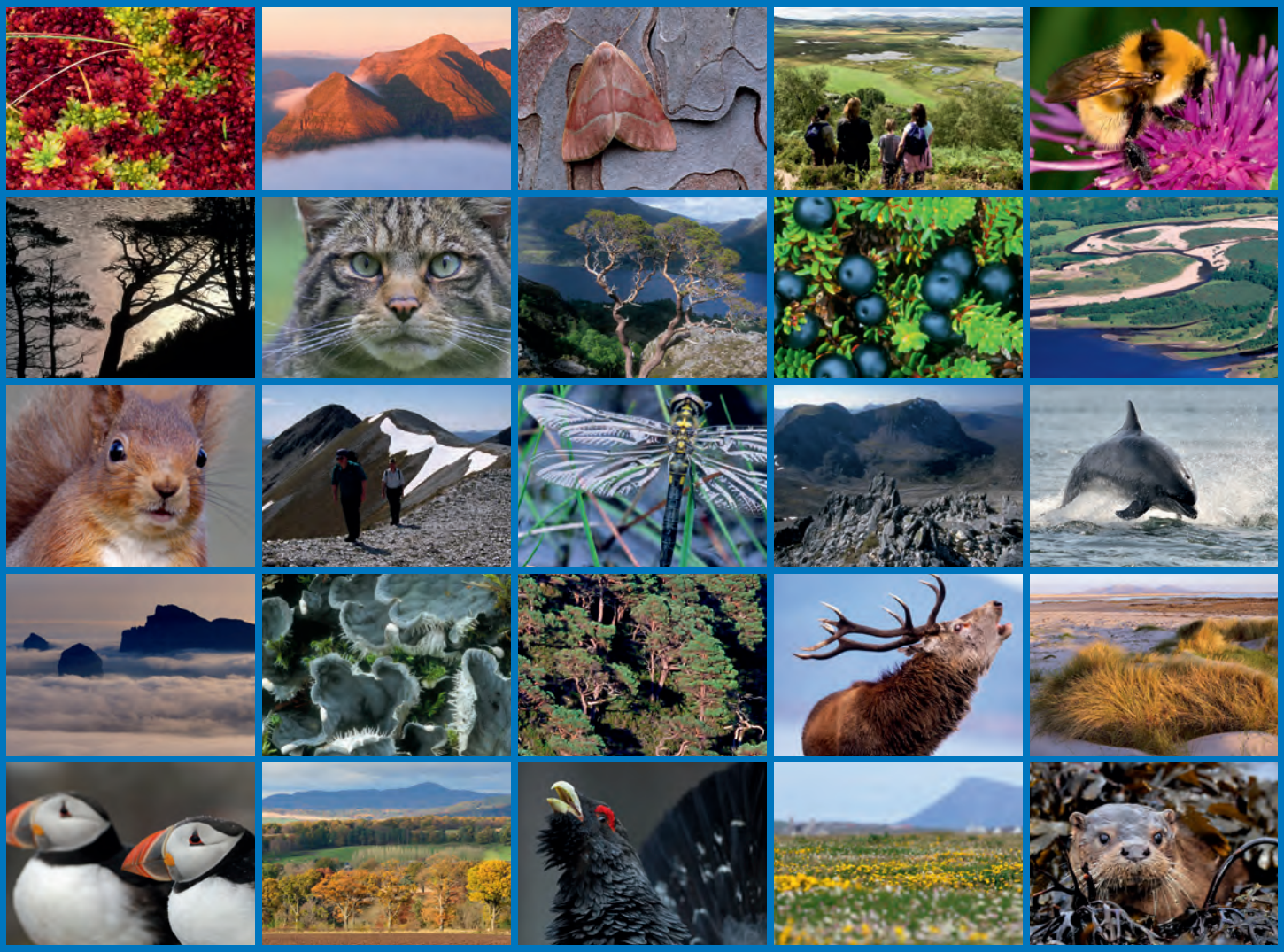
Scottish Natural Heritage
Commissioned Report No. 148

East Caithness Cliffs Special Protection Area (SPA) Site Condition Monitoring 2005



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COMMISSIONED REPORT

Commissioned Report No. 148

East Caithness Cliffs Special Protection Area (SPA) Site Condition Monitoring 2005

For further information on this report please contact:

Simon Foster
Scottish Natural Heritage
Great Glen House
INVERNESS
IV3 8NW
Telephone: 01463-725 000
E-mail: simon.foster@snh.gov.uk

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COMMISSIONED REPORT

Summary

East Caithness Cliffs SPA
Site Condition Monitoring 2005

Commissioned Report No: 148
Contractor : Bob Swann, North of Scotland Ornithological Services

BACKGROUND

Plots set up in 1993 were used to enable long term monitoring of five seabird species (northern fulmar, European shag, common guillemot, razorbill and black-legged kittiwake) at three SSSIs (Duncansby Head, Craig Hammel to Sgaps Geo and Berriedale Cliffs) which contain the largest colonies of seabirds within the North Caithness Cliffs and East Caithness Cliffs SPAs. There are 30 species-specific plots and 15 colony plots, in four core areas: Berriedale cliffs, An Dun area, Ires Geo area and Skirza Head. All were re-surveyed in 1999 and as part of the second cycle of the site condition monitoring programme the plots were re-surveyed in June 2005. The methods used were as per the Seabird Monitoring Handbook (Walsh *et al*. 1995) and are identical to the methods used in the 1999 survey (Callaghan *et al.* 1999).

MAIN FINDINGS

- Three counts were done at all 45 plots in 2005 (as opposed to just 2 counts at each plot in 1999).
- The results indicate that since 1999 there has been a significant 61% increase in the numbers of northern fulmars in the East Caithness Cliffs SPA, with increases at three of the core areas, and a slight decrease at one (Skirza Head).
- European shag numbers were down 72% with decreases in all four core areas. This was probably as a result of high mortality and surviving birds being in poor condition, following a large wreck of this species in spring 2005.
- Black-legged kittiwakes increased overall by 65%, with major increases in the An Dun and Ires Geo core areas, but declines at Berriedale Cliffs and Skirza Head.
- Common Guillemot numbers increased by only 3% with increases in the An Dun and Ires Geo core areas, but declines at Berriedale Cliffs and Skirza Head.
- Razorbill numbers increased overall by 81% with increases noted in all four core areas.

For further information on this project contact:
Simon Foster, Scottish Natural Heritage, Great Glen House, Inverness, IV3 8NW
Tel: 01463 725000
For further information on the SNH Research & Technical Support Programme contact:
DSU (Policy & Advice Directorate), Scottish Natural Heritage, Great Glen House, Inverness, IV3 8NW**.**
Tel: 01463 725000 or pads@snh.gov.uk

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1. INTRODUCTION

The numbers of seabirds breeding on the coasts of Britain and Ireland are of international importance. Effective conservation policies for seabirds depend on the availability of accurate and up to date information on the size and location of colonies. This has resulted in three national surveys of seabird colonies in Britain and Ireland, the most recent of which took place between 1998 and 2002 (Mitchell *et al*. 2004). All three surveys have indicated the national importance of the east Caithness Cliffs for breeding seabirds.

Monitoring plots were set up in 1993 to enable long term monitoring of five selected seabird species (northern fulmar *Fulmaris glacialis*, European shag *Phalocrocorax aristotelis*, common guillemot *Uria aalgae*, razorbill *Alca torada* and black-legged kittiwake *Rissa tridactyla*) at three SSSIs (Site of Special Scientific Interest), Duncansby Head, Craig Hammel to Sgaps Geo and Beriedale Cliffs. These SSSIs contain the largest colonies of seabirds within the North Caithness Cliffs SPA (Special Protection Area) and East Caithness Cliffs SPA. The plots are composed of 30 species-specific plots and 15 colony plots and all were re-surveyed in 1999. As part of the second cycle of site condition monitoring programme the plots required to be re-surveyed. The first cycle was completed in 2004.

This report gives details of the number of seabirds present in the monitoring plots in June 2005.

2. METHODS

2.1 Timing of counts

The plots were surveyed between 2nd June 2005 and 25th June 2005. The methods used were as per the Seabird Monitoring Handbook (Walsh *et al*. 1995). These are identical to the methods used in the 1999 survey (Callaghan *et al*. 1999), though three plot counts were done in 2005, rather than the two in 1999. The minimum gap between each plot count in 2005 was 6 days. All counts were made between 0900 and 1600 hours. To allow comparisons with previous surveys each plot was counted from the same position (as described in Callaghan *et al*. 1999) with reference to the marked photographs in Annex 2 of Callaghan *et al*. 1999.

2.2 Species methodology

Northern fulmar - Apparently occupied sites (AOS) were counted. A site is taken as occupied when there is a bird sitting tightly on a reasonably horizontal area large enough to hold an egg. Two birds on such as site, apparently paired, count as one site.

European shag - Apparently occupied nests (AON) include all substantial or well constructed nests occupied by at least one bird.

Black-legged kittiwake - Apparently occupied nests include all substantial or well constructed nests capable of holding eggs and occupied by one standing bird or a bird within touching distance of the nest.

Common guillemot and **razorbill -** All individual birds on land in the demarcated areas were counted.

3. THE MONITORING PLOTS

There are two plot types. *Colony plots* where all seabirds were counted and *single species plots*. The plots are grouped into five areas. These are Badbea, Inver Hill, An Dun, Ires Geo - Riera Geo and Skirza Head. At each plot a GPS reading was taken to identify the count point and a digital photograph was taken of the count site. Table 1 gives details of all plots, their code, their plot reference name, the species monitored and the GPS reading of the count point. The plots are arranged in the table in the order they were monitored within each colony during the 2005 survey (usually from north to south or vice versa). Those in bold are the colony plots.

Table 1. *Details of monitoring plots.*

Plot code	Colony	Study Plot ref name	GPS reading	Species monitored
BASH1	Badbea	S1	ND08838 19893	SH
BASH2	Badbea	S2a and S2b	ND08690 19539	SH
BASH3	Badbea	S3	ND08560 19455	SH
BASH5	Badbea	S4	ND08384 19234	SH
BASH4	Badbea	S5	ND08384 19234	SH
BAS1	**Badbea**	**Traigh Muile Cleite Rock**	ND08384 19234	**GU,RZ,KI,SH,FU, LB,GB**
BASH6	Badbea	S6	ND08142 19037	SH
BASH7	Badbea	S7	ND08051 18927	SH
BASH8	Badbea	S8	ND08051 18927	SH
IHS3	**Inver Hill**	**plot1**	**ND11416 21434**	**GU,RZ,KI**
IHS2	**Inver Hill**	**plot2**	**ND11357 21363**	**GU,RZ,KI,FU**
IHS1	**Inver Hill**	**plot3**	**ND10945 21046**	**GU,RZ,KI**
IHSH1	Inver Hill	S1	ND10759 20887	SH
ADSH3	An Dun	S3	ND14316 26226	SH
ADFU1	An Dun	F1	ND14314 26225	FU
ADSH2	An Dun	S2	ND14314 26225	SH
ADKI1	An Dun	K5	ND14157 25917	KI
ADS2	**An Dun**	**Plot 5**	**ND14139 25920**	**GU,RZ,FU**
ADS3	**An Dun**	**Plot 4**	**ND14139 25920**	**GU,RZ,KI,FU**
ADS1	**An Dun**	**Plots1,2,3 + extra**	**ND14135 25895**	**GU,RZ,KI,FU**
ADKI2	An Dun	K4	ND14135 25895	KI
ADKI5	An Dun	K3	ND14068 25681	KI
ADFU4	An Dun	F4	ND13912 25590	FU
ADKI3	An Dun	K1	ND13912 25590	KI
ADRA1	An Dun	R1	ND13912 25590	RZ
ADFU2	An Dun	F3	ND13953 25499	FU
ADFU3	An Dun	F2	ND13953 25499	FU
ADKI4	An Dun	K2	ND13953 25499	KI
ADSH1	An Dun	S1	ND13953 25499	SH

Plot code	Colony	Study Plot ref name	GPS reading	Species monitored
IGS1	**Ires Geo**	**Repeat census site 2**	**ND35769 45564**	**GU,RZ,KI,FU**
IGFU1	Ires Geo	F4 & F5 combined	ND35769 45564	FU
IGSH1	Ires Geo	shag plot	ND35769 45564	SH
IGFU2	Ires Geo	F3	ND35861 45517	FU
IGKI1	Ires Geo	K4	ND35891 45479	KI
IGK2	Ires Geo	K1+K2	ND35755 45122	KI
AGS1	**Ashy Geo**	**Ashy Geo arch Plot**	**ND35802 44990**	**GU,RZ,KI,FU**
AGFU1	Ashy Geo	F1	ND35673 44861	FU
TGS1	**Tod's Gote**	**Tod's Gote**	**ND35670 44690**	**GU,RZ,KI,FU**
BGFU1	Broad Geo	F1	ND35327 44292	FU
BGSH1	Broad Geo	Shag Plot	ND35327 44292	SH
RGS1	**Riera Geo**	**Riera Geo**	**ND35324 43831**	**GU,RZ,KI,FU**
SKS1	**Skirza Head**	**North Plot**	**ND39464 68456**	**GU,RZ,KI,FU**
SKS2	**Skirza Head**	**Ledge Plot**	**ND39464 68456**	**GU,RZ,KI**
SKS3	**Skirza Head**	**south plot1**	**ND39421 68181**	**GU,RZ,KI**
SKS4	**Skirza Head**	**South plot2**	**ND39421 68181**	**GU,RZ,KI**

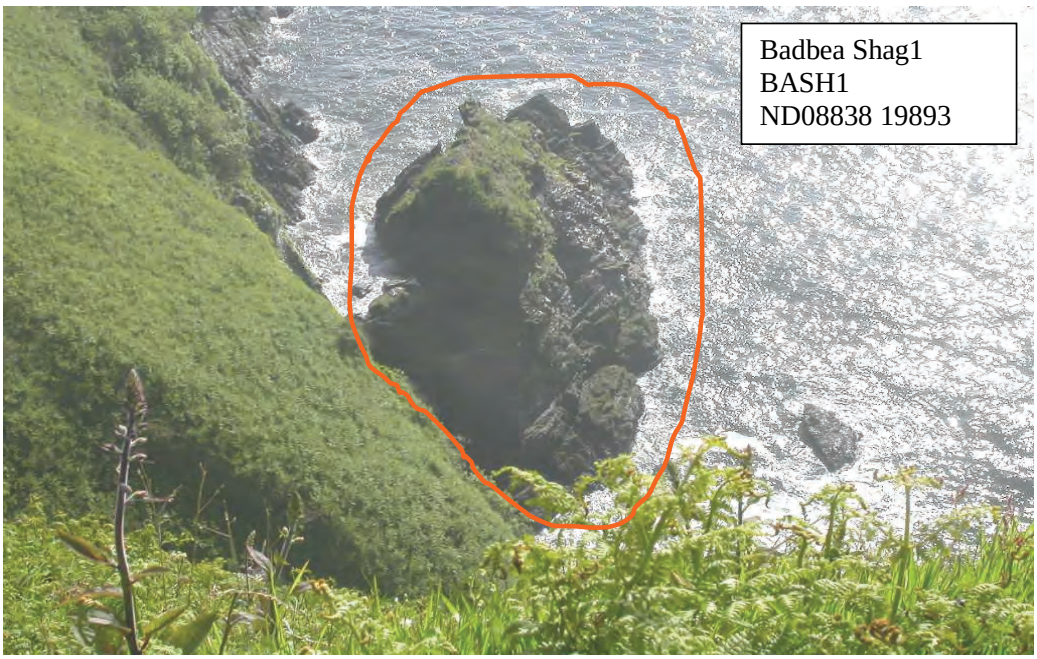
Details are presented of each plot including an annotated photograph of the exact counting area, as well as the GPS position of the counting site, the plot code and the plot reference name (to allow comparisons with previous censuses).

The order used is the order given in table 1.

3.1 Badbea

BASH1. Badbea S1

The count point is on the first headland south of the burn south of the monument. The count site is located on the west side of the large rock immediately below the monument. Count all of the west side of the rock and the south-east facing side.

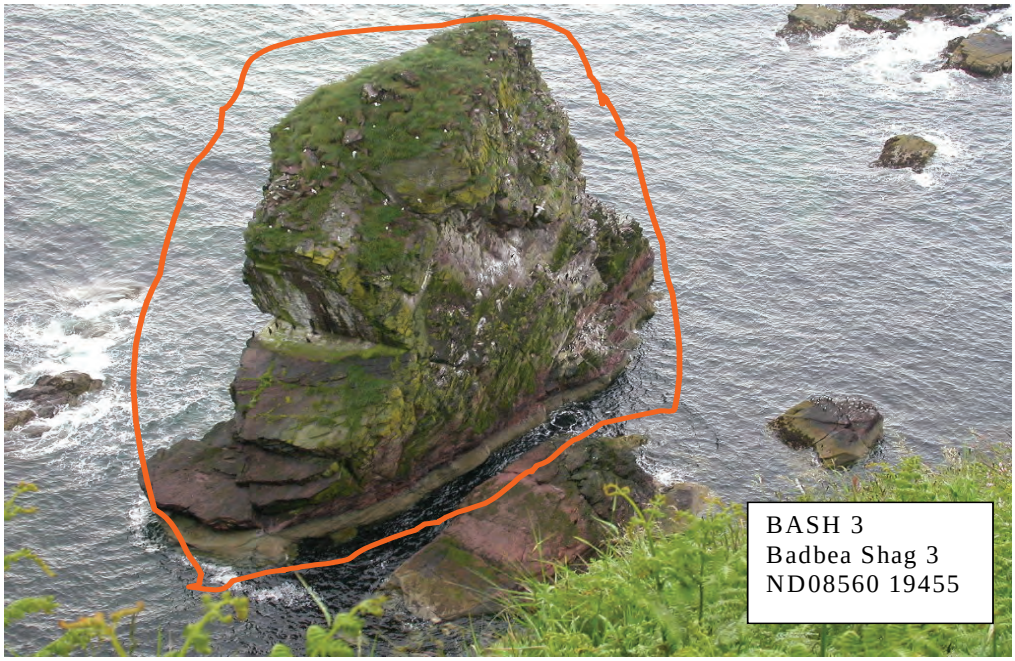


BASH2. Badbea S2a and S2b

Follow the fence south and over a gate. The count point is located down the slope from the fence at the first corner from the gate on a large headland. Count all of the cliff face in the mainland from the tip to the beach on the left side (2a) and the south-east face of the first rock on the shore (2b).

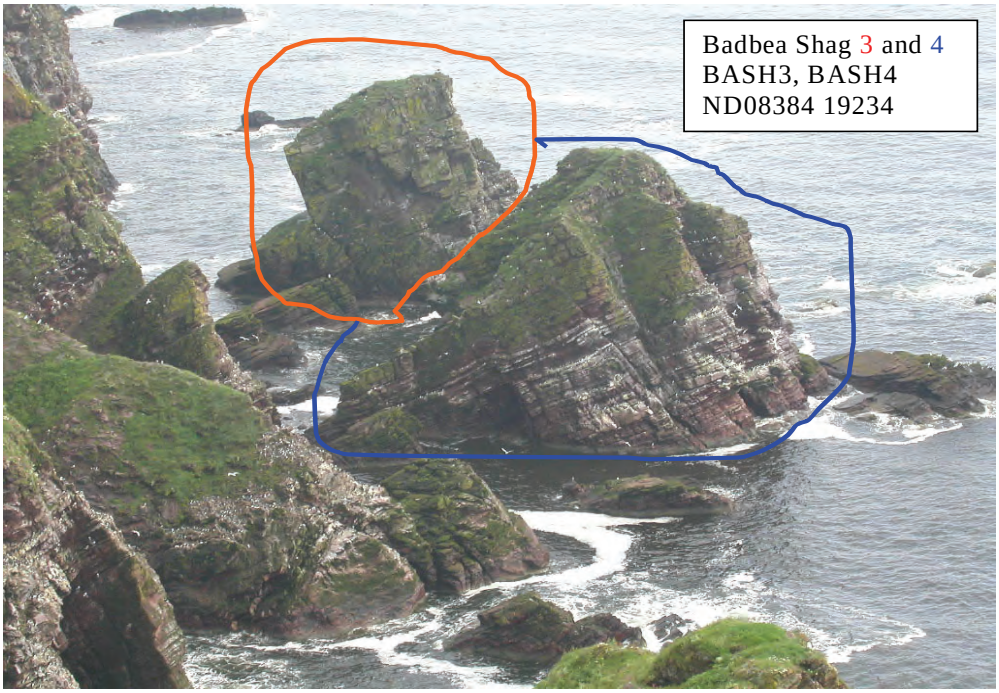
BASH3. Badbea S3

The count point is located below the village area south-west of the count site, below a ruined building. Count all the south facing side of the rock.



BASH4. Badbea S4

Continue south along the fence line, going round a large gully. The count point is at the tip of the headland, beyond the gully, above some gorse. It is above and just south-west of Traigh Muidhe Cleite Rock. Count all of the south-east facing area of rock (which is directly north of shag monitoring plot 5). A telescope is required.

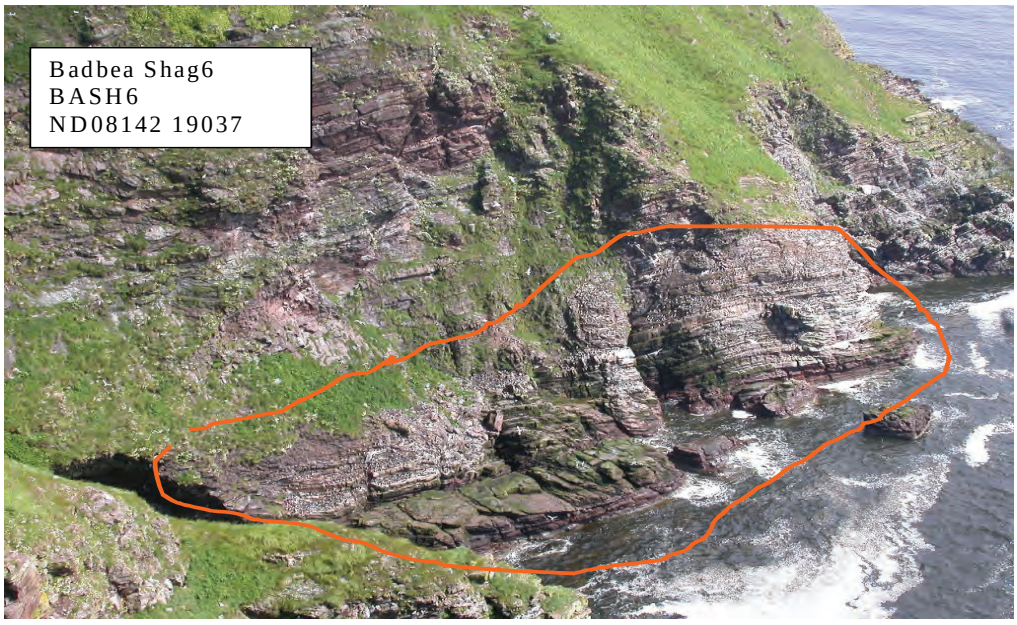


BAS1 and BASH5. Badbea Traigh Muide Cleite Rock and Badbea S5

The count point is located above and just south-west of the rock (and is the same CP as for BASH4). The whole south-west side of the rock should be counted, as seen from the view site.

BASH6. Badbea S6

Follow the fence south along the cliff edge above the next large gully. After the gully the fence turns left at 90º. Follow it down to the headland below the fence (and above the needle). Go down the needle slope on the north side until the cave on plot 6 is directly opposite. The count site is located at the bay north of the needle. Count all of the main face to the north corner.



BASH7. Badbea S7

Follow the fence south to the next point. The counting point is located on the slope directly below the metal fencing post. The count site is located on the south-facing slope and includes the needle. Count all of the face from the needle to the left side.

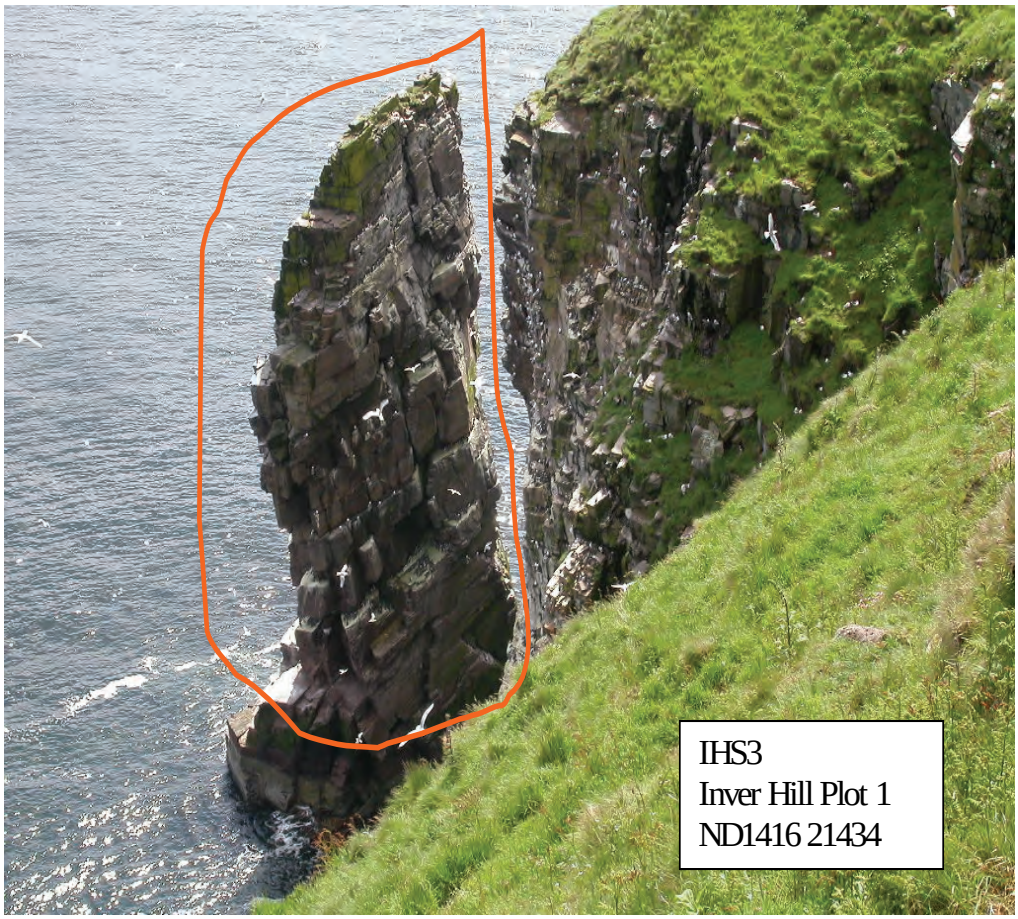
BASH8. Badbea S8

The count point is as for S7 above. The count site is located at the flat area of rock to the south of the needle. The boundary is defined by the northern edge of the flat area of rock and the edge of the slope going up from the flat rock. Count all of the area visible from the count point.

3.2 Inver Hill

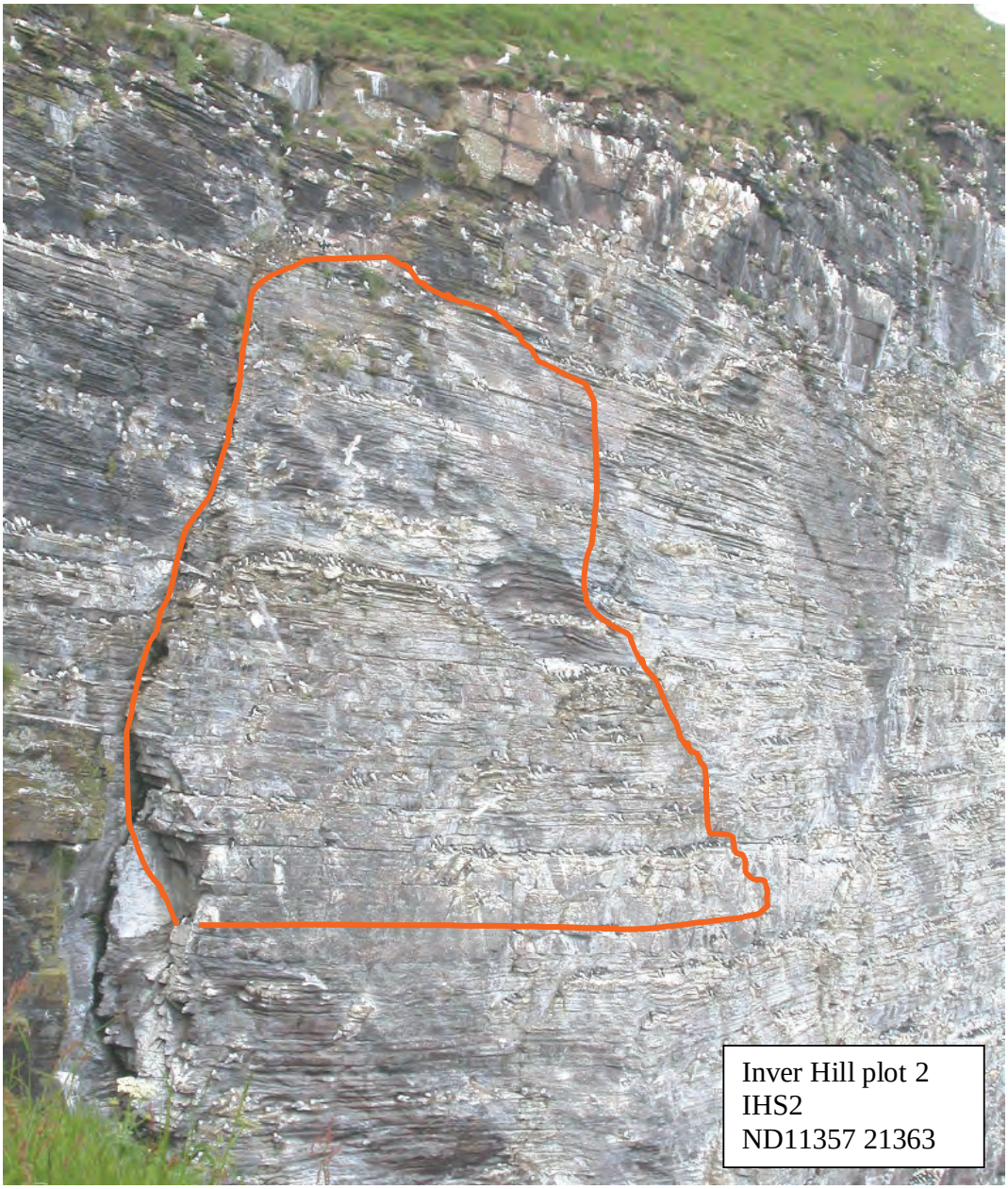
IHS3. Inver Hill plot 1

The count point is on the mainland to the north east of the stack, between it and Leac Gheal. The count site is located on the stack on the northern side of Inver Hill.



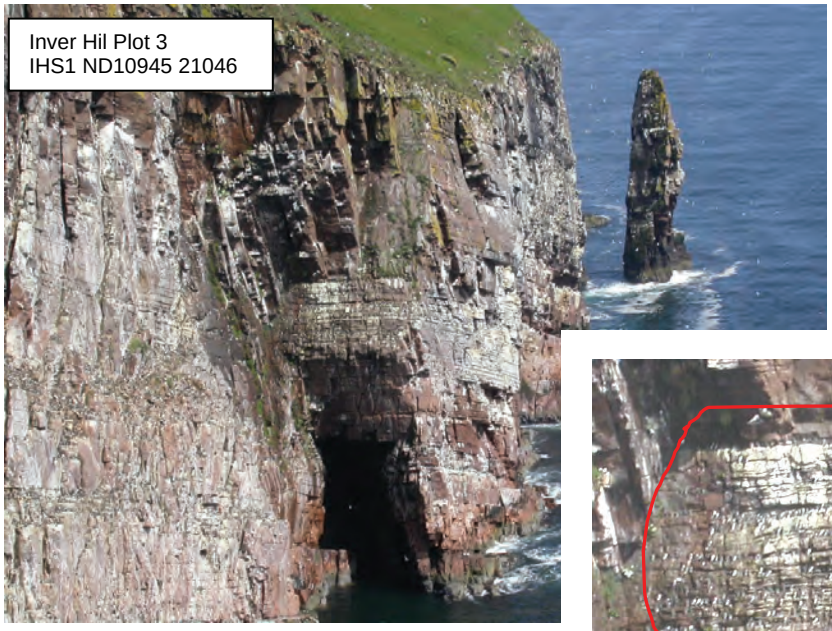
IHS2. Inver Hill plot 2

The count site is located on the mainland at a small bay formed at the top of the slope above the stack at Inver Hill. It is the closest part of the cliff from the count point and is located below a large rock with a cross on it. The photograph shows the cracks and ledges that form the boundary of the plot.



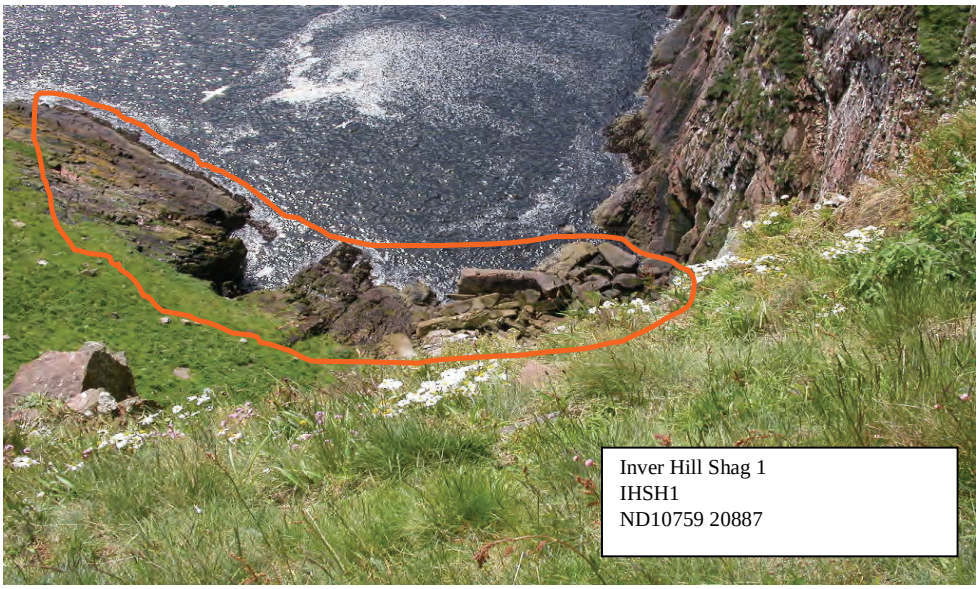
IHS1. Inver Hill Plot 3

The count point is the cliff top north-east of Boch ailean at Leac Gilong. The count site is on a south-west facing area of cliff. It is the section of smooth cliff directly above a cave.



IHSH1. Inver Hill Shag 1

The count point is on the southern tip of Boch Ailean. The count site is a south west facing area of cliff in the bay formed at the southern tip of Boch Ailean.



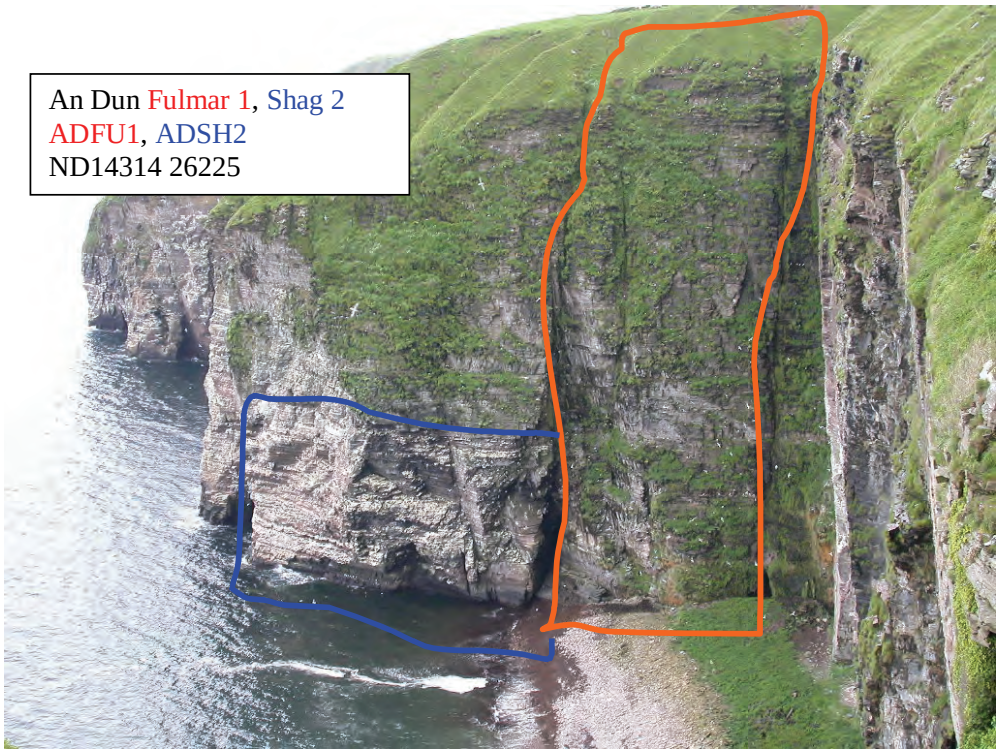
3.3 An Dun

ADSH3. An Dun Shag 3

The count point is the tip of Coan Dubh and the count site is the cliff face of Badaih na Gaoithe about 1km north. A telescope is required for counting.

ADFU1. An Dun Fulmar plot 1

The count site is the north-east side of Coan Dubh, from the large joint on the right to the joint at the end of the beach. The count point is the headland directly opposite to the north-east.

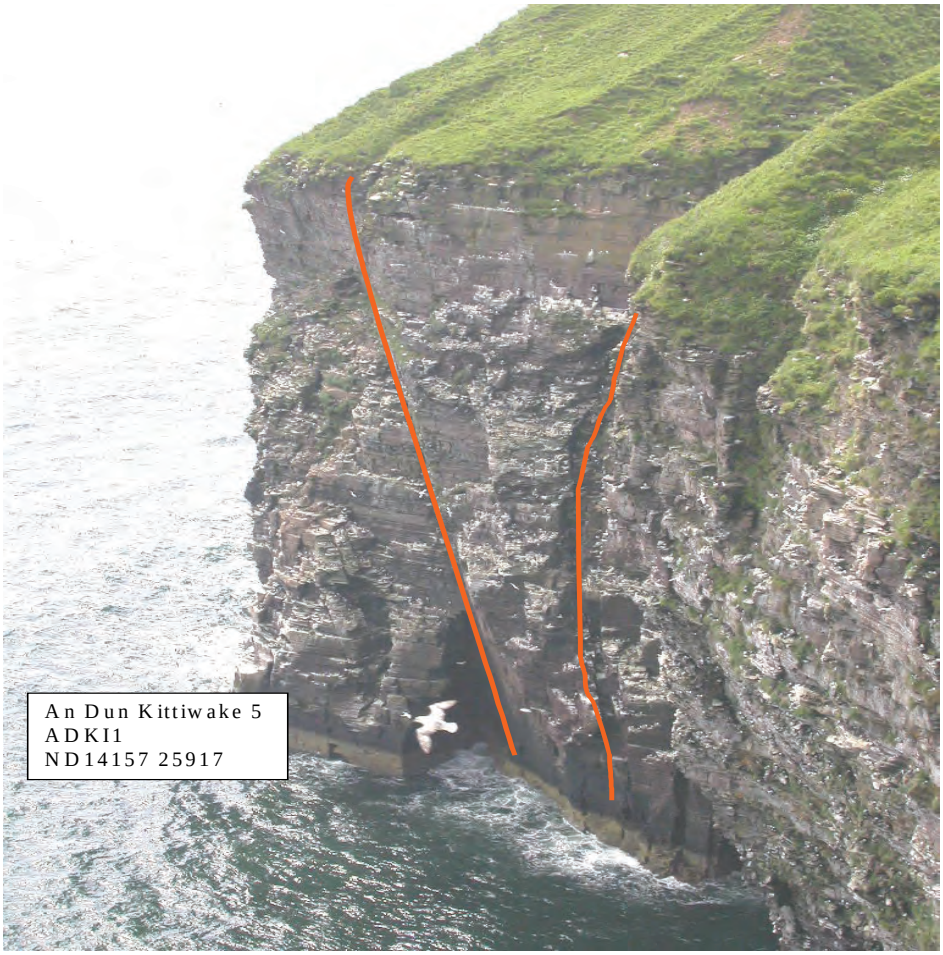


ADSH2. An Dun Shag 3

The count point is as for ADFU1. The count site is from the large joint at the end of the beach to the outer corner.

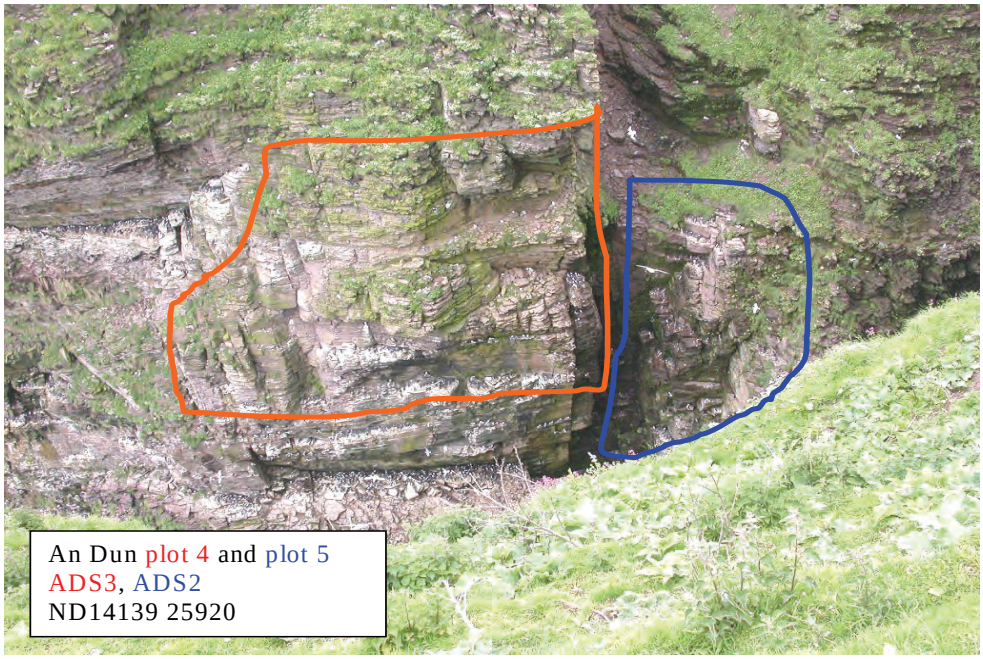
ADKI1. An Dun K5

The count site is the north-east side of An Dun, viewed from the southern tip of Coan Dubh Head. Count from the diagonal crack on the left that runs from the sea to cliff top to a "bendy" crack on the right as per the photograph below.



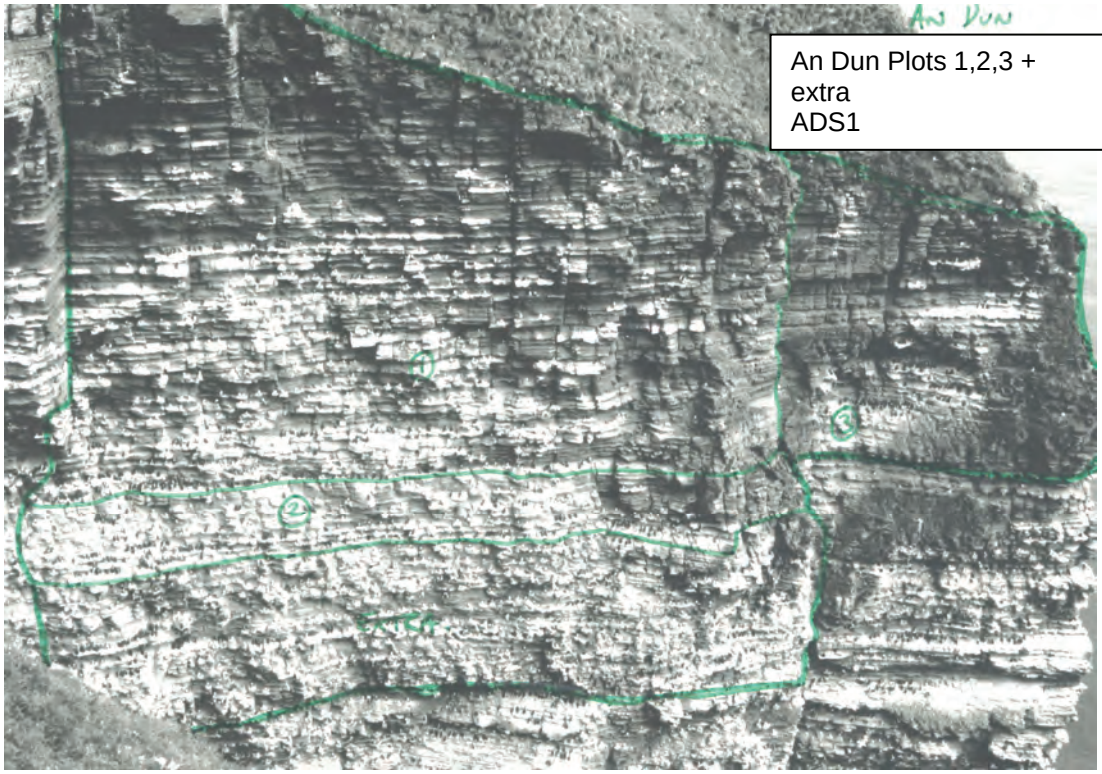
ADS2 and ADS3. An Dun Plot 4 (ADS3) and An Dun Plot 5 (ADS2)

The counting point is the south tip of Coan Dubh Head. The plot is on the south side of the first small geo north of An Dun. Plot 4 is from the dark water washed area to the join formed at the grassy slope on the left. Plot 5 is on the right hand side of the water washed area.



ADS1. An Dun plots 1,2, 3 + extra

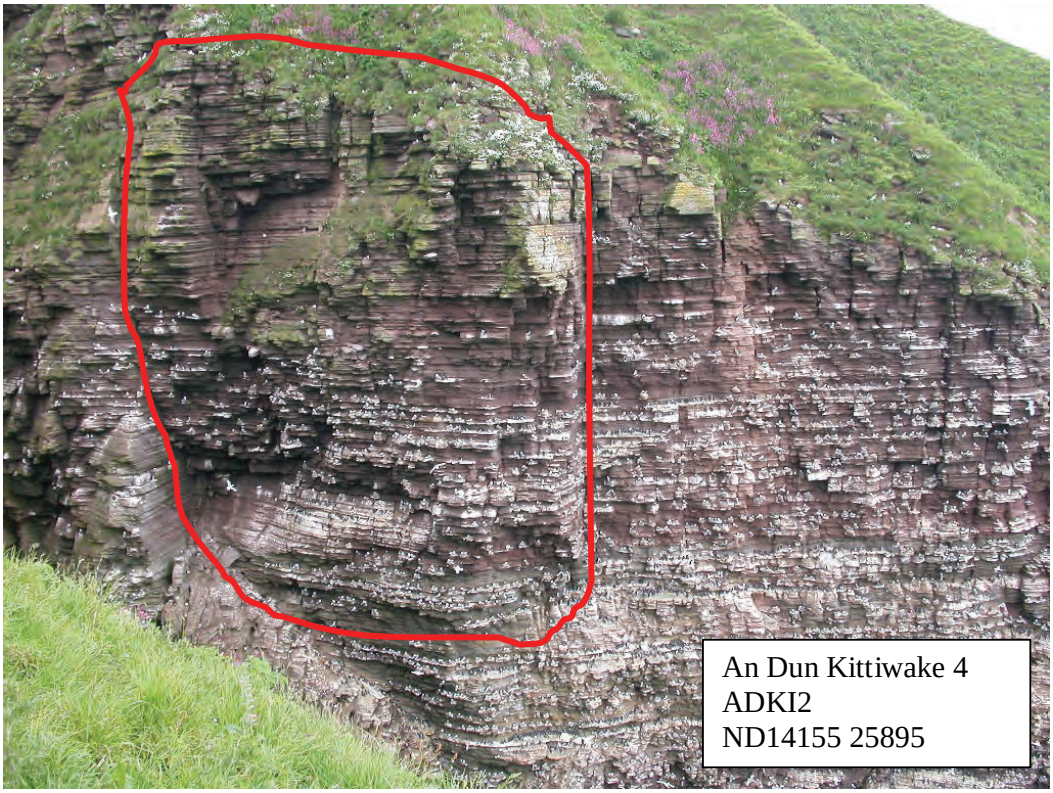
The counting point is located on the south side of the small geo to the north of An Dun. Count the north side of the geo from the edge of the cliff on the right to the small join just left of the large square rock at the top of the cliff. The bottom of the section is below a horizontal joint with guillemots along it and above a broad ledge with guillemots.



An Dun Plots 1,2,3 + extra
ADS1

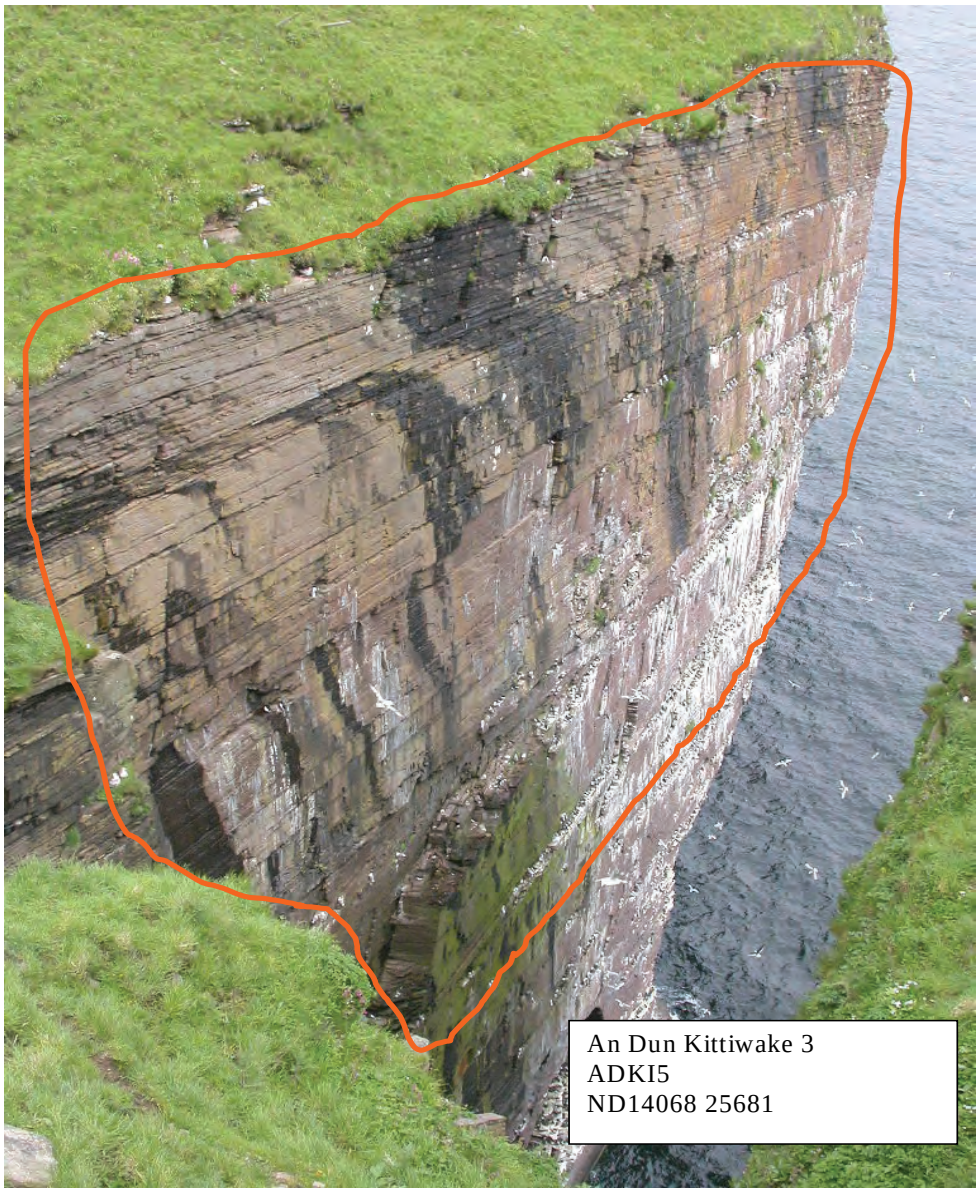
ADKI2. An Dun Kittiwake plot 4

The counting point is located on the south side of the small geo to the north of An Dun containing plot ADS1. The count site is bounded on the right by a small join on the cliff next to the large square rock (the boundary of ADS1). The left boundary is the edge of lower indent on the left up to the top of the cliff. The lower boundary is a bare area of greyish rock (below a line of kittiwakes).



ADKI5. An Dun Kittiwake 3

The counting point is located on An Dun. Follow the path onto An Dun and stop when the whole face is visible. The count site is on the north-west side of the gully. Count from the top of the cliff face to just below the ledge that goes from one end of the cliff face to the other.



ADFU4. An Dun Fulmar 4

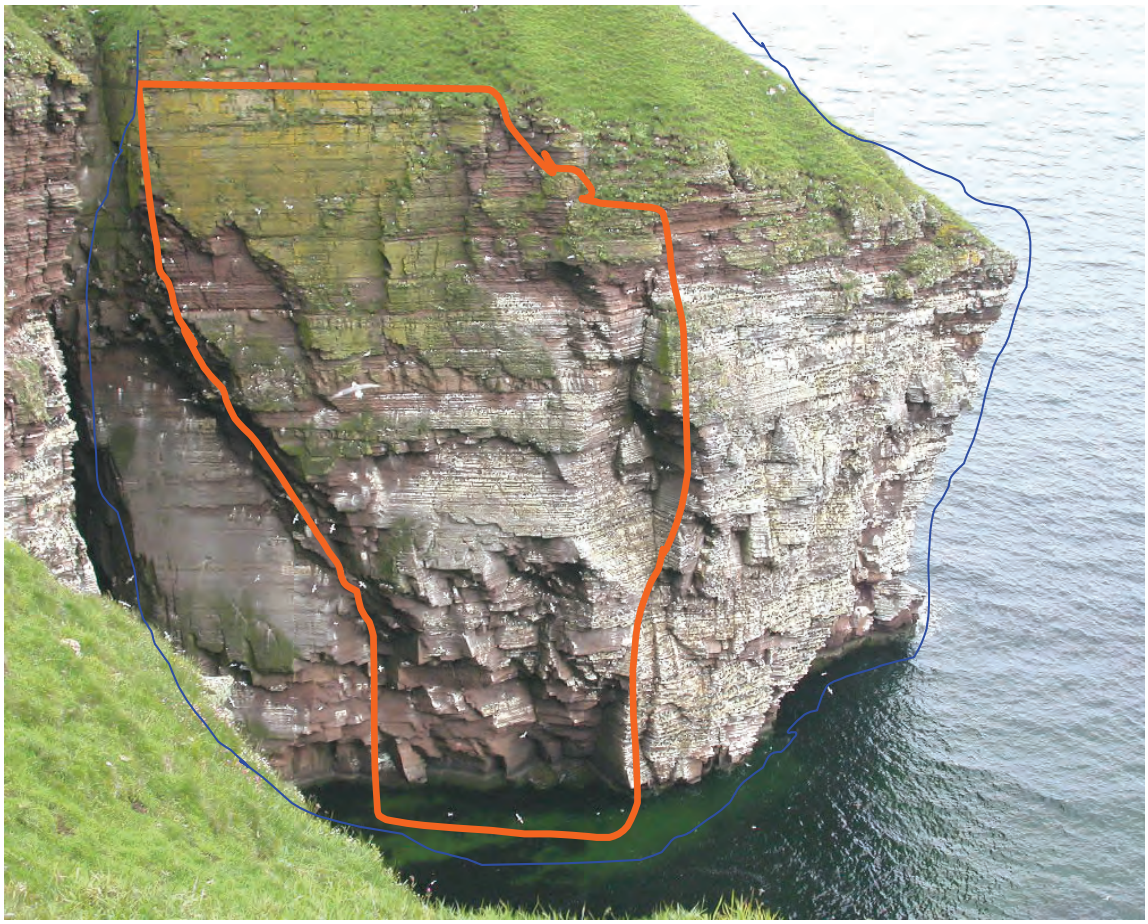
The count point is located south of An Dun on the mainland. Count the entire south facing side of An Dun up to the boundary with ADFU2.

ADKI3. An Dun Kittiwake1

The count point is located south of An Dun on the mainland. Count the entire south facing side of An Dun.

ADRA1. An Dun Razorbill 1

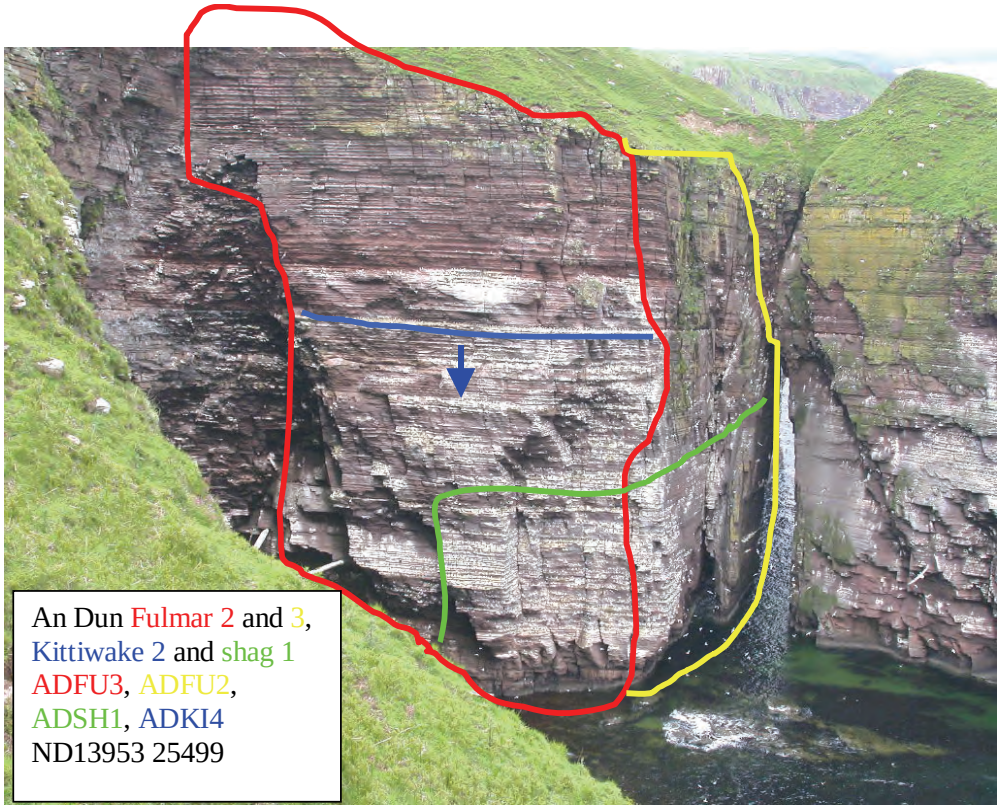
The count point is located south of An Dun on the mainland. The count site is the southern side of An Dun. The count section is located as follows; from the right hand end of An Dun go left until a joint in the rock is present. This forms the right hand boundary. Continue to the next joint, which forms the left hand boundary.



An Dun Razorbill 1, Kittiwake 1 and Fulmar 4
ADRA1, ADFU4 and ADKI3
ND13912 25590

ADKI4. An Dun Kittiwake 2

The count point is located south of An Dun on the mainland. The count site is on the mainland section of cliff next to An Dun. Count from corner at right side, where there is a small joint to the large joint on the left. The upper boundary is the second horizontal joint from the top.



ADFU3. An Dun Fulmar 2

The count point is located south of An Dun on the mainland. The count site is on the mainland section of cliff next to An Dun. Count from the joint on right hand edge of the cliff to joint on the left hand edge.

ADFU2. An Dun Fulmar 3

The count point is located south of An Dun on the mainland. The count site is on the mainland section of cliff that faces east. The site is from the gap between An Dun and the mainland to the boundary with ADFU3.

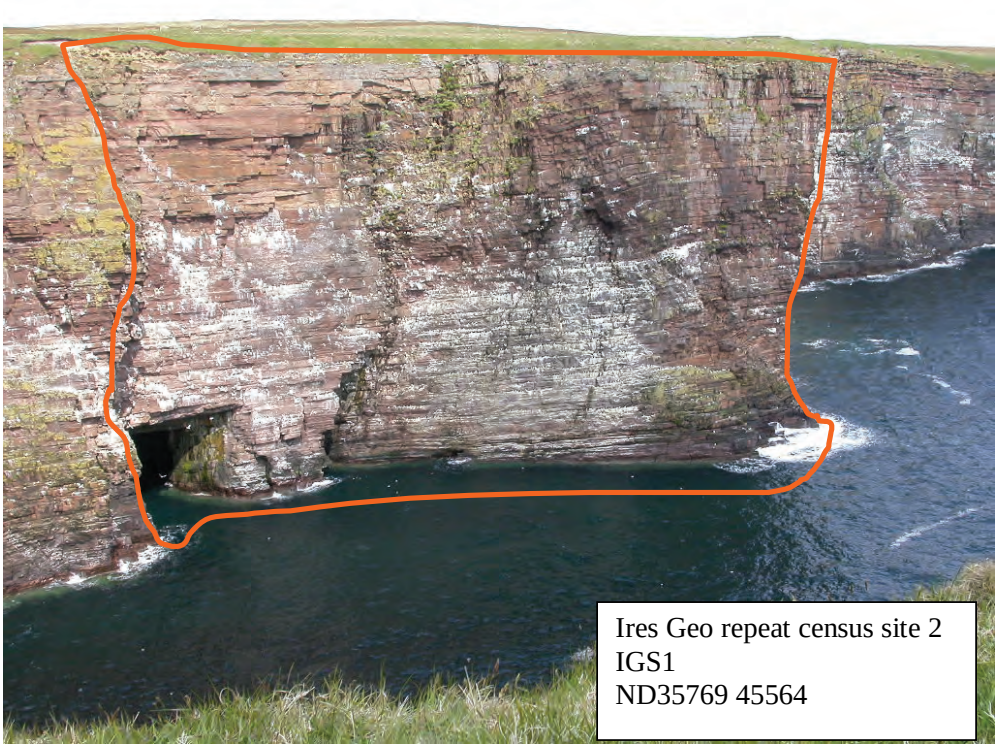
ADSH1. An Dun Shag 1

The count point is located south of An Dun on the mainland. The count site is the lower third of the mainland section of the cliff.

3.4 Ires Geo

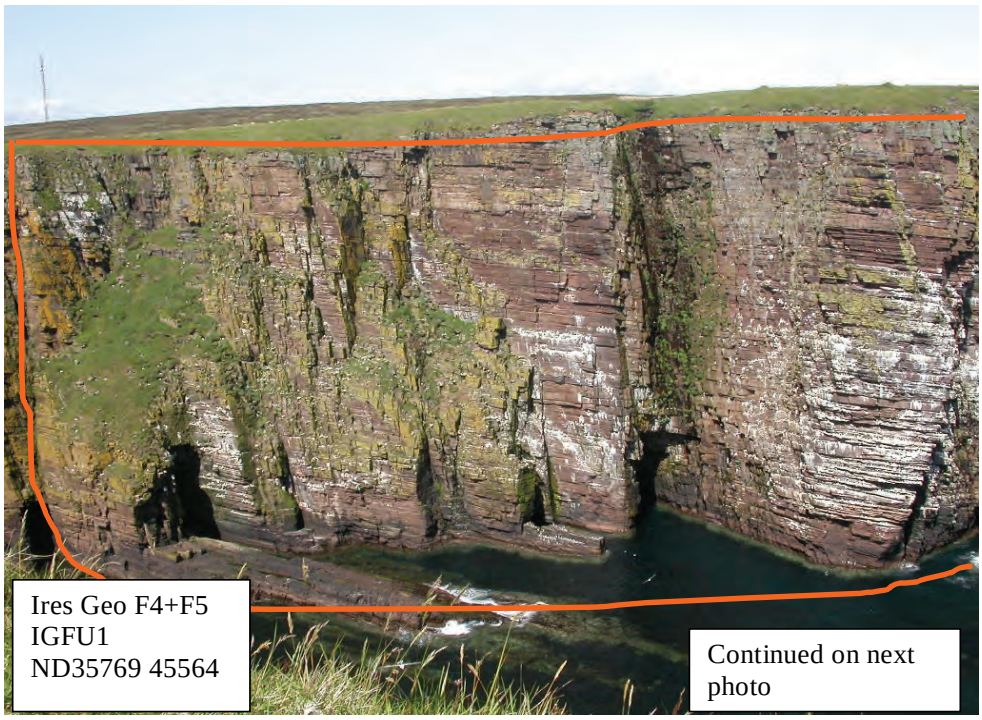
IGS1. Ires Geo (Repeat census site 2)

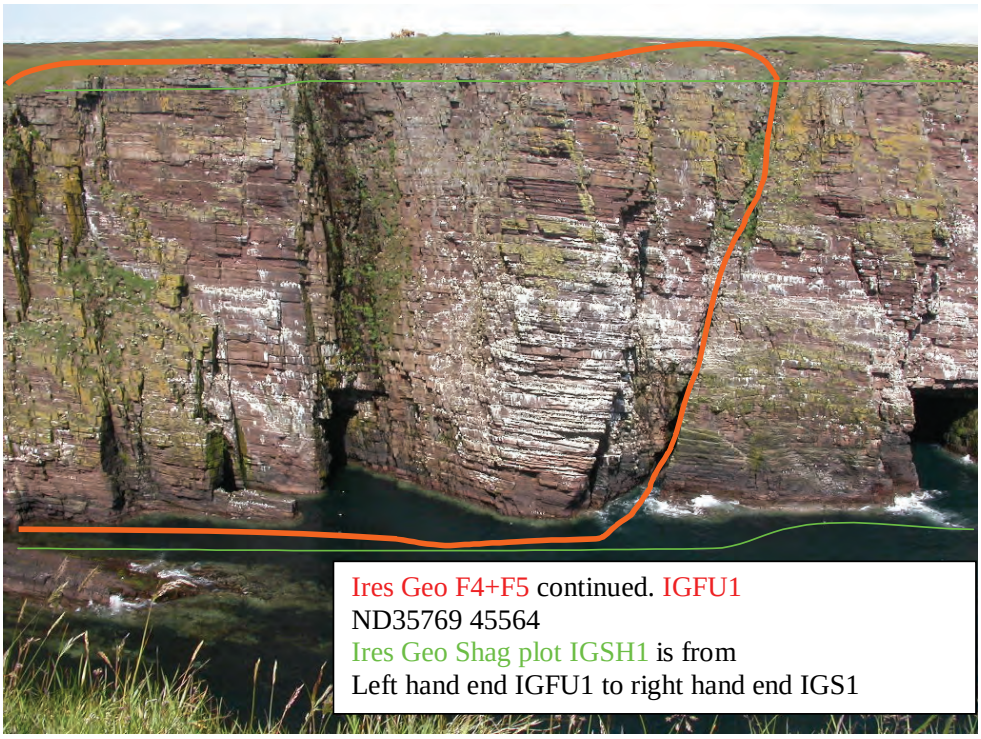
The count point is on the tip of the south side of Ires Geo. The count site is the north side of the geo from the inner edge of a rectangular cave to the outer corner.



IGFU1. Ires Geo Fulmar 4 and 5 combined

The count point is on the tip of the south side of Ires Geo. The count site is the entire cliff from the obvious joint to the left of the cave to the grassy slope.





IGSH1. Ires Geo Shag plot

The count plot is the north side of the geo from the left hand end of the Fulmar plot (IGFU1) to the right hand end of the colony plot (IGS1).

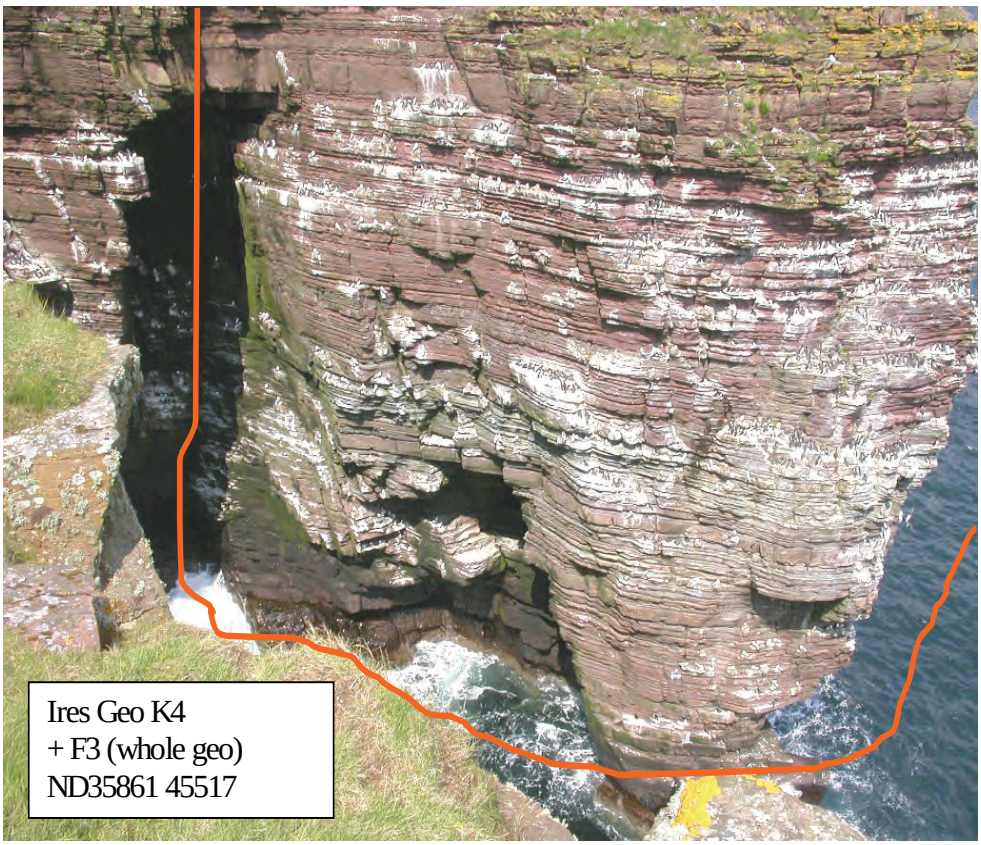
IGFU2. Ires Geo Fulmar plot 3

The count site is located around ND35861 45517. Go south from the Ires Geo CP along the cliff edge till you come to a small geo. Count all the fulmars on the north and south sides of this geo.

Ires Geo fulmar plot 3
IGFU2
ND35861 45517

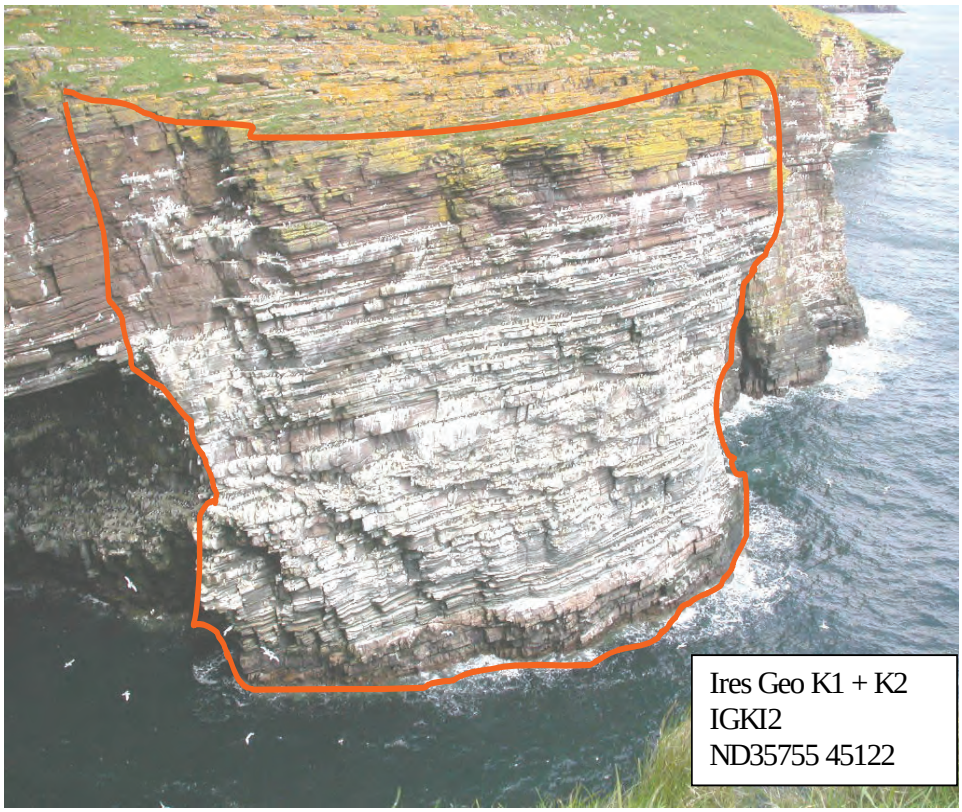
IGKI1. Ires Geo Kittiwake 4

The count point is located on the southern tip of the small Fulmar geo. The count site is the north side of the Fulmar geo from its outer edge to the cave in the middle of the geo.



IGKI2. Ires Geo Kittiwake 1+2

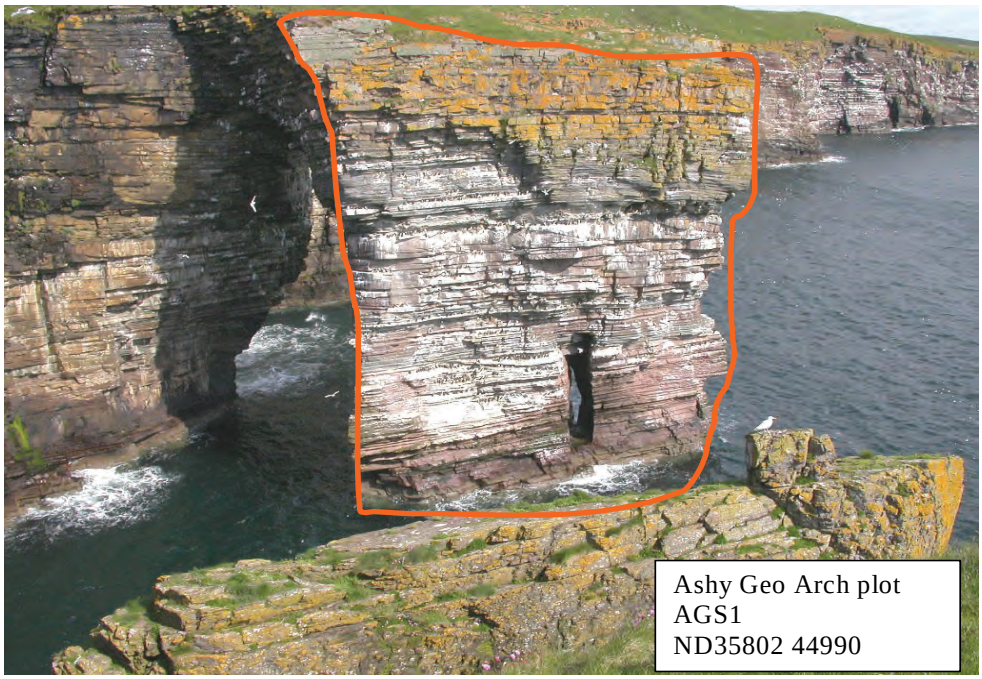
The counting point is on the second headland north of the Ashy Geo arch, next to a large strainer post. The counting site is located in the bay to the north. Count from the right side of the plot to the cave at the left hand side.



3.5 Ashy Geo

AGS1. Ashy Geo Arch plot

The counting point is located on the south side of the geo opposite the arch. The entire arch is counted (including the grassy top) from the crack at the left hand side.



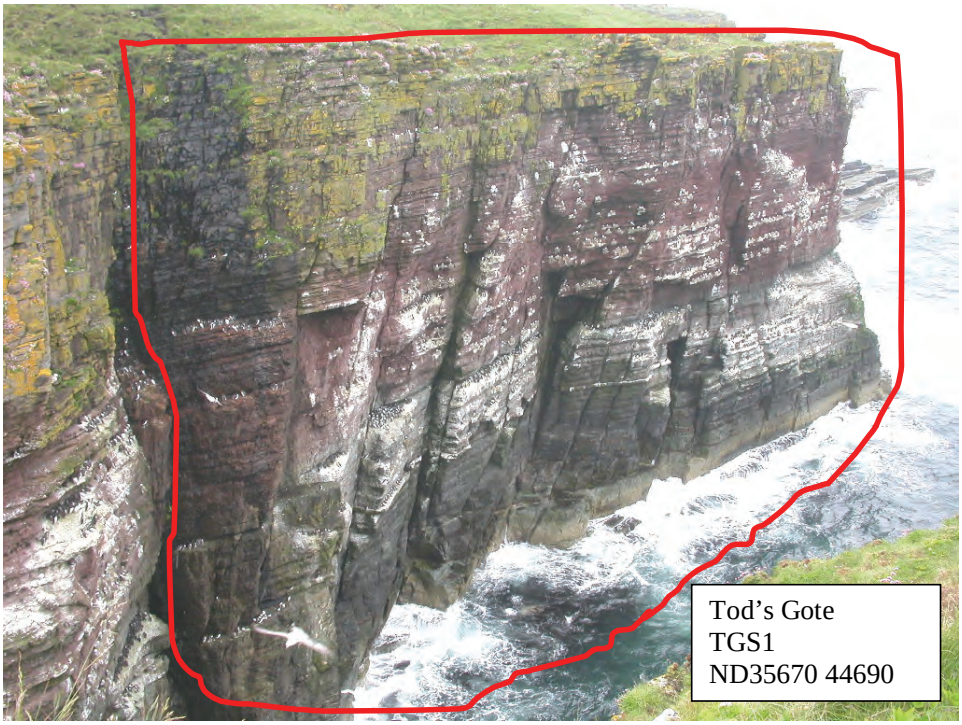
AGFU1. Ashy Geo Fulmar plot

The count site is the whole of the north side of the geo (around ND35673 44861).

3.6 Tod's Gote

TGS1. Tod's Gote

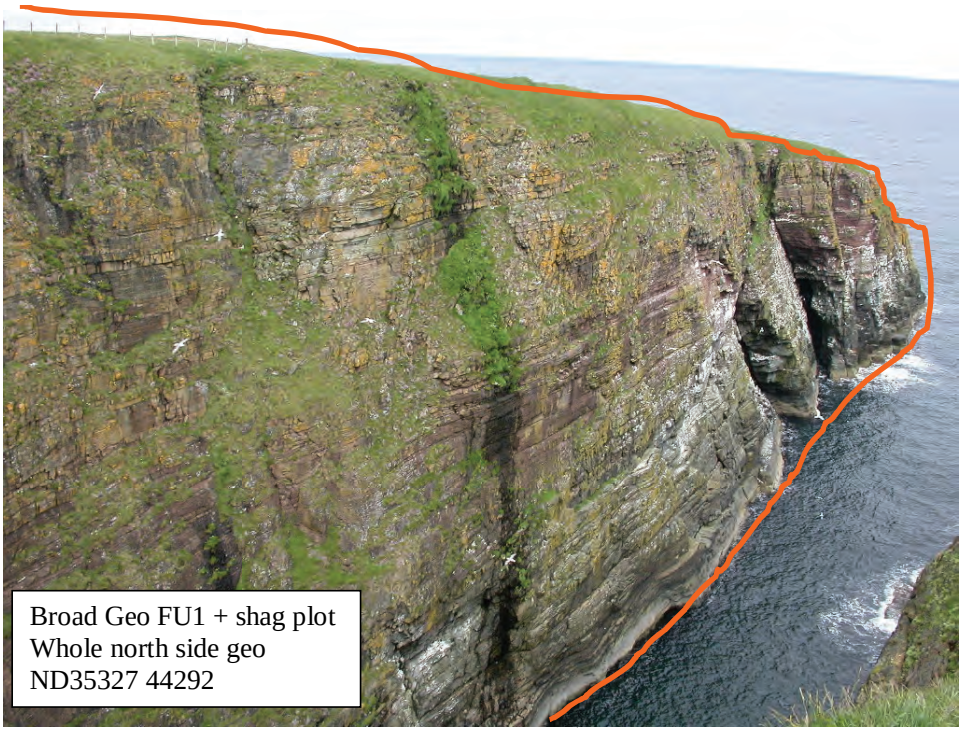
The count site is at the southern tip of Tod's Gote on the lower rock and grass outcrop. The count site is the north side of Tod's Gote from a water washed streak at the inner corner where the geo becomes constricted towards the outermost corner.



3.7 Broad Geo

BGFU1 Broad Geo Fulmar and BGSH1 Broad Geo Shag plot

The count site is the whole north side of the geo.

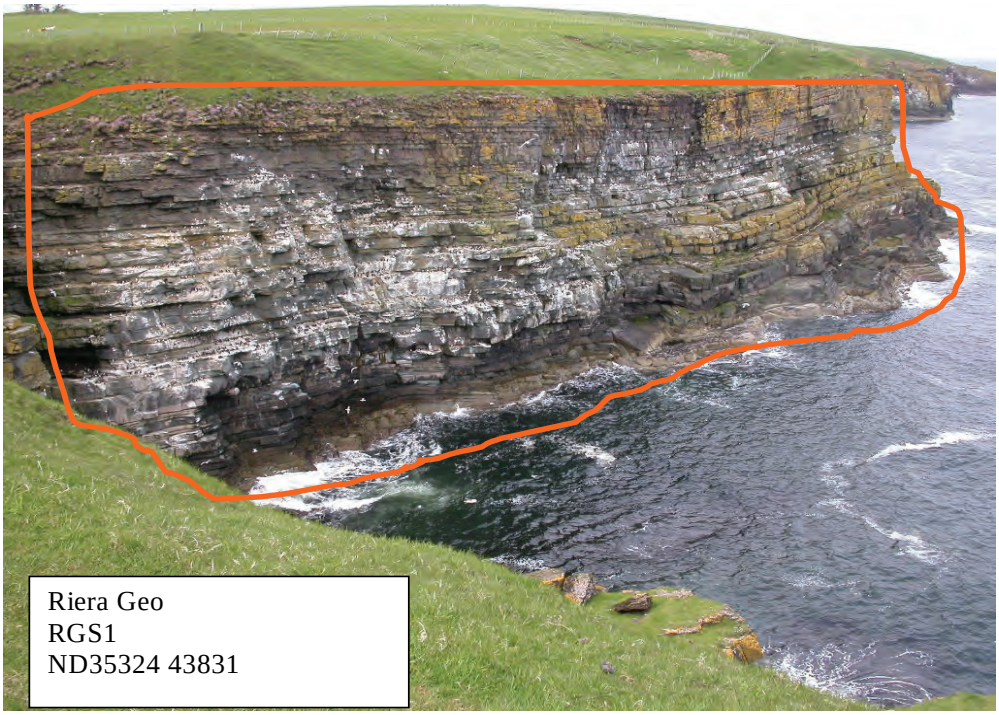


Broad Geo FU1 + shag plot
Whole north side geo
ND35327 44292

3.8 Riera Geo

RGSl. Riera Geo

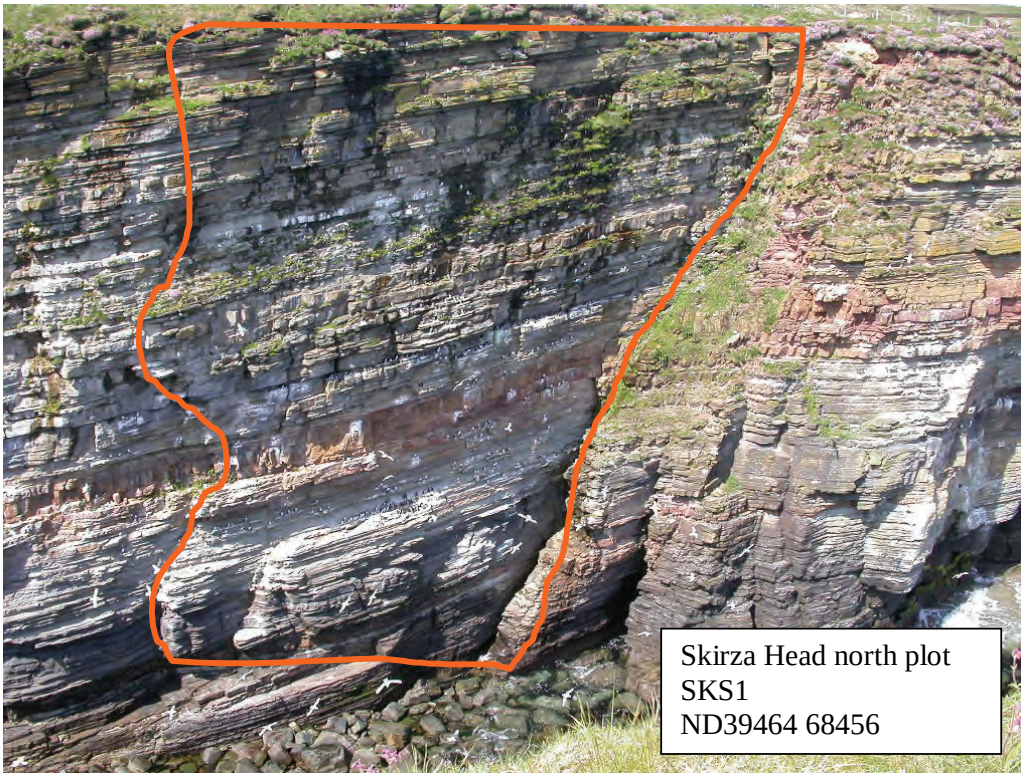
The count point is at the tip of the south side of the geo on the lower boulder and grass outcrop. The count area is the north side from the outer corner point into the corner where the geo gets constricted.

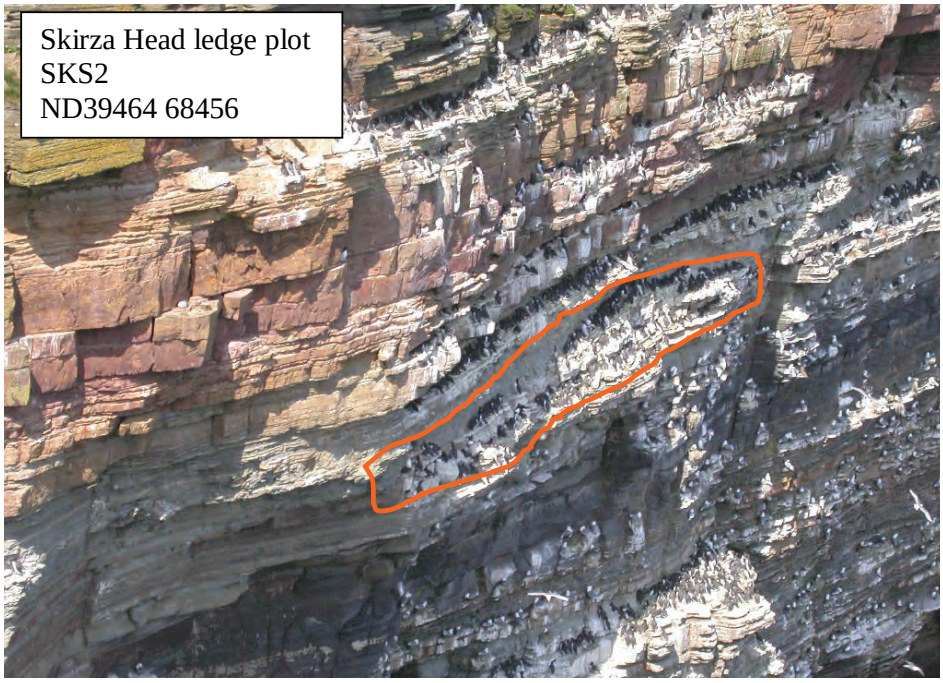


3.9 Skirza Head

SKS1. Skirza Head North plot

The count site is located on the tip of the headland that has a broch at its base. Beware the large blowhole! The count site is directly opposite and extends from a large joint that extends vertically and diagonally right to a small joint on the left that extends from the sea to the cliff top.



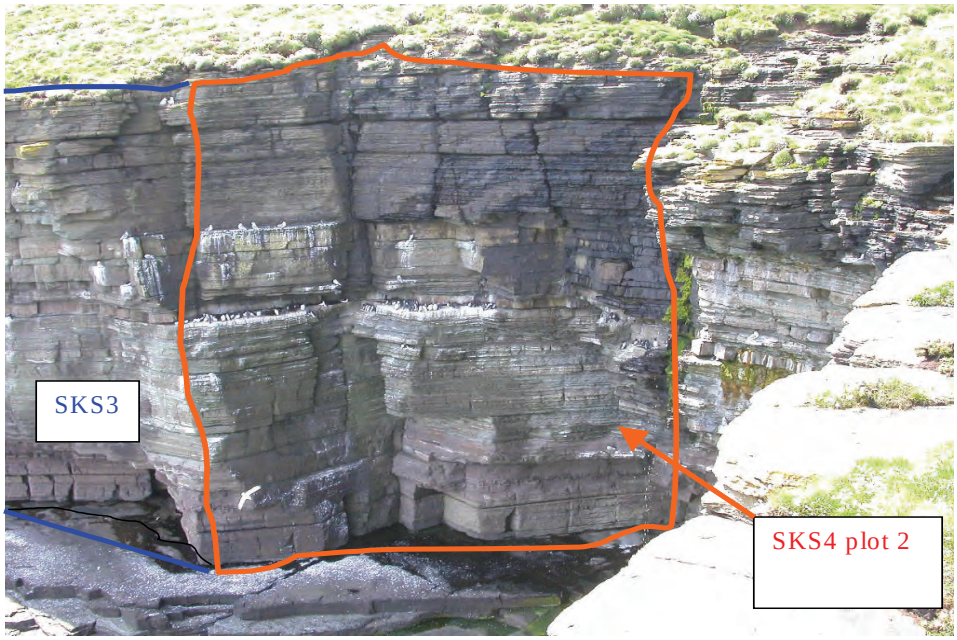


SKS2. Skirza Head ledge plot

The count site is located to the right of the north plot and is immediately above the first of three caves, which have an even spacing from the count point. See photograph.

SKS3. Skirza Head south plot 1 and south plot 2 (SKS4)

The counting point is located on the north side of a bay at the southern most point of Skirza Head. It is a large area of yellow lichen covered rock immediately opposite the plots. The count sites can be seen in the photographs below.



4. RESULTS

The results from all visits to each monitoring plot are given on the monitoring plot record cards in Appendix 1. Details are also given of dates, time of visit and weather and sea states during each visit. All plots bar An Dun K5 were counted on three occasions at least 5 days apart. An Dun K5 was not counted on visit 1 due to uncertainties over the count boundary. This was overcome on visit 2 when the nominated officer was present and the boundaries were explained.

Table 2 gives a summary of the count information for the 15 colony plots and table 3 gives a summary of the 30 species plots.

Table 2. *Summary of data collected from colony monitoring plots*

	Badbea Traigh Muidhe Cleite			Inver Hill plot 1		
Visit date	*03/06/2005*	*15/06/2005*	*21/06/2005*	*04/06/2005*	*16/06/2005*	*22/06/2005*
GU	1179	1309	1097	415	443	366
RA	97	150	122	35	40	37
KI	30	35	36	0	0	0
FU	31	31	28	0	0	0
SH	0	1	1	0	0	0
LB	2	1	1			
HG	8	4	4			
GB	1	1	1			
	Inver Hill plot 2			Inver Hill plot 3		
Visit date	*04/06/2005*	*16/06/2005*	*22/06/2005*	*04/06/2005*	*16/06/2005*	*22/06/2005*
GU	364	420	383	473	509	460
RA	34	34	24	4	4	4
KI	29	33	34			
	An Dun plots1-3+			An Dun plot 4		
Visit date	*05/06/2005*	*14/06/2005*	*23/06/2005*	*05/06/2005*	*14/06/2005*	*23/06/2005*
GU	784	806	866	187	158	197
RA	156	190	165	37	39	22
KI	475	517	587	32	34	38
FU	37	45	39	15	17	22
	An Dun plot 5			Ires Geo		
Visit date	*05/06/2005*	*14/06/2005*	*23/06/2005*	*06/06/2005*	*19/06/2005*	*25/06/2005*
GU	128	123	92	1592	1706	1745
RA	7	2	3	309	306	397
KI				301	306	290
FU	1	1	1	14	18	21
	Ashy Geo arch plot			Tod's Gote		
Visit date	*06/06/2005*	*17/06/2005*	*24/06/2005*	*06/06/2005*	*17/06/2005*	*24/06/2005*
GU	548	601	578	1174	1217	1139
RA	101	118	137	80	87	104
KI	95	102	102	274	281	289
FU	7	6	7	5	5	5
	Riera Geo					
Visit date	*06/06/2005*	*17/06/2005*	*24/06/2005*			
GU	1759	1613	1541			
RA	291	241	217			
KI	315	318	327			
FU	63	68	72			

Table 2. *Summary of data collected from colony monitoring plots*

	Skirza Head north plot			**Skirza Head ledge plot**		
Visit date	*07/06/2005*	*19/06/2005*	*25/06/2005*	*07/06/2005*	*19/06/2005*	*25/06/2005*
GU	167	147	149	210	199	198
RA	18	23	24	2	3	6
KI	65	64	63	4	5	5
FU	27	24	24	0	0	0
	Skirza Head south plot 1			**Skirza Head south plot 2**		
Visit date	*07/06/2005*	*19/06/2005*	*25/06/2005*	*07/06/2005*	*19/06/2005*	*25/06/2005*
GU	371	376	334	81	95	89
RA	25	30	29	11	9	13
KI	14	17	17	2	2	2
FU	0	0	0	2	1	2
SH	1	1	1	0	0	0

Table 3. *Summary of data collected from species monitoring plots*

	Badbea S1			**Badbea S2**		
Visit Date	*03/06/05*	*15/06/05*	*21/06/05*	*03/06/05*	*15/06/05*	*21/06/05*
SH	0	0	0	1	1	0
	Badbea S3			**Badbea S4**		
Visit Date	*03/06/05*	*15/06/05*	*21/06/05*	*03/06/05*	*15/06/05*	*21/06/05*
SH	0	0	0	0	0	0
	Badbea S5			**Badbea S6**		
Visit Date	*03/06/05*	*15/06/05*	*21/06/05*	*03/06/05*	*15/06/05*	*21/06/05*
SH	0	1	1	3	1	1
	Badbea S7			**Badbea S8**		
Visit Date	*03/06/05*	*15/06/05*	*21/06/05*	*03/06/05*	*15/06/05*	*21/06/05*
SH	1	1	1	5	2	1
	Inver Hill S1			**An Dun S1**		
Visit Date	*04/06/05*	*16/06/05*	*22/06/05*	*05/06/05*	*14/06/05*	*23/06/05*
SH	2	2	2	0	0	0
	An Dun S2			**An Dun S3**		
Visit Date	*05/06/05*	*14/06/05*	*23/06/05*	*05/06/05*	*14/06/05*	*23/06/05*
SH	4	4	4	3	3	4
	An Dun F1			**An Dun F2**		
Visit Date	*05/06/05*	*14/06/05*	*23/06/05*	*05/06/05*	*14/06/05*	*23/06/05*
FU	93	110	100	99	107	107
	An Dun F3			**An Dun F4**		
Visit Date	*05/06/05*	*14/06/05*	*23/06/05*	*05/06/05*	*14/06/05*	*23/06/05*
FU	28	30	30	61	80	76
	An Dun K1			**An Dun K2**		
Visit Date	*05/06/05*	*14/06/05*	*23/06/05*	*05/06/05*	*14/06/05*	*23/06/05*
KI	240	310	347	390	416	486
	An Dun K3			**An Dun K4**		
Visit Date	*05/06/05*	*14/06/05*	*23/06/05*	*05/06/05*	*14/06/05*	*23/06/05*
KI	183	212	212	186	222	221
	An Dun K5			**An Dun R1**		
Visit Date	*05/06/05*	*14/06/05*	*23/06/05*	*05/06/05*	*14/06/05*	*23/06/05*
KI	nc	72	72			
RA				370	369	402
	Ires Geo F3			**Ires Geo F4+F5**		
Visit Date	*06/06/05*	*19/06/05*	*24/06/05*	*06/06/05*	*19/06/05*	*25/06/05*
FU	52	54	52	205	198	205
	Ires Geo K1+K2			**Ires Geo K4**		
Visit Date	*06/06/05*	*19/06/05*	*24/06/05*	*06/06/05*	*19/06/05*	*24/06/05*
KI	231	276	290	115	124	125

Table 3. *Summary of data collected from species monitoring plots*

	Ires Geo Shag plot			**Ashy Geo F1**		
Visit Date	*06/06/05*	*19/06/05*	*25/06/05*	*06/06/05*	*19/06/05*	*24/06/05*
SH	2	0	0			
FU				86	81	74
	Broad Geo F1			**Broad Geo shag plot**		
Visit Date	*06/06/05*	*17/06/05*	*24/06/05*	*06/06/05*	*17/06/05*	*24/06/05*
SH				0	0	0
FU	63	67	63			

5. DISCUSSION AND COMPARISON WITH PREVIOUS COUNTS

5.1 General comments

Breeding seabird numbers can be affected by both short term and long term changes in various environmental factors. Long term changes may include changes in sea level temperatures and food availability. Short term changes are mostly due to the effects of weather.

2004 was a very poor year for breeding seabirds in many sites along the North Sea and in the Northern Isles (Mavor *et al*. 2005). Many species in these areas, particularly Kittiwake, have shown long term declines (Mavor *et al*. 2005).

In late winter 2004-2005, a prolonged spell of cool easterly winds led to a large wreck of European shags and to a lesser extent auks in the Moray Firth and along much of the North Sea coast (BTO data). A high percentage of the dead European shags were adults of breeding age. As a result of this wreck it appears that many European shags did not breed in 2005 and many of those that attempted were in poor condition. This led to a high level of breeding failures at monitored colonies (e.g. Swann, 2005).

It was also evident that the timing of the seabird breeding season was later than usual in many sites in Scotland in 2005 (*pers. obs.*). This was particularly evident amongst black-legged kittiwakes in Caithness. Birds were still observed to be gathering grass from cliff top fields in mid-June and at most plots the number of kittiwake nests increased with each subsequent count.

For these reasons it is recommended that for making comparative counts of breeding shag and kittiwake numbers between Caithness plots in 2005 and previous years, the maximum number of AONs should be used.

The number of auks and northern fulmars in the monitored plots showed much variation, with no obvious trends, between the three visits at each plot. It is recommended that the mean count be used for comparative purposes for these species.

5.2 Changes in numbers

5.2.1 Northern fulmar

Table 4 summarises and compares the mean number of northern fulmar AOS at the four main 'colonies'. It shows that numbers increased in all areas, bar Skirza Head, where only a few pairs nested. Overall there was a 61% increase in the mean number of AOS at all monitored plots in the East Caithness SPA between 1999 and 2005. In northeast Scotland and Shetland northern fulmars showed a marked decline between 1999 and 2004 (Mavor *et al*. 2005).

Table 4. *Comparison of the mean number of northern fulmar AOS in East Caithness colonies between 1999 and 2005.*

colony	mean no. 1999	mean no. 2005	% change
Berriedale/Inver Hill	20	30	+50%
An Dun	188	365	+94%
Ires Geo-Riera Geo	332	498	+50%
Skirza Head	30	27	-10%
Total all colonies	**570**	**920**	**+61%**

5.2.2 European shag

Table 5 summarises and compares the maximum number of European shag AONs at the four main 'colonies'. It shows that numbers decreased in all areas, bar Skirza Head. Overall there was a large 72% decrease in the mean number of AOS at all monitored plots in the East Caithness SPA between 1999 and 2005. This can almost certainly be attributed to the effects of the large wreck that occurred in late winter/ spring 2005 and affected a large number of adults of this species.

Table 5. *Comparison of the maximum number of European shag AONs in East Caithness colonies between 1999 and 2005.*

colony	mean no. 1999	mean no. 2005	% change
Berriedale/Inver Hill	73	14	-81%
An Dun	12	8	-33%
Ires Geo-Riera Geo	4	2	
Skirza Head	0	1	
Total all colonies	**89**	**25**	**-72%**

5.2.3 Black-legged kittiwake

Table 6 summarises and compares the maximum number of black-legged kittiwakes AONs at the four main 'colonies'. There were major increases at the two large colonies around An Dun and in the Ires Geo area. Numbers at the smaller colonies on the Berriedale cliffs and at Skirza Head decreased. Overall there was a 65% increase in the mean number of AOS at all monitored plots in the East Caithness SPA between 1999 and 2005. In northeast Scotland and Shetland black-legged kittiwakes showed a marked decline between 1999 and 2004 (Mavor *et al*. 2005).

Table 6. *Comparison of the maximum number of black-legged kittiwake AONs in East Caithness colonies between 1999 and 2005.*

colony	mean no. 1999	mean no. 2005	% change
Berriedale/Inver Hill	86	70	-19%
An Dun	1269	1963	+54%
Ires Geo-Riera Geo	679	1439	+112%
Skirza Head	120	89	-26%
Total all colonies	**2154**	**3561**	**+65%**

5.2.4 Common guillemot

Table 7 summarises and compares the mean number of common guillemots at the four main 'colonies'. It shows that numbers increased in the An Dun and Ires Geo areas, but declined at the Berriedale cliffs and Skirza Head. Overall there was a slight 3% increase in the mean number of birds at all monitored plots in the East Caithness SPA between 1999 and 2005.

Table 7. *Comparison of the mean number of common guillemots in East Caithness colonies between 1999 and 2005.*

colony	mean no. 1999	mean no. 2005	% change
Berriedale/Inver Hill	2729	2473	-9%
An Dun*****	848	933	+10%
Ires Geo-Riera Geo	4476	5072	+13%
Skirza Head	961	806	-16%
Total all colonies	**9014**	**9284**	**+3%**

***** The An Dun totals excludes the counts from plot 4. Callaghan *et al*. reported 570 – 582 birds in this plot, whereas only 158-197 were recorded in 2005. An examination of the 1999 photograph, suggests the figures of 570+ must be an error.

In north-east Scotland common guillemots showed little change in numbers between 1999 and 2004, whilst in Shetland there was a major decline (Mavor *et al*. 2005).

5.2.5 Razorbill

Table 8 summarises and compares the mean number of razorbills at the four main 'colonies'. It shows large increases in the mean number of birds at all monitored plots in the East Caithness SPA between 1999 and 2005, with an overall increase of 81%.

Table 8. *Comparison of the mean number of razorbills in East Caithness colonies between 1999 and 2005.*

colony	mean no. 1999	mean no. 2005	% change
Berriedale/Inver Hill	158	195	+23%
An Dun	305	587	+92%
Ires Geo-Riera Geo	403	796	+98%
Skirza Head	42	65	+55%
Total all colonies	**908**	**1643**	**+81%**

In northeast Scotland razorbills showed a slight increase between 1999 and 2004, whilst in Shetland there was a major decline (Mavor *et al*. 2005).

6. RECOMMENDATIONS FOR FUTURE WORK

The following recommendations are made.

1. In order to increase sample sizes in the Berriedale area it is recommended that some species plot counts be extended to become 'colony' counts. At the Berriedale shag plots 2, 3 and 4 northern fulmar, black-legged kittiwake and auks could be counted with minimal extra effort.
2. At An Dun the colony plot ADS1 is very difficult to count accurately, mainly because the bottom of the 'extra' plot is difficult to define. In future separate counts should be made for the four sections (1, 2, 3, and extra). This would then allow comparisons to be made on a section by section basis and if problems persist with the 'extra' block it can eventually be dropped.
3. At An Dun the colony plot 4 (ADS3) could be extended to the left and to the ledge below, thus creating an 'extra' colony count. This should be counted separately from the existing ADS3 count but could eventually replace the 'extra' section at ADS1.
4. Two of the monitored species: northern fulmar and black-legged kittiwake showed a marked increase in numbers, whereas the trend in other monitored areas of Scotland, particularly Shetland and northeast Scotland was of a significant decline over the same period. This suggests that seabirds in the East Caithness Cliffs SPA may be faring better than those elsewhere along the North Sea coast. It would be useful to monitor breeding output for a range of species on an annual basis to see how they are faring in Caithness for comparisons with other colonies. This could be done by establishing a small sub-set of plots which are counted and monitored on an annual basis. With careful choosing of plots the work could probably be done in a minimum of time of 3 days. A visit in late May to count the number of active nests/sites (all species), one in mid July to count number of large young (shag and black-legged kittiwake) and one in mid August to count large young (northern fulmar and European shag). This work could be done in conjunction with the JNCC Seabird Monitoring programme, who could be approached to assist the funding of such work.
5. It is recommended that for making comparative counts of breeding Europen shag and black-legged kittiwake numbers between Caithness plots in 2005 and previous years, the maximum number of AONs should be used.

7. REFERENCES

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APPENDIX 1. MONITORING PLOT RECORD CARDS

Appendix 1 gives details of weather and sea conditions during each count and the numbers of each species counted on each occasion.

Colony name: Badbea **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: Traighe Muile Cleite **Grid Ref (GPS):**ND08384 19234
Counted from: land **Method of obs:** Telescope + binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	03/06/2005	15/06/2005	21/06/2005
Time (BST) start	1205	0910	1000
Time (BST) finish	1315	1010	1115
Cloud cover[1]	4	6	6
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	1	1	1
Wind direction	S	S	S
GU (IND)	1179	1309	1097
RZ (IND)	97	150	122
KI (AON)	30	35	36
FU (AOS)	31	31	28
SH (AON)	0	1	1
GB (AOT)	1	1	1
LB (AOT	2	1	1
HG (AOT)	8	4	4

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: Badbea **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: S1 **Grid Ref (GPS):**ND08838 19893
Counted from: land **Method of obs:** Binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	03/06/2005	15/06/2005	21/06/2005
Time (BST) start	1005	0815	0850
Time (BST) finish	1015	0825	0900
Cloud cover[1]	4	8	8
Rain[2]	1	2	2
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	1	1	1
Wind direction	S	S	S
SH (AON)	0	0	0

Colony name: Badbea **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: S2a + S2b **Grid Ref (GPS):**ND08690 19539
Counted from: land **Method of obs:** Binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	03/06/2005	15/06/2005	21/06/2005
Time (BST) start	1040	0835	0910
Time (BST) finish	1055	0840	0915
Cloud cover[1]	4	8	8
Rain[2]	1	2	2
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	1	1	1
Wind direction	S	S	S
SH (AON)	1	1	0

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: Badbea **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: S3 **Grid Ref (GPS):**ND08560 19455
Counted from: land **Method of obs:** Binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	03/06/2005	15/06/2005	21/06/2005
Time (BST) start	1110	0850	0925
Time (BST) finish	1120	0855	0935
Cloud cover[1]	4	8	8
Rain[2]	1	2	2
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	1	1	1
Wind direction	S	S	S
SH (AON)	0	0	0

Colony name: Badbea **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: S4 **Grid Ref (GPS):**ND08384 19234
Counted from: land **Method of obs:** Telescope
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	03/06/2005	15/06/2005	21/06/2005
Time (BST) start	1145	1010	0950
Time (BST) finish	1200	1020	1000
Cloud cover[1]	4	8	8
Rain[2]	1	1	2
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	1	1	1
Wind direction	S	S	S
SH (AON)	0	0	0

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: Badbea **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: S5 **Grid Ref (GPS):**ND08384 19234
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	03/06/2005	15/06/2005	21/06/2005
Time (BST) start	1205	0910	1115
Time (BST) finish	1315	1010	1120
Cloud cover[1]	4	6	6
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	1	1	1
Wind direction	S	S	S
SH (AON)	0	1	1

Colony name: Badbea **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: S6 **Grid Ref (GPS):**ND08142 19037
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	03/06/2005	15/06/2005	21/06/2005
Time (BST) start	1335	1040	1140
Time (BST) finish	1345	1055	1150
Cloud cover[1]	4	6	2
Rain[2]	1	1	3
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	1	1	2
Wind direction	S	S	S
SH (AON)	3	1	1

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: Badbea **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: S7 **Grid Ref (GPS):**ND08051 18927
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	03/06/2005	15/06/2005	21/06/2005
Time (BST) start	1400	1110	1200
Time (BST) finish	1410	1120	1210
Cloud cover[1]	4	6	2
Rain[2]	1	1	3
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	1	1	2
Wind direction	S	S	S
SH (AON)	1	1	1

Colony name: Badbea **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: S8 **Grid Ref (GPS):**ND08051 18927
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	03/06/2005	15/06/2005	21/06/2005
Time (BST) start	1410	1120	1210
Time (BST) finish	1420	1140	1220
Cloud cover[1]	4	6	2
Rain[2]	1	1	3
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	1	1	2
Wind direction	S	S	S
SH (AON)	5	2	1

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: Inver Hill **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: plot1 **Grid Ref (GPS):**ND11372 21328
Counted from: land **Method of obs:** Telescope
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	04/06/2005	16/06/2005	22/06/2005
Time (BST) start	1310	1350	1040
Time (BST) finish	1355	1435	1120
Cloud cover[1]	4	6	5
Rain[2]	1	1	1
Sea state[3]	2	2	3
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	1	1	3
Wind direction	E	E	SW
GU (IND)	415	443	366
RZ (IND)	35	40	37
KI (AON)	0	0	0

Colony name: Inver Hill **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: plot2 **Grid Ref (GPS):**ND11357 21363
Counted from: land **Method of obs:** Binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	04/06/2005	16/06/2005	22/06/2005
Time (BST) start	1420	1300	1130
Time (BST) finish	1520	1340	1200
Cloud cover[1]	4	6	5
Rain[2]	1	1	1
Sea state[3]	2	2	3
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	1	1	3
Wind direction	E	E	SW
GU (IND)	364	420	383
RZ (IND)	34	34	24
KI (AON)	29	33	34

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: Inver Hill **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: plot3 **Grid Ref (GPS):**ND10945 21046
Counted from: land **Method of obs:** Telescope
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	04/06/2005	16/06/2005	22/06/2005
Time (BST) start	1120	1500	1240
Time (BST) finish	1220	1530	1300
Cloud cover[1]	4	5	5
Rain[2]	1	1	1
Sea state[3]	2	2	3
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	1	1	3
Wind direction	E	E	SW
GU (IND)	473	509	460
RZ (IND)	4	4	4

Colony name: Inver Hill **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: S1 **Grid Ref (GPS):**ND10759 20887
Counted from: land **Method of obs:** Binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	04/06/2005	16/06/2005	22/06/2005
Time (BST) start	1030	1545	1315
Time (BST) finish	1050	1600	1325
Cloud cover[1]	4	6	5
Rain[2]	1	1	1
Sea state[3]	2	2	3
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	1	1	3
Wind direction	E	E	SW
SH (AON)	2	2	2

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: An Dun **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: Plots1,2,3 + extra **Grid Ref (GPS):ND**14135 25895
Counted from: land **Method of obs:** Binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	05/06/2005	14/06/2005	23/06/2005
Time (BST) start	1005	1100	1000
Time (BST) finish	1125	1145	1030
Cloud cover[1]	5	8	7
Rain[2]	1	2	1
Sea state[3]	2	2	2
Swell[4]	1	1	2
Visibility at sea[5]	1	1	1
Wind speed[6]	2	2	3
Wind direction	NE	E	SW
GU (IND)	784	806	866
RZ (IND)	156	190	165
KI (AON)	475	517	587
FU (AOS)	37	45	39

Colony name: An Dun **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: plot 5 **Grid Ref (GPS):**ND14139 25920
Counted from: land **Method of obs:** Binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	05/06/2005	14/06/2005	23/06/2005
Time (BST) start	1215	1225	1450
Time (BST) finish	1230	1235	1500
Cloud cover[1]	5	8	7
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	1	1	2
Visibility at sea[5]	1	1	1
Wind speed[6]	2	2	3
Wind direction	NE	E	SW
GU (IND)	128	123	92
RZ (IND)	7	2	3
KI (AON)			
FU (AOS)	1	1	1

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: An Dun **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: plot 4 **Grid Ref (GPS):**ND14139 25920
Counted from: land **Method of obs:** Binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	05/06/2005	14/06/2005	23/06/2005
Time (BST) start	1230	1210	1450
Time (BST) finish	1250	1225	1500
Cloud cover[1]	5	8	7
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	1	1	2
Visibility at sea[5]	1	1	1
Wind speed[6]	2	2	3
Wind direction	NE	E	SW
GU (IND)	187	158	197
RZ (IND)	37	39	22
KI (AON)	32	34	38
FU (AOS)	15	17	22

Colony name: An Dun **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: F1 **Grid Ref (GPS):**ND14314 26225
Counted from: land **Method of obs:** telescope
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	05/06/2005	14/06/2005	23/06/2005
Time (BST) start	1310	1330	1400
Time (BST) finish	1325	1345	1415
Cloud cover[1]	5	6	6
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	1	1	2
Visibility at sea[5]	1	1	1
Wind speed[6]	2	2	3
Wind direction	NE	E	SW
FU (AOS)	93	110	100

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: An Dun **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: F2 **Grid Ref (GPS):**ND13953 25499
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	05/06/2005	14/06/2005	23/06/2005
Time (BST) start	1545	0940	1225
Time (BST) finish	1555	0955	1240
Cloud cover[1]	5	8	6
Rain[2]	1	2	1
Sea state[3]	2	2	2
Swell[4]	1	1	2
Visibility at sea[5]	1	1	1
Wind speed[6]	2	2	3
Wind direction	NE	E	SW
FU (AOS)	99	107	107

Colony name: An Dun **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: F3 **Grid Ref (GPS):**ND13953 25499
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	05/06/2005	14/06/2005	23/06/2005
Time (BST) start	1555	0955	1240
Time (BST) finish	1600	1005	1250
Cloud cover[1]	5	8	6
Rain[2]	1	2	1
Sea state[3]	2	2	2
Swell[4]	1	1	2
Visibility at sea[5]	1	1	1
Wind speed[6]	2	2	3
Wind direction	NE	E	SW
FU (AOS)	28	30	30

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: An Dun **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: F4 **Grid Ref (GPS):**ND13912 25590
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	05/06/2005	14/06/2005	23/06/2005
Time (BST) start	1520	0920	1125
Time (BST) finish	1525	0930	1140
Cloud cover[1]	5	8	7
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	1	1	2
Visibility at sea[5]	1	1	1
Wind speed[6]	2	2	3
Wind direction	NE	E	SW
FU (AOS)	61	80	76

Colony name: An Dun **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: K1 **Grid Ref (GPS):**ND13912 25590
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	05/06/2005	14/06/2005	23/06/2005
Time (BST) start	1505	0900	1100
Time (BST) finish	1520	0920	1125
Cloud cover[1]	5	8	7
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	1	1	2
Visibility at sea[5]	1	1	1
Wind speed[6]	2	2	3
Wind direction	NE	E	SW
KI (AON)	240	310	347

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: An Dun **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: K2 **Grid Ref (GPS):**ND13953 25499
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	05/06/2005	14/06/2005	23/06/2005
Time (BST) start	1525	105	1150
Time (BST) finish	1545	1025	1225
Cloud cover[1]	5	8	6
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	1	1	2
Visibility at sea[5]	1	1	1
Wind speed[6]	2	2	3
Wind direction	NE	E	SW
KI (AON)	390	416	486

Colony name: An Dun **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: K3 **Grid Ref (GPS):**ND14068 25681
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	05/06/2005	14/06/2005	23/06/2005
Time (BST) start	1420	1035	1310
Time (BST) finish	1440	1045	1340
Cloud cover[1]	5	8	6
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	1	1	2
Visibility at sea[5]	1	1	1
Wind speed[6]	2	2	3
Wind direction	NE	E	SW
KI (AON)	183	212	212

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: An Dun **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: K4 **Grid Ref (GPS):ND**14135 25895
Counted from: land **Method of obs:** Binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	05/06/2005	14/06/2005	23/06/2005
Time (BST) start	1125	1145	1000
Time (BST) finish	1200	1200	1030
Cloud cover[1]	5	8	7
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	1	1	2
Visibility at sea[5]	1	1	1
Wind speed[6]	2	1	3
Wind direction	NE	E	SW
KI (AON)	186	222	221

Colony name: An Dun **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: K5 **Grid Ref (GPS):**ND14147 25920
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	05/06/2005	14/06/2005	23/06/2005
Time (BST) start	1350	1245	1125
Time (BST) finish	1410	1300	1140
Cloud cover[1]	5	8	7
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	1	1	2
Visibility at sea[5]	1	1	1
Wind speed[6]	2	2	3
Wind direction	NE	E	SW
KI (AON)	nc	72	72

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: An Dun **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: R1 **Grid Ref (GPS):**ND13912 25590
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	05/06/2005	14/06/2005	23/06/2005
Time (BST) start	1450	0840	1040
Time (BST) finish	1505	0900	1100
Cloud cover[1]	5	8	7
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	1	1	2
Visibility at sea[5]	1	1	1
Wind speed[6]	2	2	3
Wind direction	NE	E	SW
RZ (IND)	370	369	402

Colony name: An Dun **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: S1 **Grid Ref (GPS):**ND13953 25499
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	05/06/2005	14/06/2005	23/06/2005
Time (BST) start	1600	0955	1250
Time (BST) finish	1605	1005	1255
Cloud cover[1]	5	8	6
Rain[2]	1	2	1
Sea state[3]	2	2	2
Swell[4]	1	1	2
Visibility at sea[5]	1	1	1
Wind speed[6]	2	2	3
Wind direction	NE	E	SW
SH (AON)	0	0	0

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: An Dun **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: S2 **Grid Ref (GPS):**ND14314 26225
Counted from: land **Method of obs:** telescope
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	05/06/2005	14/06/2005	23/06/2005
Time (BST) start	1325	1345	1415
Time (BST) finish	1335	1400	1425
Cloud cover[1]	5	6	6
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	1	1	2
Visibility at sea[5]	1	1	1
Wind speed[6]	2	2	3
Wind direction	NE	E	SW
SH (AON)	4	4	4

Colony name: An Dun **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: S3 **Grid Ref (GPS):**ND14316 26226
Counted from: land **Method of obs:** telescope
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	05/06/2005	14/06/2005	23/06/2005
Time (BST) start	1310	1400	1430
Time (BST) finish	1320	1410	1440
Cloud cover[1]	5	6	6
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	1	1	2
Visibility at sea[5]	1	1	1
Wind speed[6]	2	2	3
Wind direction	NE	E	SW
SH (AON)	3	3	4

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name:	Ires Geo	**County: Caithness**	
Observer:	Bob Swann	**Address:** 14 St.Vincent Road, Tain	
Study Plot Ref:	Repeat census site 2	**Grid Ref (GPS):**ND35769 45564	
Counted from:	land	**Method of obs:** Binoculars	
Type of colony:	cliff	**Photo taken:** yes	

Count No	**1**	**2**	**3**
Date	06/06/2005	19/06/2005	25/06/2005
Time (BST) start	1015	0930	1350
Time (BST) finish	1125	1040	1500
Cloud cover[1]	3	3	8
Rain[2]	1	1	4
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	2	2
Wind direction	N	S	NE
GU (IND)	1592	1706	1745
RZ (IND)	309	306	397
KI (AON)	301	306	290
FU (AOS)	14	18	21

Colony name:	Ires Geo	**County: Caithness**	
Observer:	Bob Swann	**Address:** 14 St.Vincent Road, Tain	
Study Plot Ref:	F3	**Grid Ref (GPS):**ND35861 45517	
Counted from:	land	**Method of obs:** Binoculars	
Type of colony:	cliff	**Photo taken:** yes	

Count No	**1**	**2**	**3**
Date	06/06/2005	19/06/2005	24/06/2005
Time (BST) start	1210	1110	1505
Time (BST) finish	1220	1125	1515
Cloud cover[1]	3	5	5
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	2	4
Wind direction	N	S	W
FU (AOS)	52	54	52

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: Ires Geo **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: F4+F5 **Grid Ref (GPS):**ND35769 45564
Counted from: land **Method of obs:** Binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	06/06/2005	19/06/2005	25/06/2005
Time (BST) start	1125	1045	1350
Time (BST) finish	1155	1100	1500
Cloud cover[1]	3	3	8
Rain[2]	1	1	4
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	2	2
Wind direction	N	S	NE
FU (AOS)	205	198	205

Colony name: Ires Geo **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: K1+K2 **Grid Ref (GPS):**ND35755 45122
Counted from: land **Method of obs:** Binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	06/06/2005	19/06/2005	24/06/2005
Time (BST) start	1305	1210	1350
Time (BST) finish	1325	1225	1430
Cloud cover[1]	3	7	5
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	2	4
Wind direction	N	S	W
KI (AON)	231	276	290

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: Ires Geo **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: K4 **Grid Ref (GPS):**ND35891 45479
Counted from: land **Method of obs:** Binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	06/06/2005	19/06/2005	24/06/2005
Time (BST) start	1230	1135	1440
Time (BST) finish	1250	1155	1500
Cloud cover[1]	3	5	5
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	2	4
Wind direction	N	S	W
KI (AON)	115	124	125

Colony name: Ires Geo **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: SHAG PLOT **Grid Ref (GPS):**ND35769 45564
Counted from: land **Method of obs:** Binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	06/06/2005	19/06/2005	25/06/2005
Time (BST) start	1125	1045	1445
Time (BST) finish	1155	1100	1500
Cloud cover[1]	3	3	8
Rain[2]	1	1	4
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	2	2
Wind direction	N	S	NE
SH (AON)	2	0	0

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: Ashy Geo **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: Ashy Geo arch plot **Grid Ref (GPS):**ND35802 44990
Counted from: land **Method of obs:** Binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	06/06/2005	19/06/2005	24/06/2005
Time (BST) start	0940	1250	1230
Time (BST) finish	1000	1320	1305
Cloud cover[1]	3	8	5
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	2	4
Wind direction	N	NW	W
GU (IND)	548	601	578
RZ (IND)	101	118	137
KI (AON)	95	102	102
FU (AOS)	7	6	7

Colony name: Ashy Geo **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: F1 **Grid Ref (GPS):**ND35673 44861
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	06/06/2005	19/06/2005	24/06/2005
Time (BST) start	0945	1240	1305
Time (BST) finish	1000	1250	1320
Cloud cover[1]	3	8	5
Rain[2]	1	1	1
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	2	4
Wind direction	N	NW	W
FU (AOS)	86	81	74

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: Tod'sGote **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: Tod'sGote **Grid Ref (GPS):**ND35670 44690
Counted from: land **Method of obs:** Binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	06/06/2005	17/06/2005	24/06/2005
Time (BST) start	0900	1320	1140
Time (BST) finish	0930	1400	1220
Cloud cover[1]	3	8	6
Rain[2]	1	2	1
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	3	4
Wind direction	N	S	W
GU (IND)	1174	1217	1139
RZ (IND)	80	87	104
KI (AON)	274	281	289
FU (AOS)	5	5	5

Colony name: Broad Geo **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: F1 **Grid Ref (GPS):**ND35327 44292
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	06/06/2005	17/06/2005	24/06/2005
Time (BST) start	1425	1220	1110
Time (BST) finish	1440	1250	1125
Cloud cover[1]	5	8	6
Rain[2]	1	2	1
Sea state[3]	2	2	2
Swell[4]	1	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	3	4
Wind direction	N	S	W
FU (AOS)	63	67	63

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: Broad Geo **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: shag plot **Grid Ref (GPS):**ND35327 44292
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	06/06/2005	17/06/2005	24/06/2005
Time (BST) start	1440	1220	1110
Time (BST) finish	1450	1250	1125
Cloud cover[1]	5	8	6
Rain[2]	1	2	1
Sea state[3]	2	2	2
Swell[4]	1	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	3	4
Wind direction	N	S	W
SH (AON)	0	0	0

Colony name: Riera Geo **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: Riera Geo **Grid Ref (GPS):**ND35324 43831
Counted from: land **Method of obs:** binoculars + telescope
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	06/06/2005	17/06/2005	24/06/2005
Time (BST) start	1510	1100	0950
Time (BST) finish	1600	1150	1050
Cloud cover[1]	4	8	6
Rain[2]	1	2	1
Sea state[3]	2	2	2
Swell[4]	1	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	3	4
Wind direction	N	S	W
GU (IND)	1759	1613	1541
RZ (IND)	291	241	217
KI (AON)	315	318	327
FU (AOS)	63	68	72

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
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[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: Skirza Head **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: North Plot **Grid Ref (GPS):** ND39464 68456
Counted from: land **Method of obs:** Binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	07/06/2005	19/06/2005	25/06/2005
Time (BST) start	1030	1440	1115
Time (BST) finish	1100	1500	1125
Cloud cover[1]	3	6	8
Rain[2]	1	1	2
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	3	2
Wind direction	NW	NW	NE
GU (IND)	167	147	149
RZ (IND)	18	23	24
KI (AON)	65	64	63
FU (AOS)	27	24	24

Colony name: Skirza Head **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: Ledge plot **Grid Ref (GPS):** ND39464 68456
Counted from: land **Method of obs:** Telescope
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	07/06/2005	19/06/2005	25/06/2005
Time (BST) start	1100	1400	1100
Time (BST) finish	1115	1440	1115
Cloud cover[1]	3	6	8
Rain[2]	1	1	2
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	3	2
Wind direction	NW	NW	NE
GU (IND)	210	199	198
RZ (IND)	2	3	6
KI (AON)	4	5	5

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: Skirza Head **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: south plot 1 **Grid Ref (GPS):** ND39421 68181
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	07/06/2005	19/06/2005	25/06/2005
Time (BST) start	1205	1530	1030
Time (BST) finish	1235	1600	1050
Cloud cover[1]	3	6	8
Rain[2]	1	1	2
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	3	2
Wind direction	NW	NW	NE
GU (IND)	371	376	334
RZ (IND)	25	30	29
KI (AON)	14	17	17
FU (AOS)	0	0	0
SH (AON)	1	1	1

Colony name: Skirza Head **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: south plot 2 **Grid Ref (GPS):** ND39421 68181
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	07/06/2005	19/06/2005	25/06/2005
Time (BST) start	1150	1510	1015
Time (BST) finish	1205	1530	1030
Cloud cover[1]	3	6	8
Rain[2]	1	1	2
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	3	2
Wind direction	NW	NW	NE
GU (IND)	81	95	89
RZ (IND)	11	9	13
KI (AON)	2	2	2
FU (AOS)	2	1	2

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
[4] 1= none, 2 = slight, 3= moderate, 4= heavy
[5] 1= good, 2= fair, 3= poor
[6] Beaufort scale

Colony name: Skirza Head **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: south plot 1 **Grid Ref (GPS):** ND39421 68181
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	07/06/2005	19/06/2005	25/06/2005
Time (BST) start	1205	1530	1030
Time (BST) finish	1235	1600	1050
Cloud cover[1]	3	6	8
Rain[2]	1	1	2
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	3	2
Wind direction	NW	NW	NE
GU (IND)	371	376	334
RZ (IND)	25	30	29
KI (AON)	14	17	17
FU (AOS)	0	0	0
SH (AON)	1	1	1

Colony name: Skirza Head **County: Caithness**
Observer: Bob Swann **Address:** 14 St.Vincent Road, Tain
Study Plot Ref: south plot 2 **Grid Ref (GPS):** ND39421 68181
Counted from: land **Method of obs:** binoculars
Type of colony: cliff **Photo taken:** yes

Count No	**1**	**2**	**3**
Date	07/06/2005	19/06/2005	25/06/2005
Time (BST) start	1150	1510	1015
Time (BST) finish	1205	1530	1030
Cloud cover[1]	3	6	8
Rain[2]	1	1	2
Sea state[3]	2	2	2
Swell[4]	2	2	2
Visibility at sea[5]	1	1	1
Wind speed[6]	3	3	2
Wind direction	NW	NW	NE
GU (IND)	81	95	89
RZ (IND)	11	9	13
KI (AON)	2	2	2
FU (AOS)	2	1	2

[1] oktas
[2] 1= none; 2= discontinuous light,3= discontinuous heavy, 4= continuous light, 5= continuous heavy
[3] 1= calm, 2= small waves, 3= large waves, 4= white wave crests, 5 = rough
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[6] Beaufort scale

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Policy and Advice Directorate, Great Glen House,
Leachkin Road, Inverness IV3 8NW
T: 01463 725000

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