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SEABIRD POPULATION MONITORING  
ON THE ISLE OF MAY  
IN 1994  
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Report to Scottish Natural Heritage

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## SUMMARY

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1. The fulmar population continued to increase at 5-6% per annum.
2. The shag populations was dramatically reduced following the winter's wreck of adults. The population is now at its lowest level for 35 years.
3. The counts of kittiwake nests were 50% lower than those made in 1993. This was largely due to many pairs failing to breed.
4. Despite the much publicized winter wreck, the guillemot population increased slightly but the change was not statistically significant.
5. Razorbills increased significantly and are now at their highest recorded levels.

# 1 BACKGROUND

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The Isle of May is treated as one of four strategic seabird monitoring sites in Great Britain, along with Fair Isle, Canna and Skomer. Effective monitoring of national trends of change in seabird populations is dependent upon the maintenance of longterm monitoring on the Isle of May. Such monitoring is also fundamental to the management of the NNR.

There is a long history of research on the seabirds of the Isle of May NNR. Changes in numbers and breeding parameters of a range of species are better documented than at almost any other colony in Europe. The increasing exploitation of the North Sea (e.g. the new fishery for sandeels in the approaches to the Firth of Forth, oil developments) and increasing numbers of human visitors to the Isle of May makes it imperative that such studies continue.

Over the 3 years 1991-93 Isle of May seabird studies by ITE were funded by SNH (gulls, numbers of cliff-nesting seabirds, eider and terns), JNCC (monitoring of various biological parameters), BP Exploration (most research on puffins), DoE (general) and NERC (science vote for all "pure" research). The DoE contribution ceased in March 1993 and the contract with BP terminated at the end of March 1994. JNCC extended their support for another three years and part-way through the 1994 field season SNH placed two one-year contracts with ITE to support the counting of (a) gulls and (b) cliff-nesting seabirds. This report covers the cliff-nesting seabirds.

## 2 OBJECTIVES

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To carry out counts of certain species of birds on the Isle of May NNR during the month of June 1994.

### WORKS/METHODOLOGY

1. Carry out 6-10 counts during June 1994 of individual guillemots and razorbills in previously established, randomly selected study plots.
2. Carry out one complete island count of guillemots, razorbills, kittiwakes, fulmars and shags during June 1994. Census units should be individuals for guillemot and razorbill and "nests" for kittiwake, fulmar and shag.
3. Produce a report detailing the counts and setting the counts in context using past counts.

### 3 METHODS

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1. Complete island counts were made of individual guillemots and razorbills in the breeding colonies. Birds on tidal rocks were not counted. Counts were made 1-3 June using traditional counting areas (Figure 1). Before or after each count, the numbers of auks present at the Cornerstone Study Plot were counted and, as the number of pairs of both species which laid in this area in 1994 was known from daily nest-checks, correction factors (k-values) were obtained and these were used to convert counts of individuals to breeding pairs.
2. Complete island counts of apparently occupied fulmar nest-sites, incubating kittiwakes (nests) and attended shag nests were made 1-3 June, 9 June and 10 June, respectively.
3. Between 0930-1200 BST on 10 dates between 1 and 20 June, individual guillemots were counted in 11 randomly positioned clearly delimited sections of the cliff. The counts were summed and the mean of all the daily counts was taken as an index of the guillemot population. Birds present in two other areas (Rona, Chatterstones) were also counted. The number of individual razorbills present in seven of these plots and two additional plots were counted and the mean daily total used as an index of razorbill numbers.
4. Counts are compared with those from previous seasons. Some of these were made under NCC/SNH contracts but many (e.g. all fulmar counts, most auk counts) remain copyright of ITE.

## 4 RESULTS

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### Fulmar *Fulmarus glacialis*

Between 1980 and 1993 the population increased at an average of 6% per annum. The increase between 1993 and 1994 was 5% with the population in 1994 being 279 sites (Figure 3, Tables 1 and 2).

### Shag *Phalacrocorax aristotelis*

The count of nests (403) was the lowest since 1959 (Figure 4, Tables 1 & 2) and concurrent studies show that this was due to a massive mortality suffered by adults during the east coast wreck in February 1994. The breeding population had been low (715 nests) in 1993 but this was due to many pairs not breeding and not to increased mortality. It will be many years before the population recovers as breeding output has been low for many years.

### Kittiwake *Rissa tridactyla*

The whole island count of 3751 nests was just over half that in 1993 (Table 2). This decline was also apparent in counts of nests in 8 monitoring plots (Table 3). However, much of this decline was due to many birds being present but failing to nest. A check of 16 areas during the count found that, on average, there were an additional 51% (SE 4.3%) of nests which had been started but where pairs had failed to breed. Many other pairs had not even reached this stage. Given the recent breeding failures concern must be expressed for the population and monitoring must continue.

### Guillemot *Uria aalge*

The total population count (19186 birds) was 7% up on that of 1993 (17919) but as colony attendance was low, the increase in the estimate of breeding pairs (13843) was much greater, at 11%. These counts are the highest since 1983 (Table 1).

The increase was also apparent in the monitoring counts (Table 4) but the overall difference between 1993 and 1994 was not statistically significant (Figure 6, Table 5).

### Razorbill *Alca torda*

Although the island count of individuals was virtually unchanged over that in 1993, the number of pairs thought to have bred increased by 9% (Table 2). The monitoring counts (Table 6), which covered about 26% of the total population, indicated a highly significant increase of 21% over those recorded in 1993 (Table 7). The 1993 monitoring count had been a highly significant increase over that in 1992 (Figure 7). The colonies are also expanding, for instance birds are now prospecting inland sites on the south side of the loch and breeding on the Inner Maidens and Ardcaran.



## 5 FIGURES

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**Figure 1.** The areas used for counting cliff-nesting seabirds on the Isle of May.

**Figure 2.** The location of monitoring plots for guillemots (G) and razorbills (R).

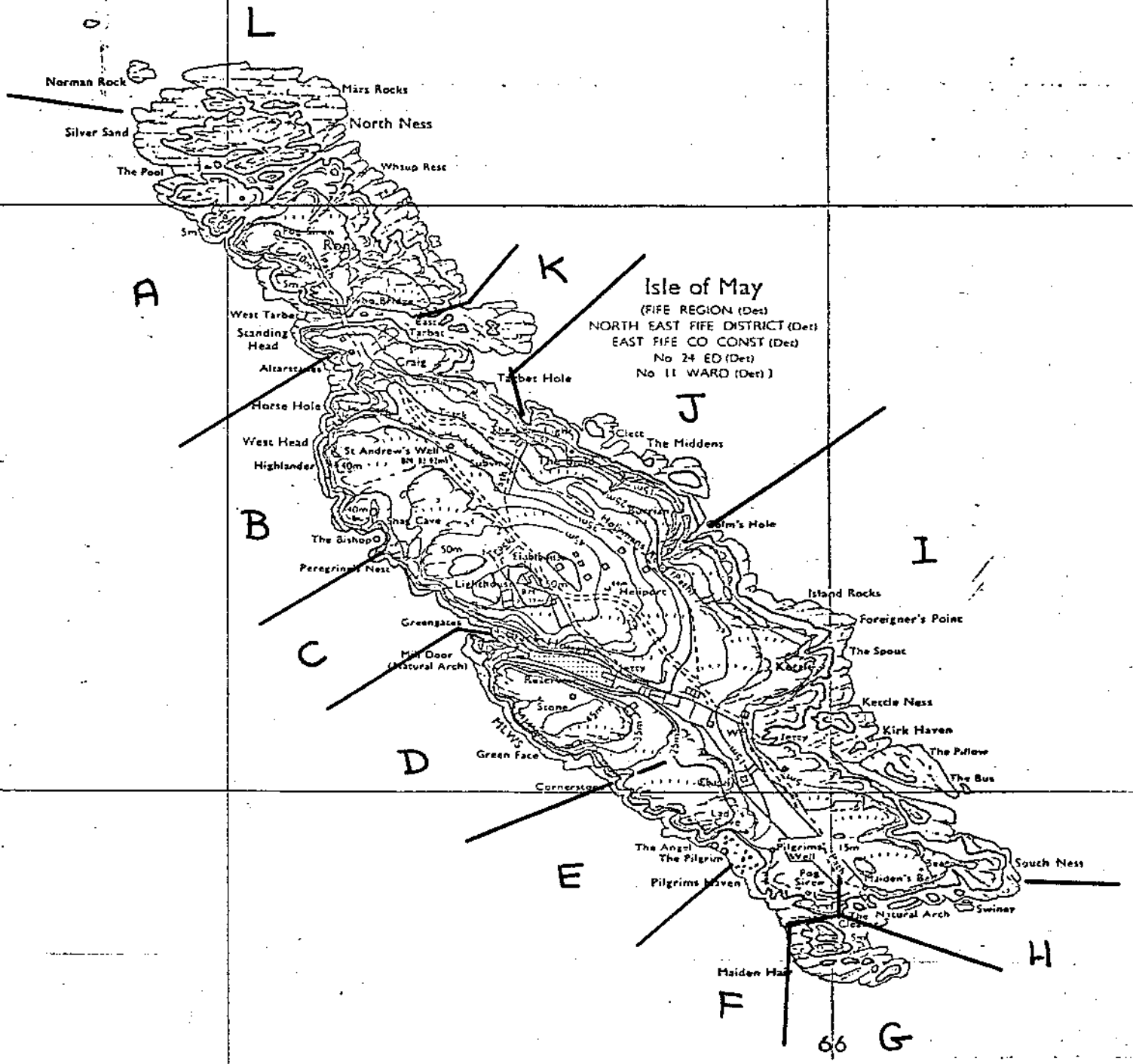
**Figure 3.** Changes in the numbers of apparently occupied nest sites of fulmars, 1980-1994.

**Figure 4.** Changes in the numbers of shag nests on the Isle of May 1980-1994.

**Figure 5.** Changes in the numbers of kittiwake nests on the Isle of May 1980-1994.

**Figure 6.** Changes in the numbers of individual guillemots in random-positioned monitoring plots, 1980-1994. Means and 95% confidence limits are shown. Means which are significantly different from each other (t-tests) are joined by solid-lines.

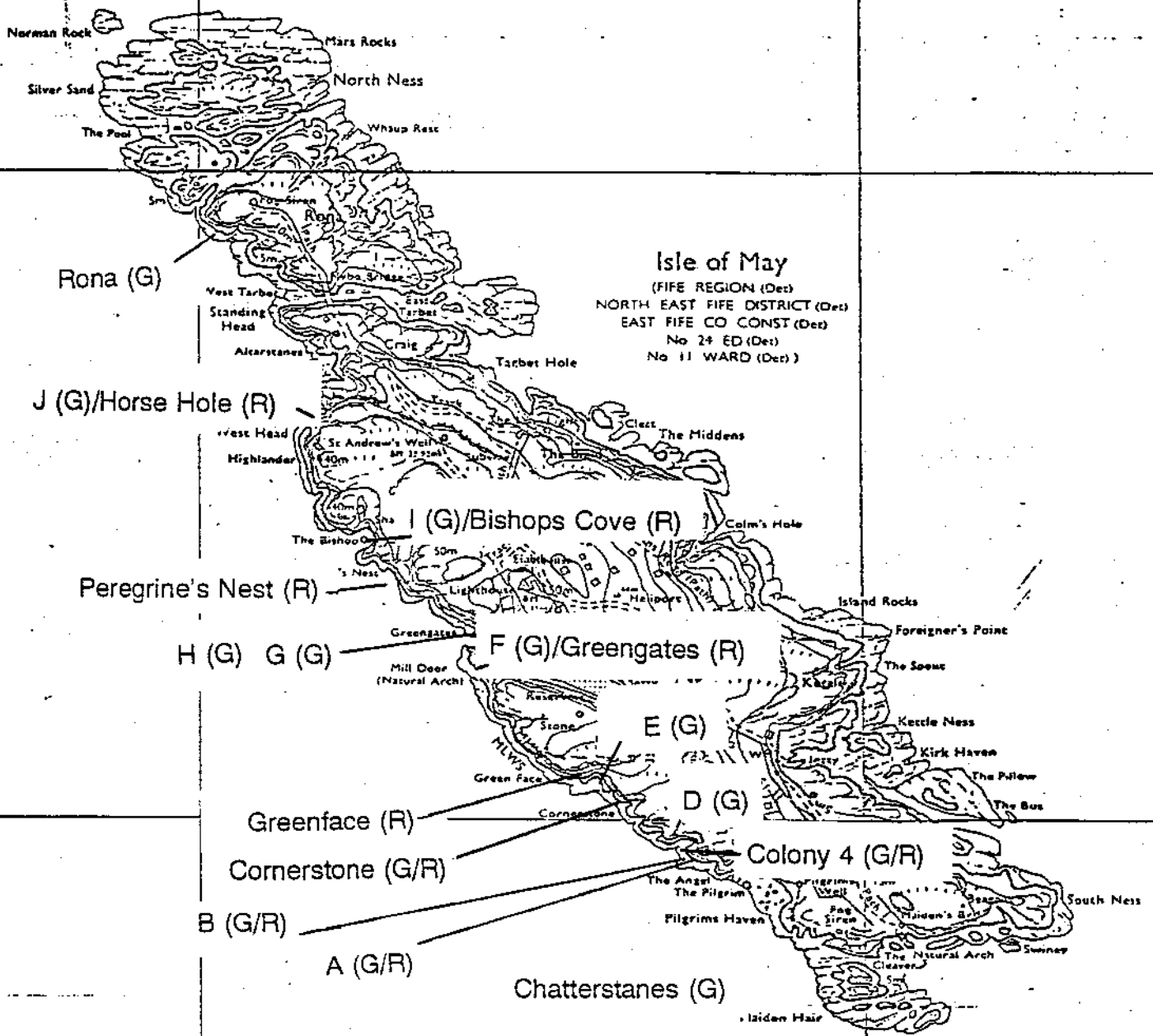
**Figure 7.** Changes in the numbers of individual razorbills in monitoring plots on the Isle of May, 1980-1994. Means and 95% confidence limits are shown. Means which are significantly different from each other (t-tests) are joined by solid-lines.



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Figure 1. The areas used for counting cliff-nesting seabirds on the Isle of May.

Figure 2. The location of monitoring plots for guillemots (G) and razorbills (R).



Isle of May  
(FIFE REGION (Det)  
NORTH EAST FIFE DISTRICT (Det)  
EAST FIFE CO CONST (Det)  
No 24 ED (Det)  
No 11 WARD (Det))

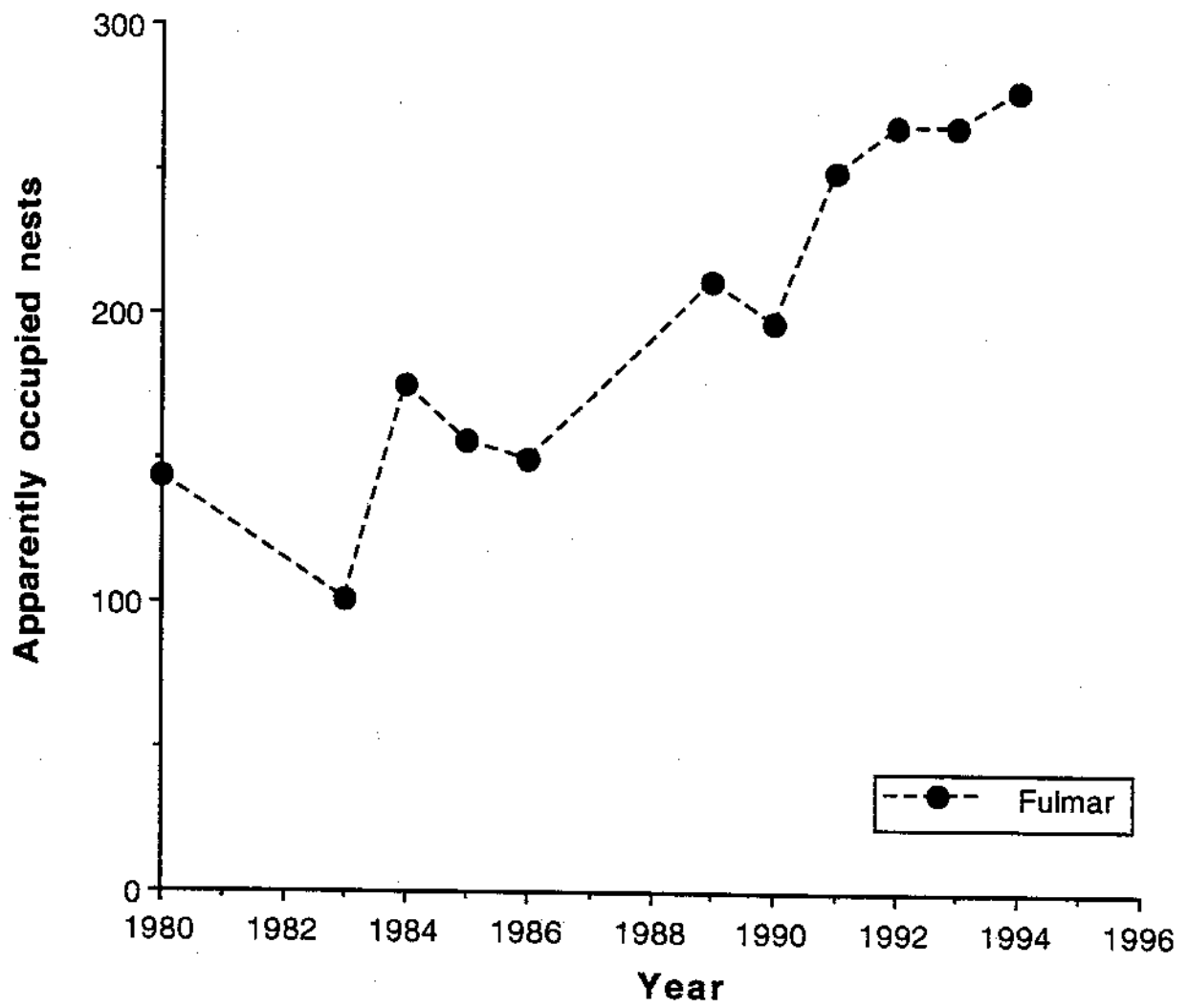
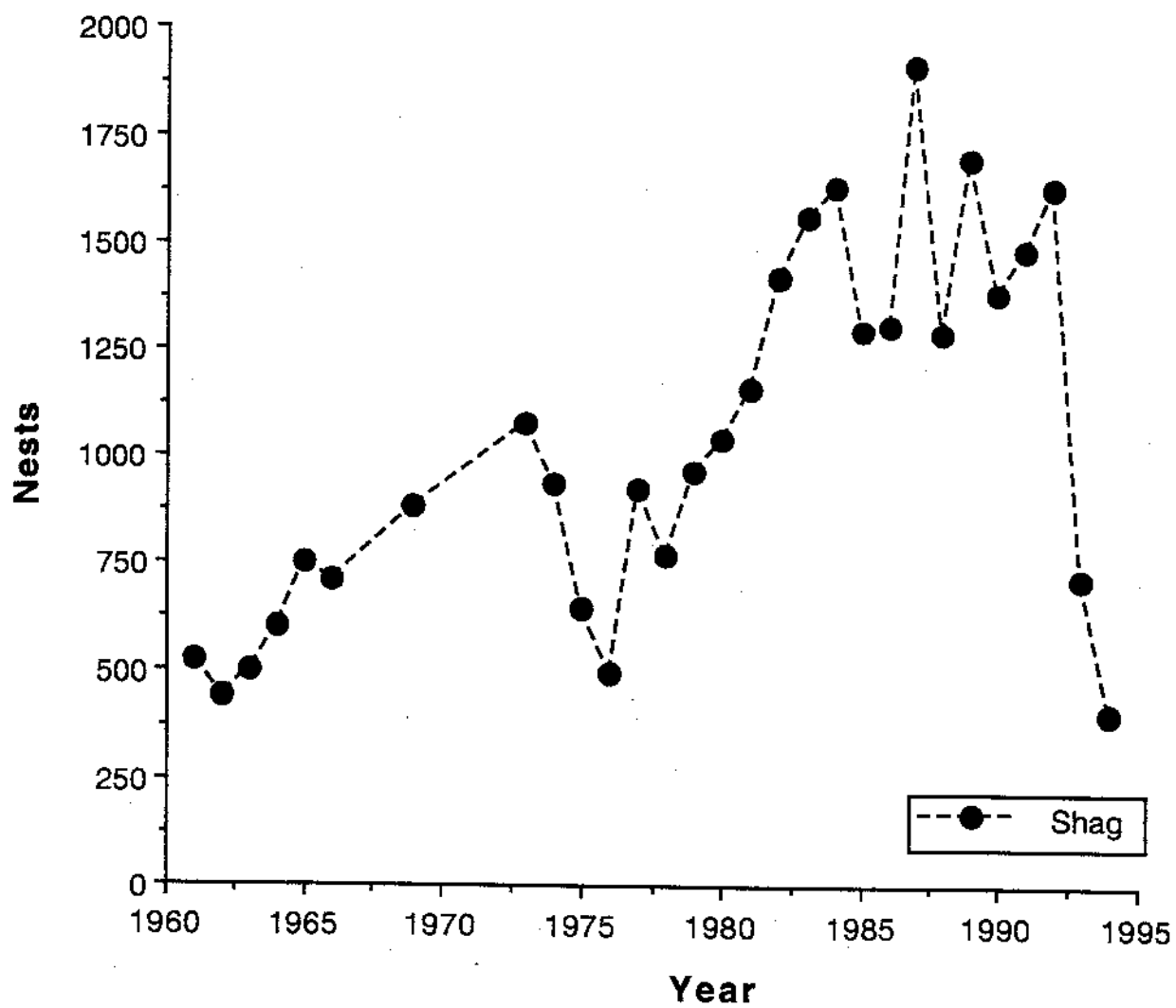


Figure 3. Changes in the numbers of apparently occupied nest sites of fulmars, 1980-1994.



**Figure 4.** Changes in the numbers of shag nests on the Isle of May 1980-1994.

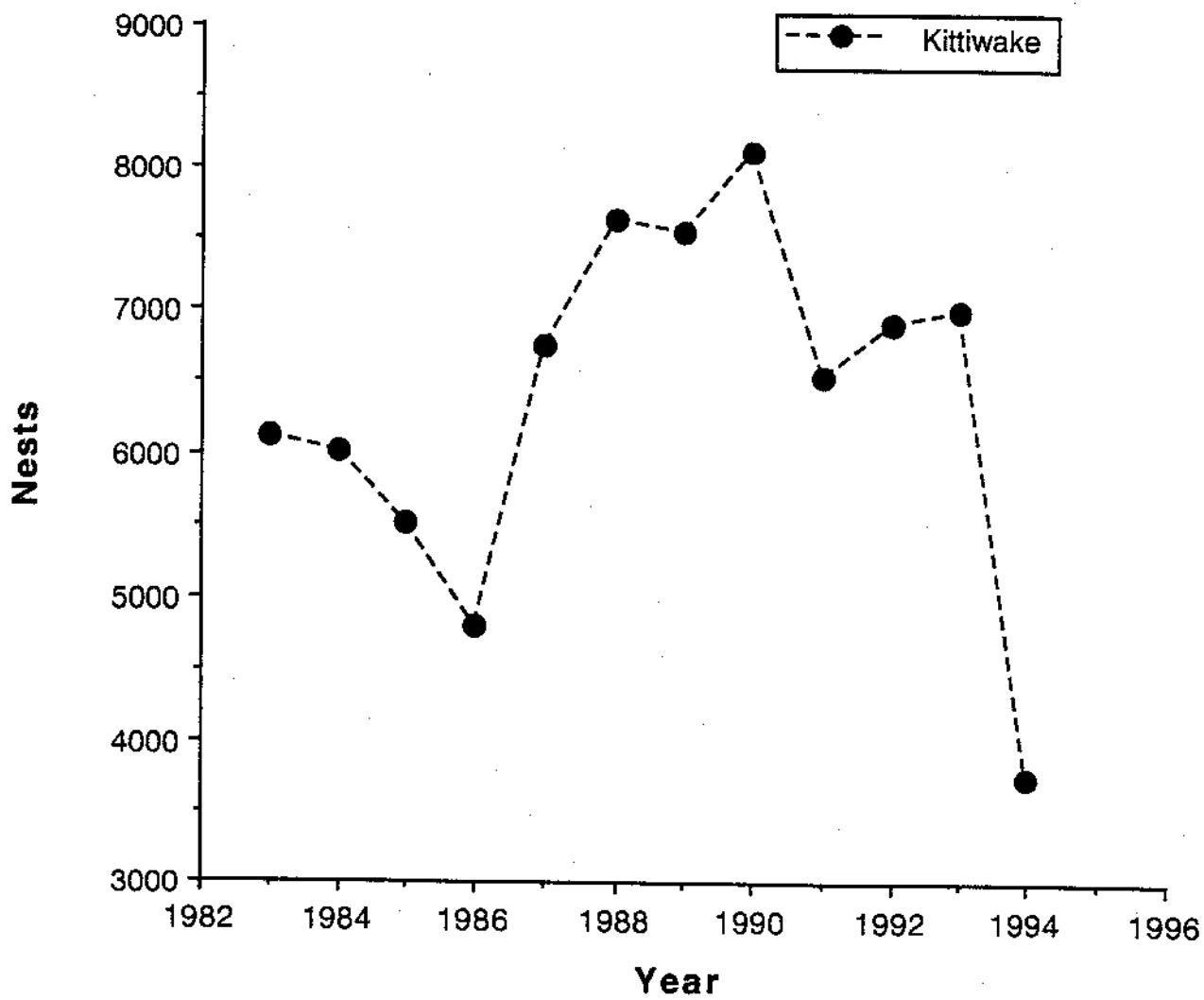


Figure 5. Changes in the numbers of kittiwake nests on the Isle of May 1980-1994.

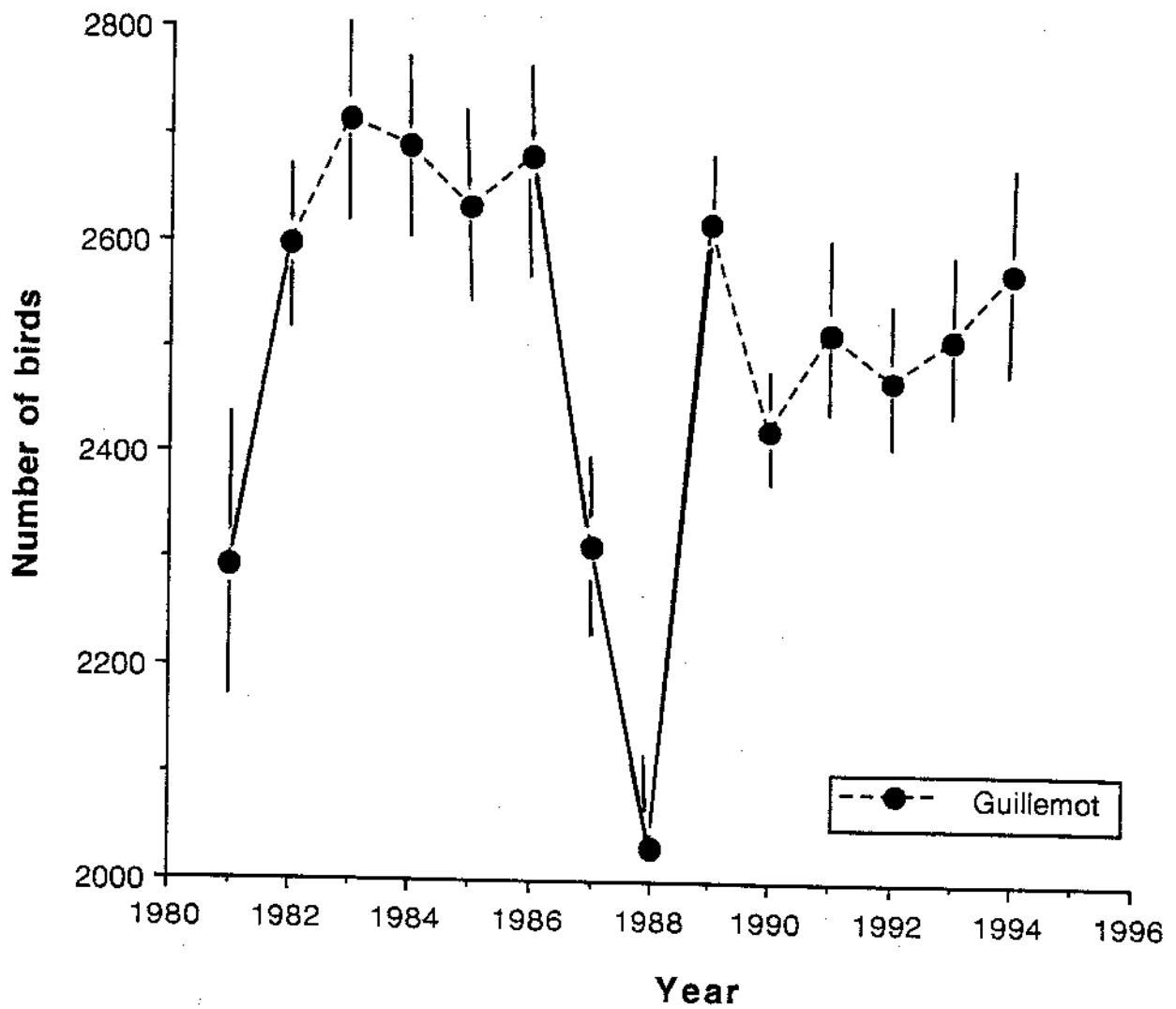
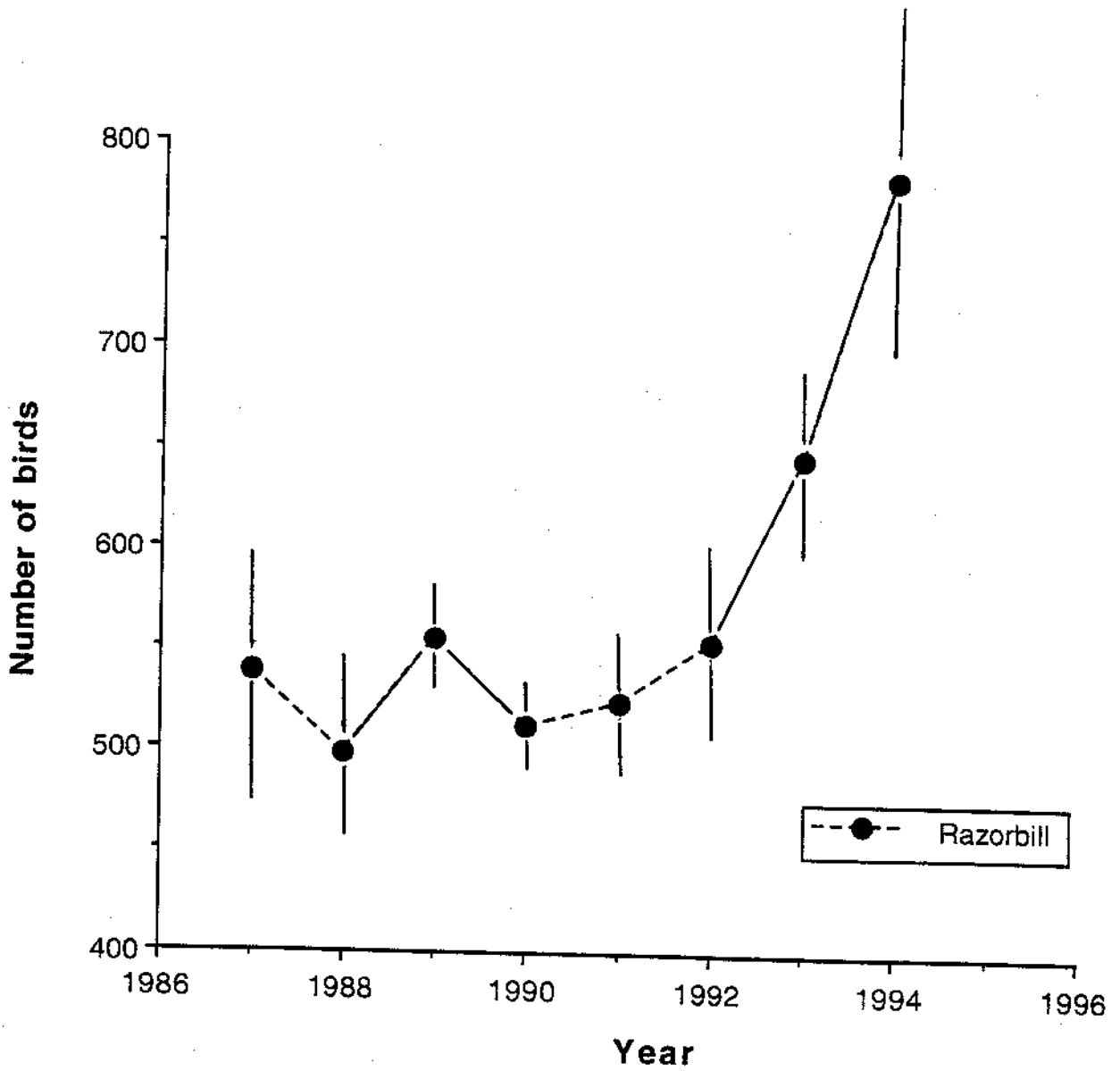


Figure 6. Changes in the numbers of individual guillemots in random-positioned monitoring plots, 1980-1994. Means and 95% confidence limits are shown. Means which are significantly different from each other (t-tests) are joined by solid-lines.



**Figure 7.** Changes in the numbers of individual razorbills in monitoring plots on the Isle of May, 1980-1994. Means and 95% confidence limits are shown. Means which are significantly different from each other (t-tests) are joined by solid-lines.



Table 1. Population estimates of Isle of May seabirds 1980-94

	Fulmar (sites)	Shag (nests)	Kittiwake (nests)	Guillemot (birds)	Razorbill (birds)
1980	143	1041	n.c.	n.c.	n.c.
1981	n.c.	1163	n.c.	16300	2086
1982	n.c.	1425	n.c.	n.c.	n.c.
1983	101	1567	(6115)	22550	2220
1984	175	1639	6012	19005	2051
1985	156	1524	5510	18390	1825
1986	150	1310	4801	19151	1864
1987	n.c.	1916	6765	17546	1887
1988	n.c.	1290	7638	16791	2128
1989	212	1703	7564	18328	2613
1990	198	1386	8129	16778	2368
1991	250	1487	6535	16834	1633
1992	266	1634	6916	17512	2581
1993	266	715	7009	17919	3022
1994	279	403	3751	19186	3034

Note: These figures should not be quoted without reference to M P Harris.

Table 2. Whole island counts of shags, kittiwakes, guillemots, razorbills and fulmars on the Isle of May in 1994.

	Fulmar (sites)	Shag (nests)	Kittiwake (nests)	Guillemot (birds)	Guillemot (pairs)	Razorbill (birds)	Razorbill (pairs)
A Rona (W)	9	59	192	421	303	86	62
B Altarstones - Peregrine's Nest	30	43	455	2096	1513	447	370
C Greengates	39	5	703	3573	2621	579	486
D South Plateau	47	13	909	7132	5181	755	499
E Cornerstone-Pilgrims' Haven	20	10	568	4413	3099	822	541
F Pilgrims' Haven - Lady's Cave	18	30	317	617	444	140	105
G The Maidens - Inner	0	7	2	0	0	1	1
The Maidens - Outer	2	24	45	200	150	13	10
H South Ness and Lady's Bed	15	18	116	230	166	67	49
I South Ness - Colm's Hole	11	93	22	0	0	2	1
J Colm's Hole - Low Light	20	66	201	125	88	32	24
K Tarbet - Low Light	24	33	139	379	278	90	79
L Rona (N and E)	1	2	2	0	0	0	0
Lochside (S)	43	0	37	0	0	0	0
Lochside (N)	0	0	43	0	0	0	0
<b>1994 Total</b>	<b>279</b>	<b>403</b>	<b>3751</b>	<b>19186</b>	<b>13843</b>	<b>3034</b>	<b>2227</b>
<b>1993 Total</b>	<b>266</b>	<b>715</b>	<b>7009</b>	<b>17919</b>	<b>12418</b>	<b>3022</b>	<b>2045</b>
<b>% Change</b>	<b>+5</b>	<b>-44</b>	<b>-46</b>	<b>+7</b>	<b>+11</b>	<b>0</b>	<b>+9</b>

Notes:

- (1) Auks and fulmars were counted on 1-3 June, shag on 10 June, kittiwake on 9 June.
- (2) Counts of individual auks were converted to pairs using correction factors at the Cornerstone study colony where 131 and 45 pairs of guillemots and razorbills bred.
- (3) Counts were made by S Wanless and M P Harris.
- (4) Figures should not be used without consultation with M P Harris.

Table 3. Counts of occupied kittiwake nests in the non-random plots on 9-10 June 1994.

Plot	Nests 1994	% Change 1993-94
1	13	-63
2L	33	-31
2R	31	-42
3	21	-55
4	85	-45
7+7b	83	-28
8,9,9 extra	38	-41
10	91	-56
<b>Total</b>	<b>395</b>	<b>-46</b>

Counts were made by S. Wanless

Table 4. Counts of guillemots in monitoring plots on the Isle of May, 1 to 19 June 1994.

Date	Chatter- stones	A	B	D	E	F	G	H	I	J	Rona	Corner- stone	Colony 4		Total (using Colony 4 New)
													Old area	New area	
1 June	419	225	233	333	141	506	181	353	141	75	135	178	241	309	3229
2 June	466	249	254	294	168	443	162	324	145	90	134	182	250	313	3224
5 June	524	197	234	325	130	451	185	335	138	66	165	187	234	315	3252
6 June	602	247	200	318	144	486	187	374	156	73	181	195	259	340	3583
8 June	647	216	263	290	136	488	186	340	140	76	175	191	240	317	3465
11 June	614	233	278	301	145	499	206	371	151	71	180	203	249	344	3602
13 June	568	240	261	332	150	480	189	356	133	73	174	204	255	354	3514
16 June	406	213	186	254	148	447	160	281	117	72	155	170	223	287	2896
18 June	574	232	244	296	124	475	190	345	145	63	158	195	227	324	3365
19 June	631	222	259	314	158	436	198	423	141	72	199	200	231	315	3626
<b>Mean</b>	<b>551</b>	<b>227</b>	<b>249</b>	<b>306</b>	<b>144</b>	<b>471</b>	<b>183</b>	<b>350</b>	<b>141</b>	<b>73</b>	<b>166</b>	<b>192</b>	<b>241</b>	<b>321</b>	<b>3376</b>
<b>S.D.</b>	<b>96</b>	<b>16</b>	<b>27</b>	<b>24</b>	<b>13</b>	<b>25</b>	<b>13</b>	<b>37</b>	<b>13</b>	<b>7</b>	<b>21</b>	<b>13</b>	<b>12</b>	<b>20</b>	<b>229</b>

Note: The monitoring total used in Figure 6 excludes Chatterstones and Rona and uses Colony 4 (Old area).

Table 5. Summary of changes in the numbers of individual guillemots in counting plots on the Isle of May, 1993-94.

Plot	1994 Mean	SE	% Change from 1993	Significance
Chatterstanes	551	30.3	+19	P<0.05
A	227	5.1	+7	P<0.05
B	249	8.7	+16	P<0.01
D	306	7.6	+4	n.s.
E	144	4.1	-7	n.s.
F	471	7.9	+7	P<0.02
G	183	4.3	+6	n.s.
H	350	11.6	-2	n.s.
I	141	3.3	-14	P<0.05
J	73	2.3	-8	P<0.05
Rona	166	6.5	+3	n.s.
Cornerstone	192	4.1	+7	n.s.
Colony 4 (new)	321	6.2	+3	n.s.
<b>Total</b>	<b>3376</b>	<b>72.6</b>	<b>+5</b>	<b>n.s.</b>

Note: Chatterstanes and Rona are excluded, and Colony 4 (new) is replaced by Colony 4 (old), for the calculation of the annual index plotted in Figure 6.

Table 6. Counts of razorbills in 9 plots on the Isle of May, 1 to 19 June 1994.

	Greenface	Peregrine's Nest	A	B	Greengates	Bishop's Cove	Horse Hole	Cornerstone	Colony 4 Old area	New area	Total
June 1	147	60	52	46	198	113	4	73	22	54	747
June 2	150	62	59	52	215	101	4	82	35	76	801
June 5	105	70	67	51	172	97	3	70	28	63	698
June 7	174	64	57	48	235	105	3	100	28	72	858
June 9	166	73	60	64	187	114	5	75	26	72	816
June 11	118	92	70	65	229	124	5	92	32	89	884
June 13	111	84	65	59	196	118	7	66	26	81	787
June 16	107	76	39	38	163	94	3	66	25	62	648
June 18	148	64	66	46	203	89	4	91	32	86	797
June 19	170	71	52	44	203	115	4	77	20	72	810
<b>Mean</b>	<b>140</b>	<b>72</b>	<b>59</b>	<b>51</b>	<b>200</b>	<b>107</b>	<b>4</b>	<b>79</b>	<b>27</b>	<b>72</b>	<b>784</b>
<b>SD</b>	<b>27</b>	<b>10</b>	<b>9</b>	<b>9</b>	<b>23</b>	<b>12</b>	<b>1</b>	<b>12</b>	<b>5</b>	<b>11</b>	<b>71</b>

Notes: Total uses Colony 4 (new)

**Table 7.** Summary of changes in the number of individual razorbill in 9 plots on the Isle of May, 1993-4.

	1994 mean	SE	% change from 1993	Significance
Greenface	140	8.6	+27	P<0.05
Peregrine's Nest	72	3.2	0	n.s.
A	59	2.9	+30	P<0.01
B	51	2.8	+31	P<0.01
Greengates	200	7.2	+17	P<0.02
Bishop Cove (I)	107	3.6	+34	P<0.001
Horse Hole (J)	4	0.4	(+14)	-
Cornerstone	79	3.7	+23	P<0.02
C4 (New)	72	3.5	+18	P<0.05
<b>Total</b>	<b>784</b>	<b>22.3</b>	<b>+21</b>	<b>P&lt;0.0005</b>

Note: Means were tested using t-tests

Table 8. Weather conditions during seabird monitoring counts in 1994.

Date	WIND		Sea state	Cloud cover	Visibility
	Direction	Beaufort force			
June					
1	W	2	Calm	8/8	Moderate
2	Calm	Calm	Calm	8/8	Moderate
5	W	6	Rough	2/8	Good
6	W	6-4	Rough	8/8	Moderate
8	W	5	Rough	3/8	Excellent
11	W	4	Moderate	7/8	Good
13	W	4	Slight	2/8	Excellent
16	SE	1	Calm	8/8	Moderate
18	NW	5-6	Rough	8/8	Moderate
19	W	5	Moderate	3/8	Good