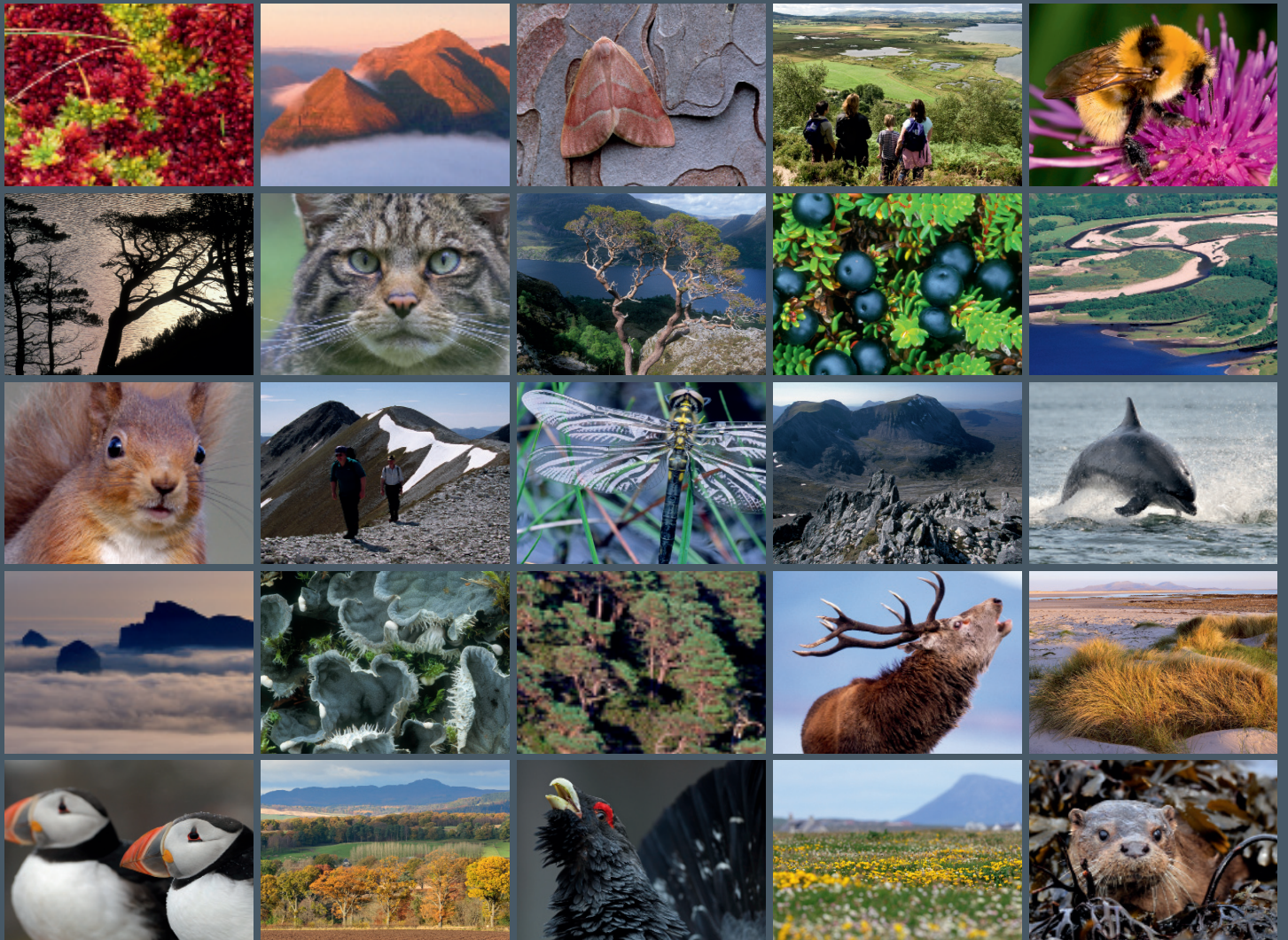


Waders and wildfowl on the Ythan Estuary 1996/1997





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Erratum

Please note that data for Bar-tailed godwit for 28 November 1996 on page 18 appears twice.

**WADERS AND WILDFOWL ON THE
YTHAN ESTUARY 1996/97
A REPORT TO SNH**

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INTRODUCTION

The wader and wildfowl counts in this report are a direct continuation of the series started in 1989/90, with the same objective of monitoring the bird populations of the Ythan estuary by means of twice-monthly surveys of numbers and distribution. The counts were carried out from 18 July to 24 June 1997, using the same methods as in previous years (Patterson and Laing 1992, 1993, 1994, 1995, 1996; Appendix 1). Since the field surveys in 1996/97 were carried out by a specialist ornithologist, it was possible for the first time to include counts of species which occur less commonly on the Ythan.

RESULTS

a) Individual species

As in previous reports, the data are presented in separate species accounts, arranged in taxonomic order. Herons and Mute Swans have been included for the first time. For each species, a table shows the number of birds found in each section of the estuary from the mouth upstream (ie, Mouth, Inches, Quay, Tarty, Sleek, Haddo, Snub, Machar, and Logie), as defined in Patterson and Laing (1992; Figure 1), and

the total on the whole estuary on each count date. The data are summarised and peak numbers are compared with those in the previous year. Only the commoner species, which were included in previous reports, are dealt with in this section; the species recorded less commonly during the year are tabulated in section d).

HERON *Ardea cinerea*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
18 7 96	0	0	1	0	0	0	1	0	0	2
29 7 96	3	1	3	3	0	0	1	0	0	11
16 8 96	0	2	5	3	0	2	1	2	0	15
26 8 96	0	2	0	8	7	4	12	0	1	34
11 9 96	0	0	0	0	25	4	2	3	3	37
29 9 96	1	3	0	0	3	0	2	1	3	13
8 10 96	0	0	0	0	5	3	5	1	2	16
30 10 96	1	2	0	0	1	2	0	0	1	7
5 11 96	0	2	1	0	1	1	2	1	1	9
28 11 96	0	1	1	0	1	1	0	0	0	4
15 12 96	1	2	0	0	1	1	0	0	2	7
31 12 96	0	3	0	0	1	0	0	0	1	5
14 1 97	0	1	1	0	1	0	0	0	1	4
28 1 97	0	0	0	0	1	0	0	0	1	2
15 2 97	0	2	1	1	1	0	0	0	1	6
28 2 97	0	0	0	0	1	0	0	0	0	1
10 3 97	0	0	0	0	3	2	0	1	2	8
18 3 97	0	0	0	0	1	0	0	0	1	2
12 4 97	1	1	0	0	0	0	0	0	0	2
30 4 97	0	1	2	0	1	0	0	2	0	6
3 5 97	0	2	3	0	4	0	0	0	0	9
23 5 97	1	5	0	1	2	1	0	1	2	13
6 6 97	1	3	0	0	2	2	0	1	0	9
24 6 97	0	7	2	0	2	2	2	1	1	17

Heron was seen throughout the year in all parts of the estuary, with highest numbers in the mid-estuary in autumn. The species was not counted in previous years, so no comparisons are possible.

MUTE SWAN *Cygnus olor*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
18 7 96	0	0	0	0	0	0	1	15	0	16
29 7 96	0	0	0	0	0	0	4	3	0	7
16 8 96	0	0	2	0	0	0	5	6	0	13
26 8 96	0	0	0	0	7	0	0	0	0	7
11 9 96	0	0	0	0	7	1	9	0	0	17
29 9 96	0	0	0	0	7	2	5	0	0	14
8 10 96	0	0	0	0	1	7	8	1	0	17
30 10 96	0	0	2	0	0	4	0	3	3	12
5 11 96	0	2	0	0	0	4	8	0	0	14
28 11 96	0	0	0	0	4	9	2	0	0	15
15 12 96	0	5	0	0	4	24	0	24	0	57
31 12 96	0	1	0	0	15	0	0	36	2	54
14 1 97	0	0	0	0	6	0	1	38	0	45
28 1 97	0	1	0	0	0	0	0	29	15	45
15 2 97	0	0	0	0	0	17	5	20	0	42
28 2 97	0	0	0	0	0	43	0	0	0	43
10 3 97	0	0	0	0	0	1	0	0	1	2
18 3 97	0	0	0	0	2	7	0	0	3	12
12 4 97	0	0	0	0	0	36	0	4	0	40
30 4 97	0	1	0	0	0	57	0	0	0	58
3 5 97	0	2	0	0	4	1	0	0	0	7
23 5 97	0	2	2	0	10	2	19	2	0	37
6 6 97	2	0	0	0	15	17	4	0	0	38
24 6 97	0	0	0	0	23	8	5	0	0	36

Mute Swans were also found throughout the year, mainly in the upper half of the estuary. Again, this species was not counted in earlier years, so no comparisons can be made.

SHELDUCK *Tadorna tadorna*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
18 7 96	0	0	0	0	0	0	0	3	0	3
29 7 96	0	0	0	0	4	0	2	0	7	13
16 8 96	0	0	0	3	10	6	0	3	2	24
26 8 96	0	0	0	0	0	0	0	1	0	1
29 9 96	0	0	0	0	3	0	0	0	0	3
8 10 96	0	0	0	0	0	1	0	0	1	2
30 10 96	0	0	0	0	2	0	0	0	0	2
5 11 96	0	0	0	0	3	0	0	0	0	3
28 11 96	0	0	0	0	9	0	0	0	0	9
15 12 96	0	0	0	0	12	0	0	0	0	12
31 12 96	0	3	0	0	19	0	0	0	0	22
14 1 97	0	0	7	0	10	0	0	1	0	18
28 1 97	0	2	3	0	38	0	0	15	6	64
15 2 97	0	5	2	9	49	5	2	7	0	79
28 2 97	0	5	4	6	31	8	10	5	12	81
10 3 97	0	3	2	4	25	20	29	0	4	87
18 3 97	0	3	3	7	48	6	0	0	5	72
12 4 97	0	0	1	6	12	6	0	5	0	30
30 4 97	0	1	5	2	44	8	1	8	8	77
3 5 97	2	0	7	4	70	4	0	13	9	109
23 5 97	0	3	5	6	13	12	8	4	2	53
6 6 97	2	4	6	4	24	3	10	10	2	65
24 6 97	0	0	2	24	20	27	31	15	0	119

Shelducks were seen in all months, although numbers were very low between August and January. The peak count of 119 on 24 June 1997 was somewhat higher than the peaks of 84 and 98 in the two preceding years. Most Shelducks were seen in the middle stretches of the estuary. As in previous years, the counts do not include the whole breeding population, since birds on freshwater pools, in the Forvie dunes and on the Ythan above Logie Buchan bridge were not counted.

EIDER *Somateria mollissima*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
3 6 96	880	633	227	10	9	0	0	0	0	1759
14 6 96	1189	267	87	5	11	0	0	0	0	1559
18 6 96	1133	291	98	13	9	0	0	0	0	1544
27 6 96	1249	190	64	8	7	3	0	0	0	1521
18 8 96	2048	3	37	0	5	0	0	0	0	2093
27 8 96	1576	0	15	0	0	0	0	0	0	1591
9 9 96	840	1	33	0	12	0	0	0	0	886
30 9 96	989	4	1	0	3	0	0	0	0	997
8 10 96	934	1	74	0	4	0	0	0	0	1013
23 10 96	323	249	28	0	54	0	0	0	0	654
5 11 96	41	416	35	0	3	0	0	0	0	495
22 11 96	8	25	412	0	22	0	0	0	0	467
8 12 96	6	509	143	0	1	0	0	0	0	659
24 12 96	2	2	760	0	17	0	0	0	0	781
6 1 97	10	4	596	0	51	0	0	0	0	661
19 1 97	18	1	511	0	41	0	0	0	0	571
7 2 97	0	240	236	0	79	0	0	0	0	555
21 2 97	3	408	93	0	52	0	0	0	0	556
6 3 97	40	37	225	0	49	0	0	0	0	351
25 3 97	204	4	279	0	40	4	0	0	0	531
9 4 97	613	0	130	0	33	0	0	0	0	776
27 4 97	2013	260	414	0	55	8	0	0	0	2750
3 5 97	1382	1573	377	19	78	11	0	0	0	3440
6 5 97	2141	785	612	0	34	6	0	0	0	3578
18 5 97	2005	1099	498	0	100	7	0	0	0	3709
22 5 97	1877	731	331	0	47	5	0	0	0	2991
28 5 97	1734	655	280	0	39	10	0	0	0	2718
5 6 97	1905	451	248	31	16	2	0	0	0	2653
9 6 97	1585	387	199	0	15	2	0	0	0	2188
21 6 97	2406	48	187	0	41	1	0	0	0	2683
24 6 97	1846	215	164	0	3	3	0	0	0	2231

Eiders were found on the estuary throughout the year, mainly between the Mouth and Waterside Bridge. The peak count of 3,709 on 18 May 1997 was considerably higher than the peak of 1,906 in 1996. Numbers remained around 500 - 700 over the winter, with a low of 351 on 6 March. Only 31 ducklings were fledged in 1997 (including those on the sea coast), the same number as in 1996.

WIGEON *Anas penelope*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
11 9 96	0	0	0	0	17	25	0	4	0	46
29 9 96	0	0	50	0	143	10	0	0	0	203
8 10 96	15	44	80	0	0	0	0	0	0	139
30 10 96	40	19	228	0	77	0	0	0	0	364
5 11 96	17	125	19	0	164	40	0	0	0	365
28 11 96	88	54	158	0	82	0	0	0	0	382
31 12 96	202	73	240	0	48	0	0	0	0	563
14 1 97	80	58	40	0	496	0	0	0	0	674
28 1 97	78	60	55	0	290	13	0	0	0	496
15 2 97	14	157	40	0	175	40	0	0	0	426
28 2 97	50	52	69	0	364	0	0	0	0	535
10 3 97	25	13	5	0	0	0	34	48	0	125
18 3 97	2	10	27	0	4	0	0	6	0	49
12 4 97	0	0	0	0	4	0	2	0	0	6
30 4 97	0	0	0	0	0	0	2	0	0	2
3 5 97	0	4	0	0	0	0	0	0	0	4

Wigeon were seen between September and May, with over 350 present from 30 October to 28 February and a peak of 674 on 14 January. This represented a considerable increase on the 1995/96 peak of 262, a change noticed by other observers. Very few were found after the end of March. The species was found mainly in the lower half of the estuary, and was not seen at Logie.

TEAL *Anas crecca*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
26 8 96	0	0	0	0	0	0	0	6	0	6
11 9 96	0	0	0	0	2	0	0	0	0	2
8 10 96	0	0	0	0	0	0	0	0	8	8
5 11 96	0	0	0	0	0	0	0	0	18	18
28 11 96	0	0	0	0	0	0	0	0	4	4
15 12 96	0	0	0	0	0	0	0	0	6	6
31 12 96	0	0	0	0	0	0	0	0	4	4
15 2 97	0	0	0	0	0	0	0	0	45	45
28 2 97	0	0	0	0	0	0	0	0	12	12
10 3 97	0	0	0	0	0	0	0	5	15	20
18 3 97	0	0	0	0	0	0	0	1	26	27
12 4 97	0	0	0	0	0	0	0	19	0	19
30 4 97	0	0	0	0	0	0	0	18	27	45
3 5 97	0	0	4	0	0	0	0	0	20	24
23 5 97	0	0	0	0	0	0	0	0	3	3
6 6 97	0	0	0	0	0	0	0	0	2	2

As in previous years, Teal were seen throughout the year in small numbers, with most in spring. The birds were found mainly in the upper parts of the estuary (apart from four at the Quay on 3 May). Unlike earlier years, however, the birds were found at Machar as well as at Logie. This may explain the increase in peak number from eight in 1995/96 to 45 in 1996/97; new birds may have started to use the Machar area, or birds on the edge of the reedbeds may have been missed in previous years..

MALLARD *Anas platyrhynchos*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
16 8 96	0	0	0	0	0	0	0	0	2	2
26 8 96	0	0	0	0	0	0	0	0	4	4
11 9 96	0	0	0	0	0	0	0	0	5	5
29 9 96	0	0	0	0	0	0	0	0	3	3
8 10 96	0	0	0	0	0	0	0	0	2	2
30 10 96	0	0	0	0	3	0	0	0	6	9
5 11 96	0	0	0	0	1	0	0	0	0	1
28 11 96	0	0	0	0	32	0	0	0	4	36
15 12 96	0	0	0	0	0	0	0	0	5	5
31 12 96	0	0	0	0	0	0	0	0	1	1
14 1 97	0	0	0	0	0	0	0	0	5	5
28 1 97	0	0	0	0	4	15	0	0	0	19
15 2 97	0	0	0	0	5	4	0	0	0	9
28 2 97	0	0	7	0	0	0	0	0	0	7
10 3 97	0	3	3	0	0	2	0	6	5	19
18 3 97	0	0	5	0	0	0	0	1	5	11
12 4 97	0	1	2	0	0	2	0	0	0	5
30 4 97	0	3	4	0	0	0	0	6	2	15
3 5 97	0	3	0	0	0	3	0	3	5	14
23 5 97	0	2	0	0	2	0	0	6	0	10
6 6 97	0	0	0	0	0	0	2	2	1	5

Mallard occurred in all months except July, in rather erratic numbers, with a peak of 36 on 28 November, a little lower than the peak of 42 in the previous year. The species was found throughout the estuary, apart from the Mouth.

GOLDENEYE *Bucephala clangula*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
28 11 96	1	1	4	0	9	0	0	0	0	15
15 12 96	3	2	4	0	2	0	2	2	3	18
31 12 96	9	4	3	0	0	0	0	1	2	19
14 1 97	8	1	4	0	2	0	0	3	4	22
28 1 97	7	3	6	0	3	2	6	1	1	29
15 2 97	4	3	5	0	2	1	0	0	0	15
28 2 97	4	0	2	0	3	0	0	0	0	9
10 3 97	5	1	0	0	8	2	4	3	2	25
18 3 97	0	1	1	0	1	4	0	5	5	17
12 4 97	0	0	0	0	2	2	0	0	0	4
30 4 97	0	1	0	0	9	0	0	1	0	11

Small numbers of Goldeneye occurred throughout the estuary from November to April, with a peak of 29 on 28 January, similar to that of 26 in 1995/96.

RED-BREASTED MERGANSER *Mergus serrator*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
11 9 96	14	0	0	0	0	0	0	0	0	14
8 10 96	15	10	0	0	0	0	0	0	0	25
30 10 96	14	9	0	0	5	0	0	0	0	28
5 11 96	4	18	0	0	3	3	0	0	0	28
28 11 96	4	4	6	0	6	1	3	0	2	26
15 12 96	8	4	4	0	2	2	0	0	0	20
31 12 96	1	6	1	0	0	0	0	0	1	9
14 1 97	3	4	4	0	0	0	1	0	0	12
28 1 97	3	1	3	0	0	2	0	0	0	9
15 2 97	4	6	4	0	3	0	0	0	0	17
28 2 97	1	6	4	0	3	0	0	0	0	14
10 3 97	6	0	3	0	11	0	2	0	0	22
18 3 97	4	3	3	0	0	4	0	0	0	14
12 4 97	3	1	2	0	2	0	0	0	0	8
30 4 97	0	0	0	0	1	3	0	0	0	4
3 5 97	2	1	5	0	0	0	0	0	0	8
23 5 97	0	3	0	0	0	0	0	0	0	3
24 6 97	0	0	1	0	0	0	0	0	0	1

Mergansers were recorded throughout the estuary, from September onwards, with a peak of 28 on 30 October (and 5 November), almost exactly the same as the highest count in the previous year (27).

OYSTERCATCHER *Haematopus ostralegus*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
18 7 96	91	124	6	0	11	2	5	4	2	245
29 7 96	133	90	18	19	13	3	2	3	0	281
16 8 96	157	166	12	2	2	0	3	0	0	342
26 8 96	151	292	13	0	0	0	0	0	0	456
11 9 96	193	207	8	0	0	2	0	0	0	410
29 9 96	154	105	6	0	11	0	0	0	0	276
8 10 96	145	218	7	2	5	0	0	0	0	377
30 10 96	165	79	0	0	8	1	0	0	0	253
5 11 96	111	59	17	3	10	5	0	0	0	205
28 11 96	158	82	11	1	7	5	4	0	0	268
15 12 96	104	73	16	0	5	2	1	0	0	201
31 12 96	117	78	23	1	6	0	0	0	0	225
14 1 97	84	59	18	0	17	0	22	6	0	206
28 1 97	105	67	27	0	6	0	17	0	0	222
15 2 97	52	87	34	0	23	3	2	0	0	201
28 2 97	56	50	8	0	10	2	0	63	0	189
10 3 97	74	42	4	3	9	1	3	13	0	149
18 3 97	24	42	14	5	23	12	0	65	2	187
12 4 97	4	24	4	3	0	7	2	14	0	58
30 4 97	24	20	7	9	4	12	0	5	0	81
3 5 97	19	15	4	4	7	1	0	0	0	50
23 5 97	12	13	3	3	2	0	0	0	0	33
6 6 97	17	14	0	2	14	6	3	0	2	58
24 6 97	25	39	3	0	2	7	4	0	2	82

Oystercatchers were found mainly in the lower part of the estuary throughout the year, with a peak of 456 on 26 August, a small increase from the peak of 435 in 1995/96.

RINGED PLOVER *Charadrius hiaticula*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
18 7 96	2	0	5	0	0	0	0	0	0	7
29 7 96	3	0	22	0	0	0	0	0	0	25
16 8 96	51	3	26	0	2	14	4	0	0	100
26 8 96	9	9	20	0	1	0	0	0	0	39
11 9 96	0	0	10	0	0	0	0	0	0	10
29 9 96	0	0	14	0	0	0	0	0	0	14
28 11 96	0	0	0	0	0	4	0	0	0	4
15 12 96	0	0	0	0	0	0	11	0	0	11
15 2 97	0	0	0	0	0	2	0	0	0	2
28 2 97	0	0	1	0	0	20	0	0	0	21
10 3 97	0	0	0	0	0	0	11	0	0	11
18 3 97	0	0	1	0	0	0	0	0	0	1
30 4 97	0	0	24	0	0	0	0	0	0	24
3 5 97	0	10	35	0	0	0	0	0	0	45
23 5 97	2	66	0	0	0	0	0	0	0	68
24 6 97	0	0	1	0	0	1	0	0	0	2

Ringed Plovers were found in most parts of the estuary, except Tarty, Machar and Logie, but tended to occur in more upstream sections in winter. Numbers were generally low, apart from an exceptional peak of 100 on 16 August, an increase on the peak of 63 in 1995/96, which itself had increased from 39 in 1994/95.

GOLDEN PLOVER *Pluvialis apricaria*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
29 7 96	0	0	0	0	80	10	0	0	0	90
16 8 96	0	34	0	0	57	299	0	0	0	390
26 8 96	28	440	40	0	110	670	0	0	0	1288
11 9 96	0	4	0	0	0	0	0	0	0	4
29 9 96	1	9	350	0	415	0	0	5	0	780
8 10 96	0	43	68	0	1250	320	700	0	0	2381
30 10 96	0	2811	80	0	0	0	0	0	0	2891
5 11 96	0	1050	0	0	0	0	675	0	0	1725
28 11 96	45	4	0	0	0	29	0	0	0	78
15 12 96	0	1	0	0	0	0	0	0	0	1
31 12 96	0	20	0	0	0	0	0	0	0	20
14 1 97	12	7	56	0	0	0	0	0	0	75
28 1 97	0	0	0	0	0	10	0	0	0	10
28 2 97	0	0	0	0	0	0	300	0	0	300
18 3 97	0	0	0	0	4	130	0	0	0	134

As in previous years, Golden Plovers occasionally occurred in very high numbers, especially in October, with most of the birds in Inches, Sleek or Haddo. The peak count of 2,891 on 30 October was much larger than the highest count of 1,300 in 1995/96, although still lower than the 3,066 seen in 1993/94.

LAPWING *Vanellus vanellus*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
18 7 96	0	1	1	0	29	62	15	133	14	255
29 7 96	0	0	6	10	188	31	72	263	8	578
16 8 96	0	0	25	25	57	76	77	43	0	303
26 8 96	0	7	88	120	255	110	367	1000	248	2195
11 9 96	0	2	626	0	0	26	0	0	0	654
29 9 96	0	1	594	0	300	150	0	150	0	1195
8 10 96	0	4	253	250	216	860	160	0	0	1743
30 10 96	0	89	470	0	0	189	0	0	0	748
5 11 96	0	26	150	0	65	206	400	250	0	1097
28 11 96	0	4	146	0	0	19	16	26	0	211
15 12 96	0	0	7	0	72	4	40	12	0	135
31 12 96	0	26	79	0	1	78	0	16	0	200
14 1 97	0	38	264	0	0	64	21	0	0	387
28 1 97	0	0	86	0	12	420	352	0	0	870
15 2 97	0	0	2	0	26	510	311	0	0	849
28 2 97	0	0	0	0	174	50	858	40	0	1122
10 3 97	0	0	150	0	0	8	57	34	0	249
18 3 97	0	0	23	2	0	88	70	25	0	208
12 4 97	0	0	0	1	0	34	0	0	0	35
30 4 97	0	0	5	6	0	25	1	9	0	46
3 5 97	0	0	0	0	0	2	0	2	0	4
23 5 97	0	0	0	0	0	0	0	8	0	8
6 6 97	0	0	1	0	0	0	3	0	0	4
24 6 97	0	0	0	0	3	0	1	54	0	58

Lapwings also occurred erratically in high numbers, with a peak of 2,195 on 26 August, a much higher number than the peak of 650 in the previous year. Golden Plovers also occurred in large numbers on 26 August, suggesting a general movement of plovers. Numbers were low from April to June. The species tended to occur closer to the mouth of the estuary in winter.

KNOT *Calidris canutus*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
29 7 96	0	0	0	0	10	0	0	0	10	10
16 8 96	0	0	4	0	0	0	0	0	0	4
26 8 96	0	25	1	6	0	0	0	0	0	32
11 9 96	0	0	4	0	0	0	0	0	0	4
29 9 96	3	0	0	0	5	0	0	1	0	9
8 10 96	0	0	0	0	1	0	0	0	0	1
30 10 96	29	0	0	0	0	0	0	0	0	29
5 11 96	20	0	0	0	0	0	0	0	0	20
28 11 96	40	0	5	0	0	0	0	0	0	45
15 12 96	3	0	0	0	0	0	0	0	0	3
31 12 96	0	25	0	0	0	0	0	0	0	25
14 1 97	60	0	0	0	0	0	0	0	0	60
28 1 97	73	0	0	0	0	0	18	0	0	91
15 2 97	40	5	0	0	0	0	0	0	0	45
29 2 97	92	0	0	0	0	0	0	0	0	92
10 3 97	50	0	0	0	0	0	0	0	0	50

Knot were found on the estuary from July to March, most commonly at the Mouth or Inches. The highest count of 92 on 29 February was higher than the peak of 78 in 1995/96.

DUNLIN *Calidris alpina*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
18 7 96	0	0	10	0	37	0	4	0	0	51
29 7 96	51	0	3	0	1	0	3	0	0	58
16 8 96	2	8	20	0	21	12	15	13	0	91
26 8 96	10	40	2	0	0	20	20	0	0	92
11 9 96	10	84	19	0	0	0	0	0	0	113
29 9 96	1	88	10	0	232	180	0	76	47	634
8 10 96	0	5	23	26	240	20	160	39	0	513
30 10 96	0	1	0	20	0	60	0	24	0	105
5 11 96	4	0	0	0	0	0	0	0	0	4
28 11 96	100	0	70	0	6	48	0	15	0	239
15 12 96	0	0	100	0	0	0	110	3	0	213
31 12 96	6	80	0	0	180	800	0	230	0	1296
14 1 97	0	0	1	1	0	1400	131	52	0	1585
28 1 97	28	25	92	0	0	0	3	250	0	398
15 2 97	63	0	17	0	0	59	130	0	0	269
28 2 97	0	0	28	0	0	40	40	0	0	108
10 3 97	0	0	17	0	0	51	8	38	0	114
18 3 97	14	0	2	0	0	0	0	0	0	16
12 4 97	0	20	0	0	0	5	0	0	0	25
30 4 97	0	0	6	0	4	0	0	0	0	10
3 5 97	1	10	60	0	0	0	0	0	0	71
23 5 97	0	5	0	0	0	0	0	0	0	5
6 6 97	2	0	0	0	0	0	0	0	0	2

Dunlin occurred in all months and were found throughout the estuary (although only once at Logie, on 29 September). Very high numbers were seen in late December and mid-January, with the peak count of 1,585 on 14 January very much higher than the peak of 409 in the previous year. There was evidence of a large cold-weather influx of Dunlin in mid-winter, when birds of the Continental race were caught in cannon-nets (R. Rae, pers. comm.). However, apart from high counts on 31 December and 14 January, numbers were generally similar to those in the previous year.

BAR-TAILED GODWIT *Limosa lapponica*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
18 7 96	0	0	0	0	2	3	0	1	0	6
29 7 96	0	0	5	1	1	0	1	0	0	8
16 8 96	0	2	1	0	6	3	0	0	0	12
26 8 96	0	8	3	0	0	0	0	0	4	15
11 9 96	1	2	0	0	0	0	0	0	0	3
29 9 96	0	4	4	0	0	0	0	0	0	8
8 10 96	0	5	0	0	0	0	0	0	0	5
30 10 96	0	8	5	0	2	0	0	0	0	15
5 11 96	0	10	4	0	0	0	0	0	0	14
28 11 96	0	18	2	1	2	0	0	0	0	23
28 11 96	0	18	2	1	2	0	0	0	0	23
15 12 96	1	20	0	0	3	4	0	0	0	28
31 12 96	0	6	12	0	4	13	10	0	0	45
14 1 97	0	38	2	0	1	0	31	0	0	72
28 1 97	0	12	4	0	15	0	6	0	0	37
15 2 97	0	5	13	0	11	0	7	0	0	36
28 2 97	0	7	0	0	3	2	18	0	0	30
10 3 97	1	0	0	0	0	1	47	0	0	49
18 3 97	0	0	0	0	33	2	0	0	0	35
12 4 97	0	0	0	0	0	1	7	0	0	8
30 4 97	0	0	0	0	0	1	5	0	0	6
3 5 97	0	0	0	0	1	3	3	0	0	7
23 5 97	0	0	0	0	0	0	6	0	0	6
6 6 97	0	0	0	0	0	0	1	0	0	1
24 6 97	0	1	1	0	0	0	0	0	0	2

Bar-tailed Godwits were seen throughout the year and in most parts of the estuary, (with the exception of Machar and Logie), but they were rarely seen at the Mouth and at Tarty. Few were recorded between March and August. The peak count of 72 on 14 January, which coincided with a general influx of waders, (associated with cold weather), was considerably higher than the highest count of 34 in the previous year, but otherwise numbers were rarely over 40.

CURLEW *Numenius arquata*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
18 7 96	0	73	5	0	4	44	28	19	0	173
29 7 96	6	55	10	28	104	26	106	4	0	339
16 8 96	1	166	4	0	21	44	85	8	0	329
26 8 96	4	181	5	60	81	70	128	13	0	542
11 9 96	4	82	1	1	14	47	18	171	0	338
29 9 96	4	67	10	0	305	15	5	12	2	420
8 10 96	6	64	3	0	32	2	4	0	1	112
30 10 96	4	65	0	22	106	13	0	0	2	212
5 11 96	5	42	9	11	0	8	0	4	1	80
28 11 96	237	98	10	3	150	3	12	8	2	523
15 12 96	6	22	1	0	4	31	1	0	1	66
31 12 96	3	40	3	5	12	2	4	4	1	74
14 1 97	1	39	12	48	4	0	16	3	2	125
28 1 97	120	462	8	6	78	7	54	50	0	785
15 2 97	3	40	10	142	6	60	8	60	1	330
28 2 97	5	65	3	0	79	12	32	0	0	196
10 3 97	2	13	4	17	3	41	10	7	0	97
18 3 97	0	33	5	46	408	158	0	0	0	650
12 4 97	1	16	4	2	157	50	120	0	0	350
30 4 97	0	9	3	11	37	3	53	0	0	116
3 5 97	0	1	13	1	7	13	0	0	0	35
23 5 97	0	3	0	5	43	0	17	0	0	68
6 6 97	1	0	0	0	3	1	2	0	0	7
24 6 97	0	24	15	0	54	12	0	0	0	105

Curlew were seen in all months in all parts of the estuary, although few were found at Logie. The highest count of 785 on 28 January was very much higher than the peak of 241 in the previous year, but was lower than the count of 812 recorded in 1993/94.

REDSHANK *Tringa totanus*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
18 7 96	0	3	22	0	103	52	19	93	4	296
29 7 96	1	28	118	17	127	72	7	81	0	451
16 8 96	1	238	48	92	240	86	253	418	6	1382
26 8 96	7	331	104	30	533	230	250	70	7	1562
11 9 96	16	964	46	30	224	127	2	22	4	1435
29 9 96	7	101	60	26	515	50	160	32	2	953
8 10 96	14	226	8	80	270	15	10	8	8	639
30 10 96	6	72	7	42	252	68	0	12	2	461
5 11 96	4	53	2	44	54	69	25	6	3	260
28 11 96	9	44	10	58	153	50	28	16	2	370
15 12 96	9	21	2	41	87	29	12	9	1	211
31 12 96	4	58	26	23	186	40	14	14	1	366
14 1 97	1	28	20	34	41	39	20	7	0	190
28 1 97	12	38	10	38	231	0	28	40	1	398
15 2 97	5	23	7	22	134	33	35	0	3	262
28 2 97	6	34	3	30	109	50	6	20	1	259
10 3 97	2	12	6	6	80	70	60	26	1	263
18 3 97	0	23	2	59	123	56	60	33	9	365
12 4 97	0	43	22	22	88	116	0	94	0	385
30 4 97	0	0	1	3	0	18	90	40	5	157
3 5 97	0	0	0	6	42	3	0	41	3	95
23 5 97	0	0	0	2	0	0	0	17	2	21
6 6 97	0	0	0	0	0	0	3	5	0	8
24 6 97	0	0	0	2	0	0	0	49	0	51

Redshanks were recorded in all months, in all parts of the estuary (although in low numbers at Logie), with high totals in autumn and low numbers in May and June. The peak count of 1,562 on 26 August was very much higher than the highest count of 456 in 1995/96, but apart from very high numbers on 16 August, 26 August and 11 September, counts were similar to those in the previous year.

TURNSTONE *Arenaria interpres*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
29 7 96	0	0	1	0	0	0	0	0	0	1
16 8 96	1	0	1	0	0	0	0	0	0	2
26 8 96	6	2	0	0	0	0	0	0	0	8
11 9 96	0	0	6	0	0	0	0	0	0	6
29 9 96	3	0	0	0	0	0	0	0	0	3
8 10 96	7	5	0	0	0	0	0	0	0	12
30 10 96	3	8	4	0	8	0	0	0	0	23
5 11 96	7	2	0	0	0	4	0	0	0	13
28 11 96	2	2	0	0	9	0	0	0	0	13
15 12 96	6	0	0	0	2	0	1	0	0	9
31 12 96	0	0	0	0	2	0	0	0	0	2
14 1 97	1	2	0	0	14	0	0	0	0	17
28 1 97	0	4	0	0	0	0	0	0	0	4
28 2 97	1	0	1	0	0	0	0	0	0	2
10 3 97	0	0	1	0	6	0	2	0	0	9
18 3 97	0	2	12	0	0	0	0	0	0	14
30 4 97	0	0	10	0	0	0	0	0	0	10
3 5 97	3	0	1	0	0	0	0	0	0	4

Turnstones were seen in all months except June and occurred in all parts of the estuary except for Machar and Logie. The highest count of 23 on 30 October was lower than the peak of 100 in the previous year.

b) Total number of birds on the estuary

The total number of birds of all species was calculated for each count date and the mean taken for each month. Since Eiders were so numerous, they were considered separately.

Mouth	Eiders	Other species	Total
1996			
July	2,100	1,520	3,620
August	1,842	4,717	6,559
September	942	3,859	4,801
October	834	5,618	6,462
November	481	3,134	3,615
December	720	1,976	2,696
1997			
January	616	3,520	4,136
February	556	2,787	3,343
March	441	1,560	2,001
April	1,763	1,055	2,818
May	3,287	433	3,720
June	2,439	342	2,781

The total number of birds of all species on the estuary fluctuated considerably, with peaks in August, October and (to a lesser extent) in January, resulting from large changes in the numbers of species other than Eiders (figure 2). In contrast, Eiders were by far the commonest species in May and June, when they were responsible for another (smaller) peak in total bird numbers.

c) Comparison between 1995/96 and 1996/97

(i) Total number of birds

The peak monthly mean totals of birds of all species (including Eiders) were in all months except December much higher in 1996/97 than in 1995/96 (see section b), above). In some months, the difference was very large, with highest values of 6,559 and 6,462 in 1996/97 compared to 3,637 and 3,575 in 1995/96.

Although there were more Eiders in 1996/97 than in the previous year, with a mean count of 3,287 in May 1997 compared to only 1,544 in May 1996, there was also a considerable increase in the numbers of birds of other species. The peak monthly mean total of these species, 5,618 in October 1996, was more than double the peak count in the previous year (2,541 in December 1995). However, as was emphasised in previous reports, such peak monthly values may be affected by year-to-year differences in the timing and extent of migratory movements and so may not be meaningful in making comparisons between years. In particular, a number of species (eg Dunlin and Redshank) occurred in unusually large numbers for two or three consecutive counts and made a considerable contribution to the estuary totals for the months concerned, but for the rest of the year were found in numbers similar to those in previous years.

A less variable measure, however, the mean monthly total of species other than Eiders over the whole autumn and winter (August to February) also showed a large increase, from 1,700 in 1995/96 to 3,365 in 1996/97. All of the various comparisons thus showed strong evidence of an increase in bird numbers between the two years.

(ii) Individual species

For each of the commonly-recorded species, the mean of the three highest counts in 1996/97 was compared with the same measure for the previous year (Patterson and Laing 1996).

Species	1995/96	1996/97	Change
Shelduck	67	105	+
Eider	2,667	3,576	+
Wigeon	247	591	+
Teal	6	39	+
Mallard	36	25	-
Goldeneye	21	25	+
Red-breasted Merganser	23	27	+
Oystercatcher	366	414	+
Ringed Plover	46	71	+
Golden Plover	595	2,332	+
Lapwing	574	1,711	+
Knot	64	81	+
Dunlin	381	1,172	+
Bar-tailed Godwit	31	55	+
Curlew	226	659	+
Redshank	439	1,460	+
Turnstone	91	18	-

Of the seven duck species, only the Mallard decreased its peak numbers between 1995/96 and 1996/97, while six increased. Similarly, only one of the 10 wader species (Turnstone) decreased in peak numbers, while nine increased. These data suggest a substantial increase in both duck and wader numbers between the two years, with large increases in several species. This also confirms the increase in total numbers of all species (section (i) above), but the data are subject to the same difficulty, that some species occurred in unusually large numbers in only a few counts out of the whole year.

d) Species which occur less commonly on the Ythan, seen during the surveys

The various species recorded during the year are tabulated below. Comments are added where appropriate.

LITTLE GREBE *Tachybaptus ruficollis*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
28 1 97	0	0	0	0	0	0	0	0	2	2
15 2 97	0	0	0	0	0	0	0	0	1	1
30 4 97	0	0	0	0	0	0	0	1	0	1

A wintering pair remained till the spring.

LITTLE EGRET *Egretta garzetta*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
16 8 96	0	1	0	0	0	0	0	0	0	1

A vagrant, also recorded on the Ythan in 1995/96. There are usually only one or two Scottish records each year.

WHOOOPER SWAN *Cygnus cygnus*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
11 9 96	0	0	0	0	0	0	0	1	0	1
8 10 96	0	0	0	0	0	0	1	0	0	1
28 1 97	0	0	0	0	0	2	0	0	0	2
10 3 97	0	0	0	0	0	1	0	0	0	1
12 4 97	0	0	0	0	0	1	0	0	0	1
30 4 97	0	0	0	0	0	1	0	0	0	1
3 5 97	0	0	0	0	0	0	1	0	0	1
23 5 97	0	0	0	0	0	0	2	0	0	2

One bird, probably with an injured wing, remained all year and was occasionally joined by a second.

PINK-FOOTED GOOSE *Anser brachyrhynchus*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
30 10 96	0	0	0	0	10	0	0	0	0	10
28 11 96	0	0	0	0	34	0	0	0	0	34
31 12 96	1	0	0	0	0	0	0	0	0	1
28 1 97	0	0	0	0	0	0	3	0	0	3
12 4 97	0	0	0	0	46	0	0	0	0	46
30 4 97	0	0	0	0	0	0	0	400	0	400
6 6 97	0	0	0	0	0	0	4	0	0	4
24 6 97	0	0	0	0	0	0	4	0	0	4

GREYLAG GOOSE *Anser anser*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
29 7 96	0	0	0	0	0	0	0	40	0	40
16 8 96	0	0	0	0	0	0	0	37	0	37
26 8 96	0	0	0	0	0	0	37	0	0	37
11 9 96	0	0	0	0	0	0	6	0	0	6
29 9 96	0	0	0	0	0	2	0	0	0	2
30 10 96	0	0	0	0	48	0	0	0	0	48
5 11 96	0	0	0	0	44	0	0	0	0	44
28 11 96	0	0	0	0	20	0	1	0	0	21
31 12 96	0	0	0	0	1	0	0	0	0	1
14 1 97	0	0	0	0	3	0	0	0	0	3
23 5 97	0	0	0	0	1	0	1	0	0	2
24 6 97	0	0	0	0	0	0	2	0	0	2

CANADA GOOSE *Branta canadensis*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
26 8 96	0	0	0	0	0	0	19	0	0	19

Probably the flock normally seen around the Meikle Loch.

BARNACLE GOOSE *Branta leucopsis*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
29 9 96	0	0	0	0	0	0	0	9	0	9
30 4 97	0	0	0	0	0	0	0	3	0	3
3 5 97	0	0	0	0	0	0	8	0	0	8

Probably birds stopping on migration between Svalbard and the Solway

BRENT GOOSE *Branta bernicla*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
14 1 97	0	0	0	0	23	0	0	0	0	23
6 6 97	0	1	0	0	0	0	0	0	0	1

The flock in January included two colour-ringed birds from Denmark, suggesting a cold-weather movement, noted elsewhere on the east coast of Britain. The June bird was also ringed, but was not identified.

GADWALL *Anas strepera*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
14 1 97	0	0	0	1	0	0	0	0	0	1
18 3 97	0	0	0	0	0	0	0	1	0	1
3 5 97	0	0	0	0	0	0	0	2	0	2

PINTAIL *Anas acuta*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
30 4 97	0	0	0	0	0	0	0	9	0	9
3 5 97	0	0	0	0	0	0	7	0	0	7

Probably birds on pre-breeding passage.

SHOVELER *Anas clypeata*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
11 9 96	0	0	0	0	0	0	0	1	0	1

GREY PLOVER *Pluvialis squatarola*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
26 8 96	0	2	0	0	0	0	0	0	0	2
29 9 96	0	0	0	0	3	0	0	0	0	3
8 10 96	2	2	0	0	0	1	0	0	0	5
30 10 96	0	2	0	1	0	0	0	0	0	3
5 11 96	4	5	0	0	0	0	0	0	0	9
28 11 96	6	0	0	0	0	0	0	0	0	6
31 12 96	1	0	0	0	0	0	0	0	0	1
14 1 97	0	0	1	0	0	0	0	0	0	1
15 2 97	1	0	0	0	0	0	0	0	0	1
23 5 97	0	0	0	0	0	0	1	0	0	1

SANDERLING *Calidris alba*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
15 2 97	5	0	0	0	0	0	0	0	0	5

CURLEW SANDPIPER *Calidris ferruginea*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
29 9 96	0	0	0	0	0	7	0	0	0	7

An unusually large group of an irregular passage migrant in the area.

RUFF *Philomachus pugnax*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
16 8 96	0	0	0	0	1	0	0	1	0	2
26 8 96	0	0	0	0	0	0	1	0	0	1
30 4 97	0	0	0	0	0	0	1	0	0	1

SNIPE *Gallinago gallinago*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
29 9 96	0	0	0	0	0	0	0	2	0	2
8 10 96	0	0	0	0	0	0	0	2	0	2
30 10 96	0	3	0	0	0	0	0	0	1	4
10 3 97	0	0	0	1	0	0	0	0	0	1

BLACK-TAILED GODWIT *Limosa limosa*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
29 7 96	0	0	1	1	0	0	0	0	0	2
16 8 96	0	0	0	0	2	0	0	3	0	5
26 8 96	0	2	0	0	0	0	0	0	0	2
11 9 96	0	12	0	0	0	0	0	0	0	12
29 9 96	0	2	0	0	24	0	0	0	0	26
23 5 97	0	0	0	0	0	0	0	1	0	1

Unusually high autumn numbers of a species which is generally scarce in the area.

WHIMBREL *Numenius phaeopus*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
18 7 96	0	6	2	0	0	1	2	0	0	11
29 7 96	1	5	0	10	2	0	38	0	0	56
30 4 97	0	0	0	0	3	0	0	0	0	3
3 5 97	0	0	1	0	2	0	7	0	0	10
23 5 97	0	1	0	0	0	0	0	0	0	1

The count of 56 is probably one of the highest summer counts for Aberdeenshire, since numbers are usually lower than in autumn.

SPOTTED REDSHANK *Tringa erythropus*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
11 9 96	0	0	0	0	0	0	0	0	2	2

An uncommon species in Aberdeenshire, although a few are seen in most years.

GREENSHANK *Tringa nebularia*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
29 7 96	0	0	0	0	0	3	1	0	0	4
16 8 96	0	0	0	7	2	3	1	4	0	17
26 8 96	0	1	0	2	1	6	2	1	6	19
11 9 96	0	1	0	1	0	0	1	0	4	7
29 9 96	0	1	1	0	4	1	0	0	1	8
8 10 96	0	0	0	0	0	1	0	0	0	1
30 10 96	0	0	0	1	0	0	0	0	0	1
30 4 97	0	0	0	0	0	1	1	0	0	2
3 5 97	0	0	0	0	1	0	0	1	0	2
24 6 97	0	0	0	0	0	0	0	1	0	1

Unusually high numbers on autumn passage.

DISCUSSION

The 1996/97 Ythan survey showed a striking increase in the number of birds, of almost all species. The increase in Eiders can be accounted for only partly by the entry of the large 1995 year class of young into the breeding population and so presumably means that many birds which failed to appear on the Ythan in 1996 had nevertheless survived and were able to return in 1997. Alternatively, there may have been immigration from other populations (although there have been no ring recoveries to suggest this).

The increase in the total of birds other than Eiders was dominated by a few species which occurred in unusually large numbers for a few (usually consecutive) counts. Apart from these, most species for most of the year were found in numbers which were similar to those of previous years. Some of the large influxes (which were confirmed as unusual by local birdwatchers and by comparison with observations over the previous three years by PJC) coincided with hard weather on the Continent and so may have been cold-weather movements. The large numbers of Golden Plovers and Lapwings in autumn, however, were not associated with cold weather and presumably reflected large-scale post-breeding movements through the area. It is also possible that this increase was associated with a considerable decrease in the amount of algal cover on the estuarine mudflats in the summer of 1996 (D.G. Raffaelli *pers. comm.*), which may have increased the density of invertebrate animals.

The particularly large fluctuations in numbers of individual species recorded in 1996/97 highlight the difficulty in making realistic comparisons between years. The use of the largest peak count (or even in 1996/97, the mean of the highest

three) is likely to give a misleading high value, unrepresentative of most of the year. Peak values are also greatly affected by the timing of individual counts in relation to the migratory movements of each species. On the other hand, the use of an overall mean number for each species over the whole year or part of it (eg winter) may also be misleading, since it may include part of the year when a species is expected to be present in only very small numbers (eg Shelduck in early winter; most waders in summer). Perhaps an intermediate value, such as the median count for a defined period when each species was expected to be present, would be a more realistic measure to use in comparisons between years.

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APPENDIX 1. SURVEY METHODS

The birds were counted twice each month at approximately fortnightly intervals. Counts were made at low tide, when most species were dispersed while feeding on the intertidal area, and were carried out only when visibility was good. Each survey started at the river mouth and progressed upstream, with each section of the estuary counted from a central vantage point which gave a good view of the whole intertidal area of the section (Fig. 1). Most counts took about two hours.

While such low tide counts were appropriate for the majority of species, it was not possible to count Eider Ducks *Somateria mollissima* since they formed large dense continuously-diving flocks while feeding so that accurate counts could not be made. Separate surveys, at high tide, when the Eiders were roosting on the shoreline, were necessary; these were carried out (if possible on the same day as the low-tide count) throughout the year. In addition, during the breeding season, Eiders on the coast between Collieston and the estuary mouth were counted as part of a separate study of the Eider breeding population and its production of juveniles.

The standard counts were also inadequate to measure the breeding population of Shelduck *Tadorna tadorna*. Although this species can be counted easily at low tide, a large proportion of the birds are absent from the estuary while visiting the nesting areas on Forvie in the morning. Since many of the counts were carried out before noon (so as to avoid problems with heat haze and human disturbance) a proportion of the Shelduck population could be missed.

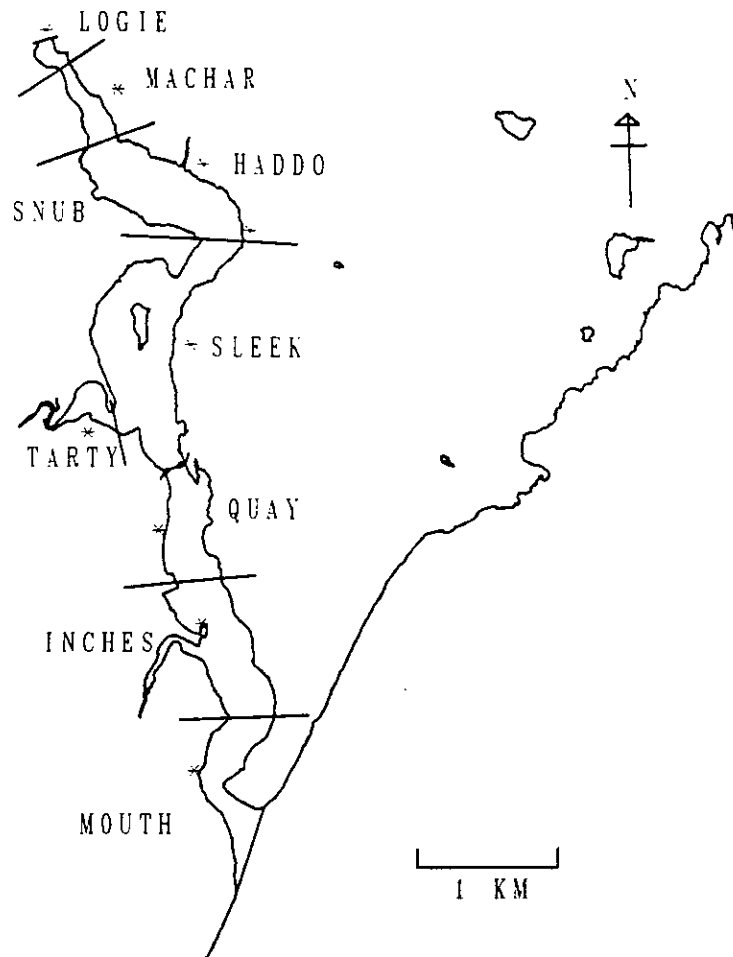


Figure 1. The Ythan estuary, showing the counting sections and count points (asterisks). The division between the Snub and Haddo areas is the centre of the low-tide river channel.

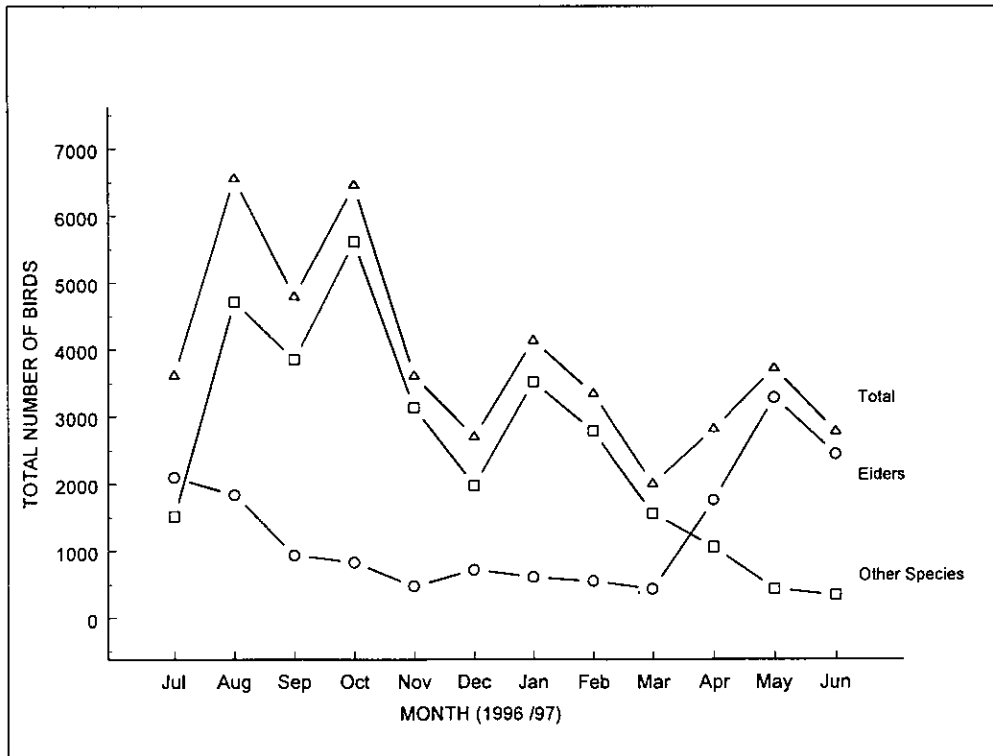


Figure 2. The mean number of Eiders (circles), birds of other species (squares) and the total of birds of all species (triangles) on the Ythan estuary in 1996/97.

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