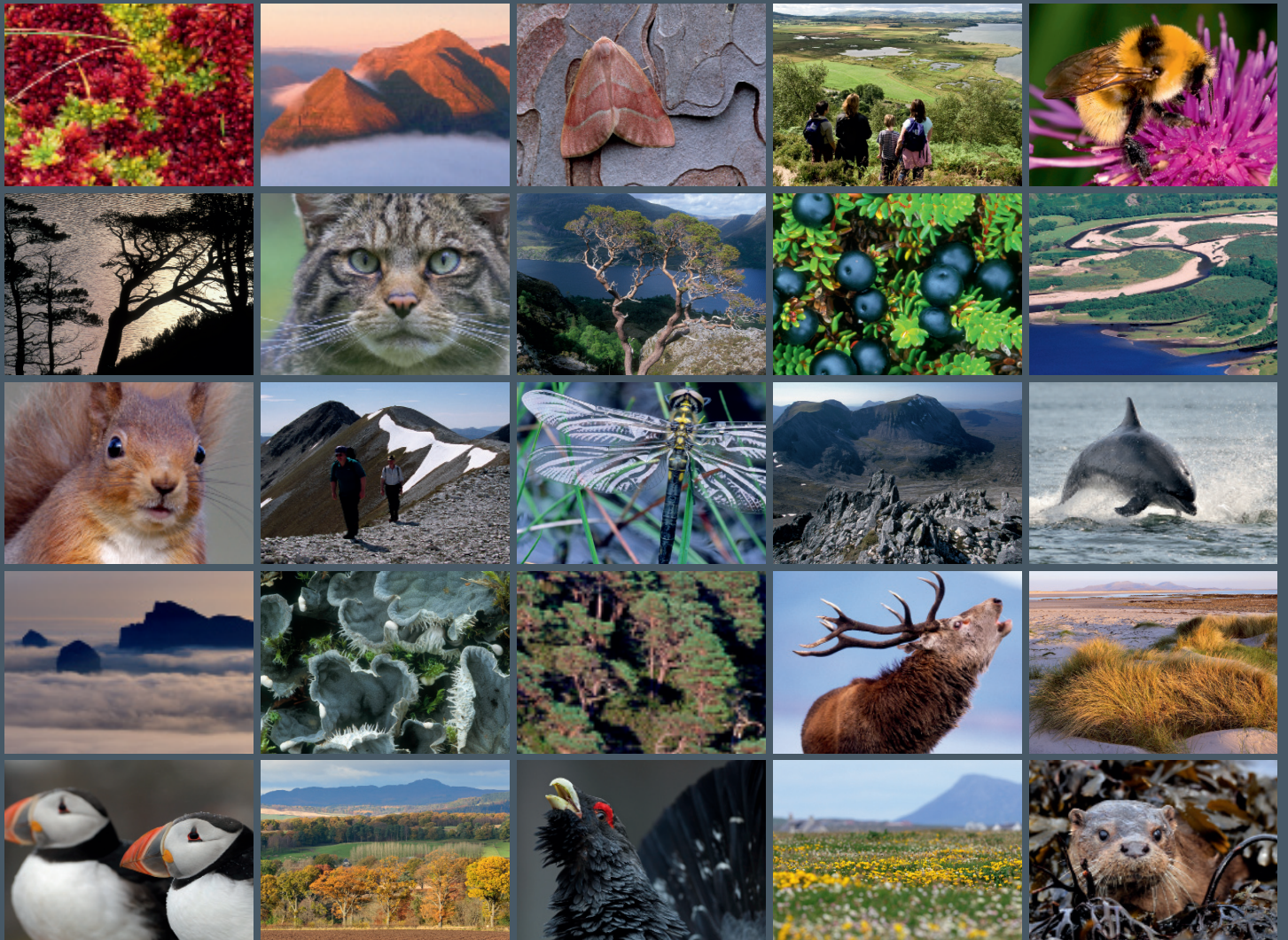


# Waders and wildfowl on the Ythan Estuary 1991/1992





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**Archive Report No. 001**

## **Waders and wildfowl on the Ythan Estuary 1991/1992**

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**WADERS AND WILDFOWL ON THE  
YTHAN ESTUARY**

**1991/1992**

**I J Paterson & R M Laing**

**NE/91/211**

APPENDIX 1

NE (SCOTLAND) REGION CONTRACT REPORTS

Report No : NE/91/211

File No : EG/110/RS

Contract No : 07/91/F4A/211

Date Received : 1 September 1992

Report Title : Waders and waterfowl on the Ythan Estuary 1991/92

Contract Title : Ythan Estuary, wader and wildfowl counts

Nominated Officer : Mr Murray Ferguson

Contractor : Aberdeen University -  
Culterty Field Station. Dr  
I J Patterson and R M Laing

Comments : This is the first of 5  
reports. There will be a  
report for the next 4  
winters

Storage Location of Additional Field data :

Restriction : None

Number of copies received : Three, photocopied to 5

Distribution : 1 East Grampian Area Office  
- Library  
2 Area Office - Mr Murray  
Ferguson  
3 Area Officer, Forvie NNR  
- Bob Davis  
4 RHQ - Aberdeen Library  
5 SHQ - Bommington Bond  
Library

Report Summary :

In recent years there has been concern that there have been progressive changes to the Ythan Estuary which may have serious impacts on wildlife including increased algal growth and ever-greater human impact through sport and recreation. This report gives an account of the numbers and distribution of each species during twice monthly counts. These are short sections on the total number of birds on the estuary, the total number and density of birds in different parts of the estuary, and a comparison between years.

**WADERS AND WATERFOWL ON THE YTHAN ESTUARY 1991/92:  
A REPORT TO SCOTTISH NATURAL HERITAGE, JULY 1992**

I J Patterson and R M Laing  
Aberdeen University Zoology Department  
Culterty Field Station

**INTRODUCTION AND AIMS**

The Ythan estuary, part of the Forvie and Ythan N.N.R., is widely recognised as a well-documented example of a relatively unpolluted estuary with a long series of studies carried out on the ecosystem and most of its component species over a period of almost 40 years. In recent years, however, there have been progressive changes to the estuarine environment, chiefly nutrient enrichment, increased algal growth and ever-greater human impact through sport and recreation, which may have serious impacts on wildlife. It is thus very important to monitor the population levels of key species on the estuary, so as to detect any progressive changes in numbers or distribution which might occur.

The aims of the present study were a) to count the total number of each wader and waterfowl species on the Ythan estuary twice each month and b) to describe each species' distribution over the estuary.

### METHODS

The birds were counted, usually by R.M. Lang, 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, except for September and early October. In addition, during the breeding season, Eiders on the coast between Collieston and the estuary mouth were counted as part of a separate study, funded by BP through SNH, which monitors the breeding population and its production of juveniles each year (Patterson & Laing, unpublished report to SNH 1991).

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 was usually missed. Separate surveys of the Shelduck breeding population were carried out on afternoon low tides in May, as part of a national Shelduck survey organised by the Wildfowl and Wetlands Trust.

### RESULTS

The data are presented in separate species accounts, arranged in taxonomic order. For each species, 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; Fig. 1), and the total for the whole estuary, are shown in a table. The peak count and the mean of the three highest counts (which reduces the effect of any unusually-high totals) are shown for the current year's data and for the winter counts made from September (December in 1988) to March/April in 1988/89, 1989/90 and 1990/91 by the same observer. (The data for these earlier years are held at Aberdeen University Zoology Department, Culterty Field Station, Newburgh, Grampian).

Shelduck *Tadorna tadorna*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
4 4 91	0	4	6	12	0	6	0	0	0	28
23 4 91	0	2	0	8	18	4	6	0	0	38
22 5 91	0	2	2	4	6	12	12	2	0	40
30 5 91	0	0	4	4	4	6	12	0	0	30
5 6 91	0	0	4	6	2	6	8	0	2	28
19 6 91	0	0	3	2	2	6	14	2	4	33
5 8 91	0	0	0	0	0	0	3	0	0	3
12 9 91	0	0	0	0	3	0	0	0	0	3
26 11 91	0	0	0	0	0	2	0	0	0	2
10 12 91	0	0	0	0	0	4	0	0	0	4
27 1 92	0	0	2	0	2	0	0	0	0	4
6 2 92	0	0	0	2	0	27	0	0	0	29
26 2 92	0	6	0	0	0	24	7	4	4	45
9 3 92	2	4	4	0	14	18	6	2	4	54
26 3 92	0	0	2	2	10	8	10	2	0	34
10 4 92	0	0	2	2	12	6	12	2	0	36
23 4 92	0	2	0	12	20	6	2	2	0	44
6 5 92	0	2	2	4	8	12	10	2	0	40
20 5 92	2	4	0	14	2	14	32	0	2	70

	1988/89	1989/90	1990/91	1991/92
Peak count	67	36	52	70
Mean of three highest counts	57	34	50	56

Shelducks were recorded in all months of the year except July, but occurred in very low numbers from August to December when the majority were on their moult migration. Peak numbers in May 1992 were similar to those in 1988/89, when counting continued till mid-April. Counts in 1989/90 and 1990/91 were not comparable, since they ended in March.

Surveys specifically designed for Shelducks, carried out on afternoon low tides, gave a mean total of 98 on the estuary in May 1991 and 95 in May 1992. When an incubating female was added for each solitary territorial male found on the count and the Shelducks on the river Ythan above Logie, and on freshwater pools near the Ythan are added, the total local breeding population was estimated to be 148 in May 1991 and 136 in May 1992. A total of only 15 juveniles fledged were counted in late July 1991.

Eider *Somateria mollissima*

	DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
15	4	91	1758	6	557	0	47	4	0	0	2372
18	4	91	1221	758	209	0	39	4	0	0	2231
29	4	91	2691	0	0	572	151	4	0	0	3418
7	5	91	1900	2364	153	0	60	0	0	0	4477
14	5	91	1298	1732	556	0	95	6	0	0	3687
20	5	91	1650	2022	339	0	180	19	0	0	4210
28	5	91	1469	1669	111	0	173	0	0	0	3422
4	6	91	1324	1491	268	0	211	4	0	0	3298
13	6	91	3173	440	219	0	43	0	0	0	3875
25	7	91	908	0	56	0	0	1	0	0	965
30	7	91	888	0	93	0	0	1	0	0	982
12	8	91	305	0	0	0	0	0	0	0	305
23	8	91	370	0	0	0	0	0	0	0	370
25	10	91	757	345	44	0	0	0	0	0	1146
15	11	91	396	450	146	0	0	0	0	0	992
26	11	91	458	615	59	0	0	0	0	0	1132
10	12	91	23	431	609	0	6	0	0	0	1069
18	12	91	42	147	823	0	44	0	0	0	1056
16	1	92	67	462	456	0	0	0	0	0	985
31	1	92	26	139	577	0	25	0	0	0	767
14	2	92	395	59	371	0	5	0	0	0	830
27	2	92	464	273	80	0	23	0	0	0	840
3	3	92	34	5	380	0	145	0	0	0	564
20	3	92	544	0	322	0	94	0	0	0	960
14	4	92	2748	32	164	0	35	5	0	0	2984
28	4	92	3144	22	130	0	54	2	0	0	3352
11	5	92	1969	921	411	0	92	2	12	0	3407
15	5	92	1862	2033	233	0	82	22	0	0	4232
19	5	92	2701	903	402	0	137	27	0	0	4170
22	5	92	2732	854	453	0	154	36	0	0	4229
25	5	92	2660	1105	207	29	65	8	0	0	4074
28	5	92	2562	1567	313	19	68	7	0	0	4536
10	6	92	2198	787	431	0	77	14	0	0	3507
16	6	92	1123	116	167	0	0	9	0	0	1415

Eiders were found on the estuary throughout the year, with peaks of 4,477 in May 1991 and 4,536 in May 1992. Numbers dropped to 370 during the late summer moult and to 564 at the end of the winter.

When the birds on the sea coast between Collieston to the estuary mouth were added the peak breeding population in 1991 was 5,048 (3,078 adult males, 1,750 adult females and 220 first-year males) and in 1992 was 5,059 (3,735 adult males, 1,252 adult females and 72 first-year males). These totals were consistent with the mean population level over the last 10 years (Patterson & Laing, unpublished report to SNH, 1991).

Wigeon *Anas penelope*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
4 4 91	0	0	0	0	22	12	0	0	0	34
23 4 91	0	0	0	0	0	41	0	0	0	41
19 6 91	0	0	0	0	0	0	10	0	0	10
12 9 91	0	0	0	0	0	3	0	0	0	3
27 9 91	0	0	0	0	29	0	64	0	0	93
9 10 91	18	0	0	0	76	0	0	0	0	94
25 10 91	0	33	12	0	0	10	18	0	0	73
15 11 91	52	76	54	32	0	0	12	0	0	226
26 11 91	68	72	40	31	0	0	0	0	0	211
10 12 91	96	65	29	0	23	0	0	0	0	213
27 12 91	29	201	24	0	0	18	0	0	0	272
9 1 92	114	73	26	0	38	0	0	0	0	251
27 1 92	49	39	20	18	0	0	0	0	0	126
6 2 92	87	93	34	0	12	0	0	0	0	226
26 2 92	22	56	12	0	19	0	0	0	0	109
9 3 92	77	15	0	9	0	0	0	0	0	101
26 3 92	9	0	0	0	16	8	0	0	0	33
10 4 92	0	10	9	0	18	6	0	0	0	43
23 4 92	0	0	0	0	8	28	6	0	0	42

	1988/89	1989/90	1990/91	1991/92
Peak count	282	658	367	272
Mean of three highest counts	244	460	360	250

Wigeon were found between September and April (with one record of 10 in June 1991 outside this period), with highest numbers in early winter. Numbers were lower than in the two preceding winters but were similar to those in 1988/89. Wigeon were recorded mainly in the lower estuary (Mouth, Inches and Quay) and as far upstream as Snub. They were not recorded at Machar and Logie at the upstream of the estuary.

Teal *Anas crecca*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
26 2 92	0	0	0	0	0	0	0	0	18	18
9 3 92	0	0	0	0	0	0	0	0	21	21
26 3 92	0	0	0	0	0	0	0	0	25	25
10 4 92	0	0	0	0	0	0	0	0	28	28
23 4 92	0	0	0	0	0	0	0	0	19	19
20 5 92	0	0	0	0	0	0	0	0	12	12

Teal occurred only from February to May (but not in April and May 1991), with a peak of 28 on 10 April 1992 and a mean of 25 for the three highest counts. Teal were not recorded in 1988/89, 1989/90 or 1990/91, but may have been missed since they tended to retreat into cover on detecting the counter (who became aware of this and took special precautions in 1992). Teal were found only at Logie, at the upstream end of the estuary.

Mallard *Anas platyrhynchos*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
4 4 91	2	6	0	4	0	6	0	0	0	18
23 4 91	4	4	6	0	0	4	6	0	0	24
30 5 91	0	4	0	2	0	4	0	2	0	12
5 6 91	0	2	2	4	0	5	4	0	0	17
19 6 91	0	0	0	0	0	6	0	0	4	10
4 7 91	0	6	0	4	3	7	0	0	2	22
31 7 91	0	0	0	0	0	0	0	5	8	13
5 8 91	0	0	0	6	4	0	8	2	0	20
28 8 91	0	0	0	0	0	0	0	8	6	14
12 9 91	0	0	0	0	0	0	8	6	6	20
27 9 91	0	0	0	0	0	0	0	3	2	5
9 10 91	0	0	0	0	0	0	0	9	3	12
25 10 91	0	0	7	0	0	6	8	2	0	23
15 11 91	0	0	0	0	0	6	8	5	2	21
26 11 91	0	0	0	0	4	6	0	8	3	21
10 12 91	0	0	0	6	4	0	4	3	2	19
27 12 91	6	8	6	0	0	0	0	3	0	23
9 1 92	0	0	0	9	6	0	8	4	7	34
27 1 92	0	6	0	3	0	0	0	4	2	15
6 2 92	0	0	0	0	0	0	12	6	2	20
26 2 92	0	8	0	4	2	4	6	2	8	34
9 3 92	0	6	0	2	3	4	8	2	2	27
26 3 92	0	6	3	0	6	0	6	5	3	29
10 4 92	0	0	4	0	6	0	4	0	0	14
23 4 92	2	0	0	2	4	0	0	2	3	13
6 5 92	0	4	0	3	0	4	0	2	0	13
20 5 92	0	2	4	0	0	3	4	2	6	21

	1988/89	1989/90	1990/91	1991/92
Peak count	100	45	41	34
Mean of three highest counts	88	37	34	32

Mallard were found in low and variable numbers throughout the year, with no very obvious seasonal peak. The highest counts were a little lower than in the preceding two years, which in turn were considerably lower than those in 1988/89. Mallard occurred widely throughout the estuary, but most commonly in the upstream sections, Snub, Machar and Logie.

Scaup *Aythya marila*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
27 1 92	10	2	0	0	0	0	0	0	0	12
6 2 92	14	0	0	0	0	0	0	0	0	14
26 2 92	7	0	0	0	0	0	0	0	0	7
9 3 92	7	0	0	0	0	0	0	0	0	7

Scaup were found only from January to March, with a peak count of 14 on 6 February 1992 and a mean of 11 for the three highest counts. This species was not detected in the three previous winters. Scaup occurred only at the mouth of the estuary.

Long-tailed Duck *Clangula hyemalis*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
9 10 91	4	0	0	0	0	0	0	0	0	4
25 10 91	14	0	0	0	0	0	0	0	0	14
15 11 91	12	0	0	0	0	0	0	0	0	12
26 11 91	12	0	0	0	0	0	0	0	0	12
10 12 91	6	0	0	0	0	0	0	0	0	6
27 1 92	14	0	0	0	0	0	0	0	0	14
9 3 92	4	0	0	0	0	0	0	0	0	4
26 3 92	4	0	0	0	2	0	0	0	0	6

	1988/89	1989/90	1990/91	1991/92
Peak count	2	5	2	14
Mean of three highest counts	2	5	2	13

Long-tailed Ducks were recorded from October to March, with the highest numbers in autumn and in December, at a much higher level than the very low numbers of the three preceding years. Long-tailed Ducks were found only at the mouth of the estuary, apart from two seen in the Sleaf section on 26 March 1992.

Goldeneye *Bucephala clangula*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
15 11 91	0	0	0	0	0	16	0	0	0	16
26 11 91	3	2	3	3	0	0	0	0	0	11
10 12 91	4	6	2	0	3	0	0	0	0	15
27 12 91	8	10	3	0	0	4	0	0	0	25
9 1 92	0	3	2	0	4	0	0	0	0	9
27 1 92	6	0	0	0	0	2	0	0	0	8
6 2 92	10	4	4	4	0	0	0	0	0	22
26 2 92	4	0	0	0	0	0	0	0	0	4
9 3 92	4	0	0	0	4	2	0	0	0	10
26 3 92	3	2	0	0	2	4	0	0	0	11
10 4 92	4	0	3	0	4	2	0	0	0	13

	1988/89	1989/90	1990/91	1991/92
Peak count	33	41	31	25
Mean of three highest counts	31	36	27	21

Goldeneye occurred from November to April, with peaks in December and February, at a rather lower level than in the preceding years. Goldeneye were found mainly in the lower sections of the estuary (Mouth and Inches) and upstream as far as Haddo. None was recorded in the most upstream three sections, Snub to Logie.

Red-breasted Merganser *Mergus serrator*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
4 4 91	4	2	0	0	4	0	0	0	0	10
23 4 91	0	4	3	2	2	0	0	0	0	11
30 5 91	0	0	0	0	12	0	9	0	0	21
5 6 91	0	0	0	0	6	0	0	0	0	6
28 8 91	0	0	0	0	0	2	0	0	0	2
12 9 91	0	0	0	0	3	0	0	0	0	3
27 9 91	4	4	0	0	0	0	0	0	0	8
9 10 91	6	0	0	0	2	0	0	0	0	8
15 11 91	6	2	0	0	0	0	0	0	0	8
26 11 91	4	2	2	2	0	0	0	0	0	10
10 12 91	6	6	4	6	0	0	0	0	0	22
27 12 91	12	4	6	2	0	0	0	0	0	24
9 1 92	0	4	0	0	2	0	0	0	0	6
27 1 92	0	0	4	2	0	0	0	0	0	6
6 2 92	9	8	2	0	0	0	0	0	0	19
26 2 92	7	9	0	0	3	0	0	0	0	19
9 3 92	4	2	2	0	2	0	0	0	0	10
26 3 92	1	2	2	0	8	0	0	0	0	13
10 4 92	2	0	3	0	6	0	0	0	0	11
23 4 92	0	2	0	0	6	0	0	0	0	8

	1988/89	1989/90	1990/91	1991/92
Peak count	22	45	39	24
Mean of three highest counts	19	41	32	22

Mergansers were found in most months, although numbers were very low in autumn and in January. Peak numbers were lower than in the two preceding winters but were similar to those in 1988/89. Mergansers occurred mainly in the lower half of the estuary, from Mouth to Sleaford and none was recorded in the most upstream two sections, Machar and Logie.

Oystercatcher *Haematopus ostralegus*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT		
4	4	91	37	9	10	15	8	12	18	12	0	121
23	4	91	15	6	13	15	9	23	6	0	0	87
22	5	91	0	6	4	3	6	4	7	0	0	30
30	5	91	12	43	9	6	12	8	9	1	0	100
5	6	91	2	23	5	4	12	17	6	0	0	69
19	6	91	5	62	6	23	9	4	12	2	0	123
4	7	91	12	18	26	15	34	23	28	2	4	131
31	7	91	26	24	14	21	36	29	12	0	4	166
5	8	91	56	119	14	18	36	25	36	2	0	306
28	8	91	106	73	16	12	26	33	24	6	12	308
12	9	91	121	48	14	20	12	9	17	3	0	244
27	9	91	137	24	14	27	14	12	3	4	0	235
9	10	91	176	62	38	28	23	12	14	0	0	353
25	10	91	265	76	48	6	12	11	12	0	0	430
15	11	91	158	71	18	9	12	6	0	0	0	274
26	11	91	198	57	6	9	14	12	0	0	0	296
10	12	91	162	59	12	23	22	13	0	0	0	291
27	12	91	306	127	21	6	0	14	12	0	0	486
9	1	92	206	103	23	12	21	14	6	0	0	385
27	1	92	119	67	38	17	14	6	0	0	3	264
6	2	92	115	43	14	9	10	2	19	2	3	217
26	2	92	117	54	14	43	36	12	16	2	0	294
9	3	92	151	25	19	39	23	9	6	2	4	278
26	3	92	55	43	9	6	13	6	21	0	0	153
10	4	92	23	31	4	6	9	3	18	0	0	94
23	4	92	12	9	15	16	8	21	3	2	0	86
6	5	92	0	6	2	2	4	3	1	2	0	20
20	5	92	11	14	12	18	6	6	9	3	4	83

	1988/89	1989/90	1990/91	1991/92
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Peak count	310	478	445	486
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Mean of three highest counts	299	425	423	423
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Oystercatchers were present throughout the year, with highest numbers in autumn and winter. The highest counts were similar to those in the preceding two years but were higher than those in 1988/89. Oystercatchers were most abundant near the mouth of the estuary and were common as far upstream as Snub, but few were seen at Machar and Logie.

Ringed Plover *Charadrius hiaticula*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
23 4 91	0	0	0	0	0	3	0	0	0	3
22 5 91	0	0	0	0	0	0	178	0	0	178
30 5 91	0	0	0	0	0	0	117	0	0	117
5 6 91	0	0	0	0	0	51	0	0	0	51
9 10 91	0	8	0	6	9	12	0	0	0	35
10 12 91	0	0	0	0	0	10	6	0	0	16
27 1 92	0	6	0	0	0	0	12	0	0	18
26 2 92	0	0	0	0	0	10	0	0	0	10
9 3 92	0	0	0	0	0	15	0	0	0	15
23 4 92	0	0	0	0	0	8	3	0	0	11
6 5 92	0	0	0	0	12	36	0	0	0	48
20 5 92	0	0	0	0	0	0	6	0	0	6

	1988/89	1989/90	1990/91	1991/92
Peak count	29	60	40	178
Mean of three highest counts	25	31	34	115

Ringed Plovers were found in spring, autumn and winter, but not in summer (July to September), with peak numbers very much higher than those in any of the preceding three years. Ringed Plovers occurred mainly in the mid sections of the estuary, in Haddo and Snub.

Golden Plover *Pluvialis apricaria*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
19 6 91	0	0	0	0	0	0	1	0	0	1
31 7 91	0	62	0	0	18	0	18	0	0	98
5 8 91	0	6	0	0	159	20	0	0	0	185
28 8 91	72	0	0	0	0	210	0	0	0	282
27 9 91	0	0	0	0	0	0	15	0	0	15
9 10 91	103	0	0	0	0	0	0	0	0	103
25 10 91	14	0	73	0	0	433	0	0	0	520
15 11 91	24	125	0	0	0	0	0	0	0	149
26 11 91	0	0	0	0	0	709	0	0	0	709
27 12 91	36	74	0	0	0	0	0	0	0	110
9 1 92	0	850	0	0	0	0	0	0	0	850
27 1 92	12	0	0	0	0	0	0	0	0	12
6 2 92	38	0	0	0	0	296	0	0	0	334

	1988/89	1989/90	1990/91	1991/92
Peak count	634	156	193	850
Mean of three highest counts	451	141	141	693

Golden Plovers were found in summer, autumn and early winter, with peak counts higher than in the three preceding years. Numbers were highly variable from count to count, probably reflecting the incidence of hard weather, when the birds moved from fields to the estuary. Golden Plovers occurred mainly at Mouth and Inches and at Sleek and Haddo, with few seen elsewhere.

Lapwing		Vanellus vanellus									
DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT	
4	4	91	3	4	0	6	0	4	0	0	17
23	4	91	3	0	0	4	0	9	16	2	34
22	5	91	0	2	0	0	6	2	2	0	12
30	5	91	0	0	0	0	0	6	9	0	15
5	6	91	0	0	0	0	9	16	4	2	37
4	7	91	0	12	18	0	15	26	21	0	98
31	7	91	0	6	12	21	26	37	32	0	137
5	8	91	0	12	6	24	36	19	37	0	137
28	8	91	3	0	9	6	12	29	7	3	69
12	9	91	0	0	0	0	0	22	36	3	67
27	9	91	0	0	43	66	33	214	37	6	400
9	10	91	0	0	6	0	9	12	17	3	51
25	10	91	0	45	114	14	115	510	160	43	1013
15	11	91	3	0	24	21	32	42	0	3	125
26	11	91	0	139	394	26	68	205	75	24	941
10	12	91	0	0	22	29	19	0	0	0	76
27	12	91	30	12	27	17	6	0	0	0	92
9	1	92	0	0	103	0	150	0	0	47	300
27	1	92	0	0	0	0	0	0	0	6	6
6	2	92	0	23	130	86	170	570	33	23	1041
26	2	92	0	0	0	0	0	149	65	18	238
9	3	92	0	0	0	0	0	63	0	6	81
10	4	92	0	0	12	0	9	0	0	0	21
23	4	92	0	4	0	6	0	12	9	3	35
6	5	92	0	2	0	0	4	0	3	0	10
20	5	92	0	0	0	0	0	0	0	0	4
					1988/89	1989/90	1990/91	1991/92			
Peak count					930	1925	645	1041			
Mean of three highest counts					693	1286	553	998			

Lapwings occurred throughout the year, with highest numbers in winter, at levels higher than in 1988/89 and 1990/91 but lower than in 1989/90. Numbers varied greatly between counts, probably (as with Golden Plover) as a result of hard weather inland. Numbers in spring varied from 4 - 35. Lapwings were found throughout the estuary, although numbers were low at the mouth and at Machar and Logie.

Knot *Calidrus canutus*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
28 8 91	24	0	0	0	0	0	0	0	0	24
27 9 91	29	0	0	0	0	0	0	0	0	29
26 11 91	103	0	0	0	0	0	0	0	0	103
10 12 91	129	0	0	0	0	0	0	0	0	129
27 1 92	21	0	0	0	0	0	0	0	0	21
6 2 92	139	0	0	0	0	0	0	0	0	139

	1988/89	1989/90	1990/91	1991/92
Peak count	103	36	55	139
Mean of three highest counts	82	34	43	124

Knot were seen only in autumn and winter, with peak counts the highest for the four-year period. Knot occurred only at the mouth of the estuary.

Dunlin *Calidris alpina*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
4 4 91	0	15	0	0	0	36	0	0	0	51
23 4 91	0	0	0	0	0	20	0	0	0	20
22 5 91	0	0	0	0	0	0	216	0	0	216
30 5 91	14	0	0	0	15	0	67	6	0	102
5 6 91	0	0	0	0	0	31	0	0	0	31
31 7 91	0	0	0	0	0	0	46	0	0	46
5 8 91	0	0	14	0	63	14	29	0	0	120
28 8 91	42	18	0	0	12	28	23	0	0	123
12 9 91	233	19	0	0	20	0	49	0	0	321
27 9 91	120	0	23	12	0	0	49	0	0	204
9 10 91	44	32	14	12	14	0	210	0	0	326
25 10 91	279	14	12	0	0	0	178	0	0	483
15 11 91	156	36	12	0	22	39	0	0	0	265
26 11 91	167	0	0	0	9	0	156	0	0	332
10 12 91	37	12	0	0	0	18	125	0	0	192
27 12 91	54	201	30	39	0	15	23	0	0	362
9 1 92	33	0	19	24	0	29	47	0	0	152
27 1 92	73	21	24	22	0	12	77	0	0	229
6 2 92	62	36	0	0	14	36	46	0	0	194
26 2 92	83	47	39	0	21	64	29	0	0	283
9 3 92	0	0	0	0	0	24	18	12	0	54
26 3 92	77	0	0	0	0	0	34	0	0	111
10 4 92	33	12	0	0	21	0	42	0	0	108
23 4 92	12	0	0	0	0	9	12	0	0	33
6 5 92	0	0	0	0	0	136	0	0	0	136
20 5 92	0	0	136	24	0	0	0	0	0	160

	1988/89	1989/90	1990/91	1991/92
Peak count	421	513	382	483
Mean of three highest counts	371	429	344	390

Dunlin occurred throughout the year, with peak totals in autumn at broadly similar levels to those in the preceding three years. Dunlin were found over most of the estuary except for Machar and Logie, with particularly high numbers at the mouth and at Snub.

Black-tailed Godwit *Limosa limosa*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
25 10 91	0	36	0	0	0	0	0	0	0	36
15 11 91	0	4	0	0	0	0	0	0	0	4
10 12 91	0	0	0	4	0	0	0	0	0	4

A flock of 36 Black-tailed Godwits were seen at Inches on 25 October, four on 15 November and four on 10 December 1991, but none were seen elsewhere or on any other count. None had been detected in the three preceding years.

Bar-tailed Godwit *Limosa lapponica*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
5 6 91	0	0	6	0	15	0	0	0	0	21
31 7 91	0	0	0	0	0	0	9	0	0	9
12 9 91	0	22	0	4	2	0	4	0	0	32
27 9 91	6	19	9	2	4	9	7	0	0	56
9 10 91	0	53	0	0	4	2	0	0	0	59
25 10 91	2	0	6	2	0	0	8	0	0	18
15 11 91	3	16	0	0	0	0	0	0	0	19
26 11 91	9	12	0	0	2	0	0	0	0	23
10 12 91	6	16	4	6	4	2	0	0	0	38
27 12 91	10	18	0	16	0	4	3	0	0	51
9 1 92	4	15	4	0	0	0	0	0	0	23
27 1 92	9	6	3	2	0	0	0	0	0	20
6 2 92	8	9	3	0	0	6	0	0	0	26
26 2 92	3	0	3	7	4	9	6	2	0	34
9 3 92	4	2	2	6	0	4	1	0	0	19
26 3 92	6	3	1	2	14	7	6	0	0	39
10 4 92	2	0	3	0	6	0	2	0	0	13
23 4 92	0	0	0	2	0	0	0	0	0	2
6 5 92	0	0	0	2	0	0	0	0	0	2
20 5 92	0	0	2	4	0	0	5	0	0	11
			1988/89	1989/90	1990/91	1991/92				
Peak count			39	56	89	59				
Mean of three highest counts			28	47	72	55				

Bar-tailed Godwits were found throughout the year, with highest counts in autumn. Numbers were lower than in the previous year but were similar to those in 1989/90. Bar-tailed Godwits occurred throughout the estuary, although few were found at Machar and Logie.

Curlew *Numenius arquata*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
4 4 91	6	7	2	0	1	3	4	1	0	24
23 4 91	2	2	0	0	0	0	82	0	0	86
22 5 91	0	1	2	7	3	2	4	0	0	19
30 5 91	1	4	14	8	10	28	12	2	0	79
5 6 91	0	6	0	3	21	0	0	2	0	32
19 6 91	0	0	0	2	4	2	12	1	0	21
4 7 91	1	14	9	11	14	9	8	1	0	67
31 7 91	2	19	6	9	24	28	23	3	0	114
5 8 91	0	34	12	10	19	26	33	0	2	136
28 8 91	9	14	12	6	9	24	18	3	2	97
12 9 91	9	49	3	3	11	18	24	1	0	118
27 9 91	6	47	6	18	9	15	23	2	0	126
9 10 91	16	38	12	14	18	29	21	0	1	149
25 10 91	12	23	19	12	6	8	19	6	1	106
15 11 91	23	21	6	16	7	12	9	2	0	96
26 11 91	25	36	3	23	11	28	19	0	2	147
10 12 91	6	21	6	12	14	14	12	1	0	86
27 12 91	14	39	8	18	8	39	11	2	0	139
9 1 92	6	24	6	19	24	11	19	1	1	111
27 1 92	12	49	19	9	12	14	6	2	0	123
6 2 92	9	49	6	3	9	12	9	3	1	101
26 2 92	6	39	9	6	17	21	23	4	1	126
9 3 92	6	12	4	6	12	6	14	3	1	64
26 3 92	6	15	2	3	2	6	14	2	1	51
10 4 92	9	21	5	4	2	9	12	2	2	66
23 4 92	4	6	0	0	3	4	35	1	0	53
6 5 92	2	12	2	4	1	1	2	0	0	24
20 5 92	0	3	6	3	2	6	6	1	2	29

	1988/89	1989/90	1990/91	1991/92
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Peak count	176	1017	200	147
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Mean of three highest counts	166	574	176	144
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Curlew were found throughout the year, with highest counts in late summer and autumn. Numbers were lower than in the three preceding years. Curlew occurred in all sections of the estuary, with lowest numbers at Machar and Logie.

Redshank *Tringa totanus*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT		
4	4	91	28	12	14	73	29	81	75	4	0	316
23	4	91	10	12	9	33	27	19	137	0	0	247
22	5	91	0	3	10	0	15	0	19	0	0	47
30	5	91	4	3	0	12	10	6	6	2	0	43
5	6	91	0	0	0	6	9	2	4	0	0	21
19	6	91	0	0	0	6	4	3	0	0	0	13
4	7	91	4	6	12	12	18	10	22	0	2	86
31	7	91	9	10	12	18	48	59	37	2	5	200
5	8	91	0	36	23	48	69	47	115	6	1	345
28	8	91	12	14	42	24	29	37	160	8	4	330
12	9	91	65	53	21	49	28	21	39	4	2	282
27	9	91	83	36	29	39	36	31	137	0	2	393
9	10	91	120	57	73	64	56	63	62	6	3	504
25	10	91	46	43	39	93	23	60	220	26	1	551
15	11	91	54	64	23	29	23	52	29	6	1	281
26	11	91	63	29	14	73	27	69	57	6	1	339
10	12	91	45	53	24	69	37	12	47	2	0	289
27	12	91	42	50	21	63	60	23	48	6	0	313
9	1	92	19	38	11	65	36	19	63	12	3	266
27	1	92	63	43	29	63	29	23	49	6	2	307
6	2	92	32	18	12	21	12	21	63	12	6	197
26	2	92	29	39	27	59	44	73	96	12	2	381
9	3	92	34	23	36	64	59	49	53	9	3	330
26	3	92	17	14	12	27	29	46	153	17	6	321
10	4	92	15	9	12	33	37	54	83	19	2	264
23	4	92	6	14	12	42	25	22	108	0	0	229
6	5	92	12	6	12	23	25	6	14	0	0	98
20	5	92	10	6	21	29	14	10	23	6	2	121

	1988/89	1989/90	1990/91	1991/92
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Peak count	925	516	510	551
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Mean of three highest counts	655	471	482	483
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Redshanks occurred throughout the year, with highest numbers in autumn, at a similar level to that in the preceding two years although lower than the peak counts in 1988/89. Redshanks occurred throughout the estuary, with lowest numbers at Machar and Logie.

Greenshank *Tringa nebularius*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
28 8 91	0	0	0	0	6	0	0	0	0	6

A group of six Greenshanks, were found on Sleek on 28 August 1991, but none were detected in any other counts.

Turnstone *Arenaria interpres*

DATE	MO	IN	QU	TA	SL	HA	SN	MA	LO	TOT
4 4 91	6	4	0	0	0	6	0	0	0	16
23 4 91	5	3	0	0	0	3	4	0	0	15
22 5 91	0	0	2	0	0	0	0	0	0	2
4 7 91	0	0	2	1	6	2	0	0	0	11
31 7 91	0	0	3	6	12	6	2	0	0	29
5 8 91	7	2	9	6	14	6	12	0	0	56
28 8 91	9	6	2	3	6	6	12	0	0	44
12 9 91	12	18	9	6	9	6	17	0	0	77
27 9 91	37	14	6	3	6	14	6	0	0	86
9 10 91	26	18	12	9	12	6	6	0	0	89
25 10 91	18	6	6	3	18	3	16	2	0	72
15 11 91	29	18	3	6	9	6	3	0	0	74
26 11 91	23	9	6	6	14	6	14	0	0	78
10 12 91	14	9	3	6	2	2	6	0	0	42
27 12 91	14	37	12	9	16	0	5	0	0	93
9 1 92	9	21	4	0	9	14	21	0	0	78
27 1 92	23	19	6	6	3	3	9	0	0	69
6 2 92	27	9	6	0	12	14	12	0	0	80
26 2 92	24	12	14	2	14	12	4	0	0	82
9 3 92	9	6	10	12	2	6	9	0	0	54
26 3 92	17	2	2	4	12	6	0	0	0	43
10 4 92	12	6	2	0	15	9	0	0	0	44
23 4 92	12	6	0	0	0	7	11	0	0	36
6 5 92	0	6	5	0	0	12	9	0	0	32
20 5 92	0	0	6	7	3	9	12	0	0	37

	1988/89	1989/90	1990/91	1991/92
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Peak count	101	175	124	93
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Mean of three highest counts	85	164	116	89
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Turnstones were found in all months except June 1991, with highest totals in autumn and winter. Numbers were lower than in the preceding three years. Turnstones were not seen on two most upstream sections of the estuary (except for two birds at Machar on 25 October 1991), but occurred widely elsewhere.

## TOTAL NUMBER OF BIRDS ON THE ESTUARY

The total number of birds of all species was calculated for each count and the mean taken for each month. Eiders, as the single most numerous species, were considered separately.

Month	Eiders	Other Species	Total
<b>1991</b>			
April	2,674	621	3,295
May	3,949	532	4,481
June	3,587	262	3,849
July	974	614	1,588
August	338	1,304	1,642
September	742*	1,410	2,152
October	1,146	2,563	3,709
November	1,062	2,403	3,465
December	1,063	1,716	2,779
<b>1992</b>			
January	871	1,860	2,731
February	835	2,172	3,007
March	762	999	1,761
April	3,168	683	3,851
May	2,461	489	2,950

\* intrapolated, since no count was made

The total showed a very clear seasonal pattern, with two peaks in the total; one from April to June due almost entirely to a peak in Eider numbers and one in October and November, mainly of species other Eiders (Fig. 2). There was a minimum in total numbers from July to September, when Eiders had gone to moult and before the autumn influx of other species, and another in March, when the latter peak had passed before the Eiders returned.

**TOTAL NUMBER AND DENSITY OF BIRDS IN  
DIFFERENT PARTS OF THE ESTUARY**

The relative importance of the different parts of the estuary for waders and waterfowl was assessed by adding for each count area the various species' totals at the time of year when numbers were highest, ie May for Eiders and October/November for the other species (see previous section).

Part of Estuary	Area (ha)	Mean Number per Count:			
		Eiders		Other Species	
		Mean	Per Ha	Mean	Per Ha
Mouth	27.5	1579	57.4	590	21.5
Inches	45.1	1947	43.2	334	7.4
Quay	25.8	290	11.2	275	10.7
Tarty	8.5	0	0.0	137	16.1
Sleek	77.9	127	1.6	163	2.1
Snub + Haddo	49.2	6	0.1	963	19.6
Machar	9.2	0	0.0	38	4.1
Logie	3.3	0	0.0	11	3.3
<b>Total</b>	<b>246.4</b>	<b>3949</b>	<b>16.0</b>	<b>2511</b>	<b>10.2</b>

The Mouth and Inches sections were the most important for Eiders, in terms of both total numbers and density per ha, with few found elsewhere. It must be emphasised that the birds were roosting at the time of the counts, but most Eider feeding occurred in the same two sections.

The highest numbers and densities of other species were found at the Mouth and in the Snub/Haddo section (combined to include both banks of the estuary, as in the other sections). In contrast, the Sleek had a very low bird density and thus a low total in relation to its large size. Among the smaller sections, the Tarty area had a high density but the upstream sections of Logie and Machar had both low numbers and densities.

#### COMPARISONS BETWEEN YEARS

##### a) Total number of birds

Within 1991/92, April and May were counted in both years, allowing a direct comparison. Eider numbers were slightly lower in 1992 than in 1991 (March-April mean 2,815 compared to 3,312), although the peak breeding population of the whole area, including the sea coast was very similar in the two years (1992, 5,059; 1991, 5,048; Patterson & Laing 1991, 1992; unpublished reports to SNH). The total number of birds other

than Eiders was very slightly higher in 1992 than in 1991 (March-April mean 586 compared to 577).

In comparison to the two previous years, the total of birds other than Eiders during the October/November peak was higher in 1991 (2,563 and 2,403) compared to 1,979 and 2,095 in 1989 and 1,387 and 1,179 in 1989 (when, however, there were 1,941 and 2,074 in December and January 1991 respectively). There were no counts in autumn 1998, but 2,030 birds were counted in December.

b) Individual species

The number of each common species in 1991/92 was compared with that in the preceding years by taking the mean of the highest three counts in 1991/92 (shown in the species tables) in relation to the average of the mean values in 1988/89, 1989/90 and 1990/91, also shown in the tables.

Of six duck species where comparison was possible, only the Shelduck and the Long-tailed Duck showed an increase in 1991/92 while Wigeon, Mallard, Goldeneye and Red-breasted Merganser all showed a decrease, most to about two-thirds of the preceding three-year average.

In contrast, most waders showed an increase in 1991/92, substantial in some cases (eg Ringed Plover and Knot). Only the Curlew (down to about half of the previous average) and Redshank (down only slightly) showed decreases.

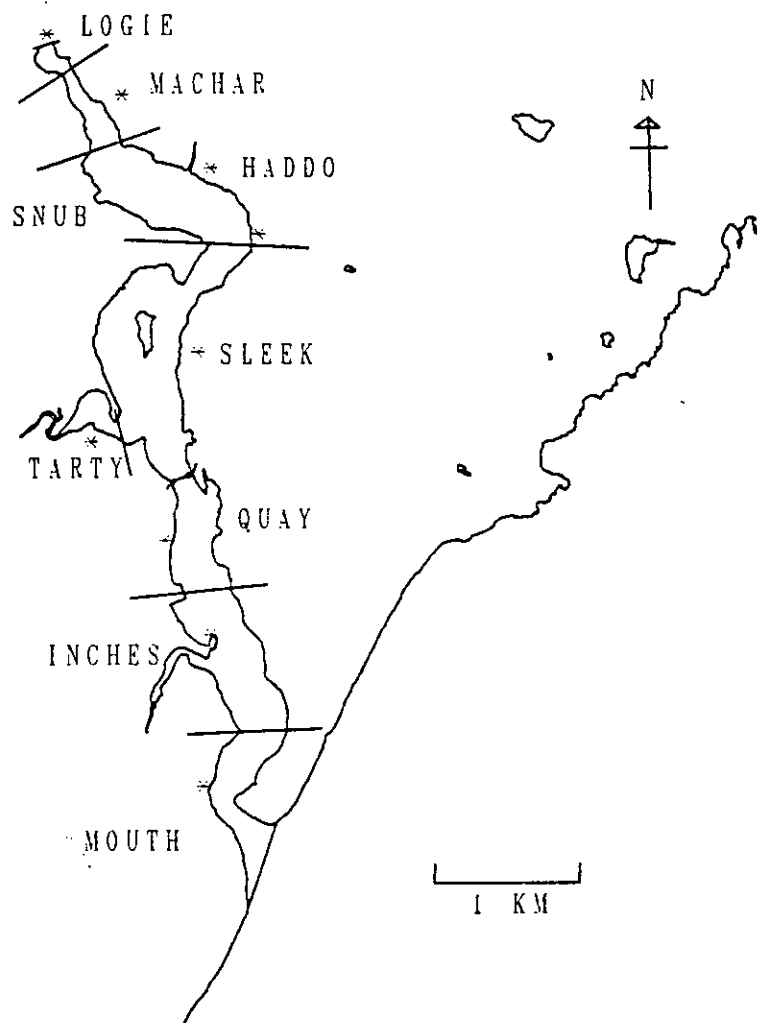


Figure 1. The Ythan estuary, showing the counting sections and count points (asterisks). The division between the Snub and Haddo areas is the centre of the low-tide river channel.

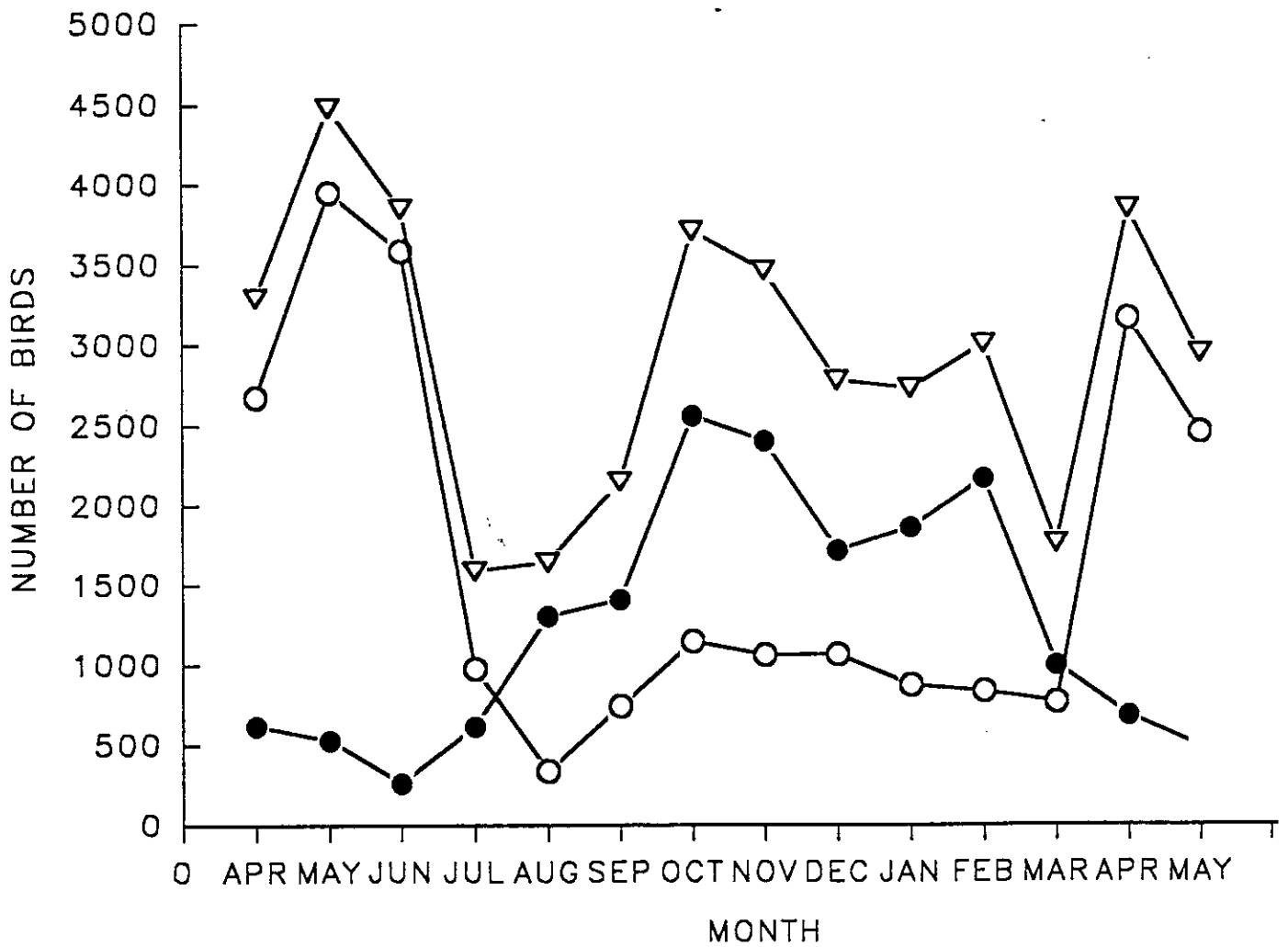


Figure 2. Seasonal variations in the total number of birds counted on the Ythan estuary in 1991/92 (inverted triangles), in the number of Eiders (solid circles) and in other species (open circles). Each data point is the mean of two counts.

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**Dualchas Nàdair na h-Alba**

All of nature for all of Scotland  
Nàdar air fad airson Alba air fad