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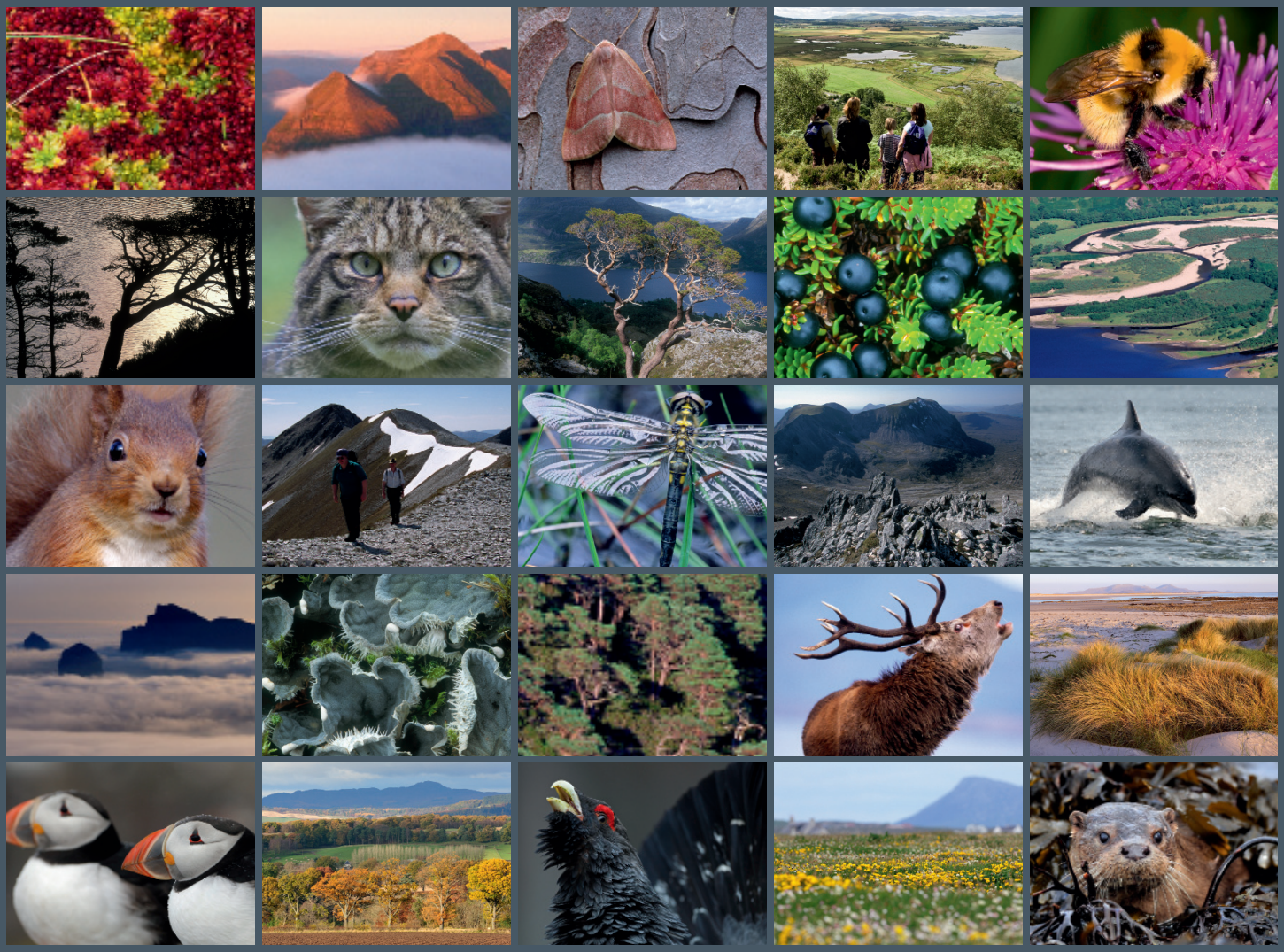
Waders and wildfowl on the Ythan Estuary 2002/2003



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ARCHIVE REPORT

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Waders and wildfowl on the Ythan Estuary 2002/2003

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ARCHIVE REPORT

Summary

Waders and wildfowl on the Ythan Estuary 2002/2003

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Background

Counts of waders and wildfowl on the Ythan estuary were made from 10 July 2002 to 26 June 2003, using similar methods to those used in the past, to enable the data to be comparable; a systematic survey from the estuary mouth to Logie Buchan bridge (Appendix 1). Fortnightly counts and the distribution of birds over the estuary are shown in detail for each species.

Main findings

- The highest monthly mean count of Eiders in spring increased from 3,216 in 2001/02 to 3,361 in 2002/03, while the peak monthly mean total of other species (in September) also increased, from 10,121 to 11,266.
- The overall mean total of birds other than Eiders over the whole autumn and winter (August to February) increased from 5,626 in 2001/02 to 6,036 in 2002/03, a similar value to that in 2000/01 (6,159).
- There was no consistent evidence of a change in the numbers of wildfowl between 2001/02 and 2002/03, with peak counts showing mainly decreases but median counts showing increases. Most wader species, however, showed increases in both their peak and median counts.
- A number of species less commonly seen on the Ythan were again recorded systematically in 2002/03; their occurrence and numbers are tabulated.

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1. INTRODUCTION

The wader and wildfowl counts in this report can be compared with data collected since 1989/90, and had 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 10 July 2002 to 26 June 2003, using the same methods as in previous years (Appendix 1). Since the field surveys in 2002/03 were again carried out by a specialist ornithologist, it was possible to include counts of species which occur less commonly on the Ythan.

2. RESULTS

2.1 Individual species which occur commonly on the Ythan

As in the previous report to the Ythan Project, the data are presented in separate species accounts, arranged in taxonomic order. 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 Figure 1, and the total on the whole estuary, on each count date. Information which is not obvious from the data tables is appended 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 2.4.

CORMORANT *Phalacrocorax carbo*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10 7 2002	0	1	5	0	8	6	1	0	0	21
21 7 2002	5	6	3	0	3	0	9	0	0	26
8 8 2002	2	0	2	0	19	0	6	0	0	29
26 8 2002	0	0	1	0	22	6	11	0	0	40
9 9 2002	2	6	3	0	37	0	0	0	0	48
25 9 2002	4	6	1	26	0	0	1	0	0	38
18 10 2002	3	5	7	0	4	0	0	5	0	24
29 10 2002	3	1	3	0	10	0	0	0	0	17
8 11 2002	4	0	2	0	9	10	0	2	1	28
29 11 2002	2	2	2	0	7	0	0	0	0	13
9 12 2002	2	2	0	0	8	3	0	0	0	15
27 12 2002	2	1	2	0	3	3	0	1	0	12
9 1 2003	0	0	2	0	4	0	0	0	0	6
23 1 2003	0	1	1	0	5	1	1	0	0	9
5 2 2003	2	3	1	0	0	0	0	0	0	6
20 2 2003	0	0	4	0	1	0	0	0	0	5
3 3 2003	0	1	0	0	2	0	2	0	0	5
19 3 2003	0	2	0	0	3	0	2	0	0	7
4 4 2003	1	2	2	0	1	0	1	0	0	7
25 4 2003	1	2	0	0	1	0	2	0	0	6
6 5 2003	0	4	2	0	26	0	0	0	0	32
27 5 2003	0	0	0	0	2	0	0	0	0	2
11 6 2003	0	3	1	0	11	0	0	0	0	15
26 6 2003	0	0	0	0	0	0	5	0	0	5

Peak; 48: (2001/2002 peak; 60)

HERON *Ardea cinerea*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10 7 2002	1	0	5	4	2	0	4	0	0	16
21 7 2002	5	7	5	1	6	0	3	0	0	27
8 8 2002	1	11	7	21	7	0	2	1	0	50
26 8 2002	1	6	5	11	8	1	5	0	0	37
9 9 2002	1	12	1	6	14	4	4	0	0	42
25 9 2002	0	0	1	0	18	0	10	0	1	30
18 10 2002	3	3	0	1	3	0	0	1	1	12
29 10 2002	1	3	4	2	6	0	0	0	0	16
8 11 2002	3	6	2	1	2	3	3	0	0	20
29 11 2002	0	3	0	1	2	1	0	1	0	8
9 12 2002	0	0	0	0	1	0	0	0	1	2
27 12 2002	1	4	1	0	2	1	0	0	0	9
9 1 2003	1	2	0	0	2	0	0	0	0	5
23 1 2003	2	4	2	0	4	1	0	1	1	15
5 2 2003	0	2	0	0	0	0	0	0	1	3
20 2 2003	0	2	0	0	2	0	0	0	0	4
3 3 2003	0	2	3	0	2	0	0	0	0	7
19 3 2003	0	1	3	0	3	0	0	0	0	7
4 4 2003	0	2	2	0	0	0	0	0	0	4
25 4 2003	0	1	0	0	1	0	0	1	0	3
6 5 2003	0	1	1	0	2	1	1	0	1	7
27 5 2003	1	1	1	0	3	1	0	0	0	7
11 6 2003	0	4	0	0	9	1	1	0	0	15
26 6 2003	0	2	1	0	4	0	0	0	0	7

Peak; 50: (2001/2002 peak; 57)

MUTE SWAN *Cygnus olor*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10 7 2002	0	0	2	0	6	0	2	0	2	12
21 7 2002	0	0	2	0	0	0	7	0	0	9
8 8 2002	0	0	0	0	0	0	2	0	0	2
26 8 2002	0	0	0	0	5	1	0	0	0	6
9 9 2002	0	0	0	0	2	2	1	0	0	5
25 9 2002	0	0	0	0	1	0	2	0	5	8
18 10 2002	0	5	0	0	1	0	0	0	0	6
29 10 2002	0	2	2	2	6	8	0	0	0	20
8 11 2002	0	10	2	0	1	18	0	0	0	31
29 11 2002	0	2	0	2	8	16	0	0	0	28
9 12 2002	0	4	0	1	5	0	0	0	0	10
27 12 2002	0	3	0	0	3	16	0	0	0	22
9 1 2003	1	0	0	0	4	0	0	0	0	5
23 1 2003	0	0	0	1	1	0	0	0	0	2
5 2 2003	0	0	0	0	3	22	0	0	0	25
20 2 2003	0	0	0	0	8	0	0	0	0	8
3 3 2003	0	0	0	0	6	1	0	0	0	7
19 3 2003	0	0	0	0	3	3	0	0	0	6
4 4 2003	2	1	0	0	2	0	0	0	0	5
25 4 2003	0	1	0	0	1	2	0	0	0	4
6 5 2003	0	1	0	0	1	23	9	0	0	34
27 5 2003	0	0	6	0	27	14	0	2	0	49
11 6 2003	0	0	0	0	5	0	0	0	0	5
26 6 2003	0	0	0	0	15	8	0	0	0	23

Peak; 49: (2001/2002 peak; 35)

SHELDUCK *Tadorna tadorna*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10 7 2002	0	0	4	4	73	6	12	0	0	99
21 7 2002	0	1	0	3	16	4	0	0	0	24
8 8 2002	0	2	0	6	34	0	3	0	0	45
26 8 2002	0	1	0	4	17	6	0	0	0	28
9 9 2002	0	1	0	2	12	1	0	0	0	16
18 10 2002	0	1	0	0	8	3	0	0	0	12
29 10 2002	0	0	0	0	1	7	0	0	0	8
8 11 2002	0	0	0	0	2	3	0	0	0	5
29 11 2002	0	0	0	0	0	41	0	0	0	41
9 12 2002	0	1	0	0	7	32	0	0	0	40
27 12 2002	0	0	0	0	4	51	0	0	0	55
9 1 2003	0	2	0	0	44	0	0	0	0	46
23 1 2003	0	3	2	2	49	14	0	0	0	70
5 2 2003	0	2	6	2	83	0	0	0	0	93
20 2 2003	2	10	3	0	91	15	4	0	0	125
3 3 2003	0	8	7	0	94	13	3	0	0	125
19 3 2003	0	13	3	5	49	40	2	0	0	112
4 4 2003	2	6	3	8	38	20	7	4	0	88
25 4 2003	0	7	2	6	73	32	6	12	55	193
6 5 2003	1	4	7	8	68	75	6	6	2	177
27 5 2003	0	2	2	3	60	45	6	2	2	122
11 6 2003	0	2	12	21	71	76	24	0	1	207
26 6 2003	0	1	5	8	65	53	5	0	1	138

Peak; 207: (2001/2002 peak; 146)

EIDER *Somateria mollissima*

Date			Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
12	7	2002	1465	74	77	0	4	5	0	0	0	1625
18	7	2002	789	84	51	0	4	0	0	0	0	928
8	8	2002	901	20	0	0	0	0	0	0	0	921
21	8	2002	599	16	1	0	0	0	0	0	0	616
9	9	2002	807	0	2	0	0	0	0	0	0	809
26	9	2002	1548	26	38	0	12	0	0	0	0	1624
27	9	2002	2121	7	4	0	0	0	0	0	0	2132
16	10	2002	253	480	933	0	0	0	0	0	0	1666
30	10	2002	500	391	48	0	0	0	0	0	0	939
8	11	2002	21	343	534	0	0	0	0	0	0	898
29	11	2002	807	0	2	0	0	0	0	0	0	809
17	12	2002	12	37	991	0	22	0	0	0	0	1062
31	12	2002	181	821	43	0	21	0	0	0	0	1066
14	1	2003	225	405	3	0	5	0	0	0	0	638
28	1	2003	52	329	226	0	14	0	0	0	0	621
13	2	2003	85	75	165	0	20	0	0	0	0	345
14	2	2003	44	28	483	0	51	0	0	0	0	606
27	2	2003	62	72	278	0	89	0	0	0	0	501
27	3	2003	163	217	33	0	6	0	0	0	0	419
14	4	2003	2538	405	327	0	26	0	0	0	0	3296
24	4	2003	1172	1862	256	0	80	0	0	0	0	3370
29	4	2003	1661	1104	561	0	92	0	0	0	0	3418
6	5	2003	2148	1243	282	0	66	0	0	0	0	3739
14	5	2003	903	727	439	0	68	0	0	0	0	2137
20	5	2003	802	605	123	0	52	0	0	0	0	1582
3	6	2003	2193	322	62	0	16	0	0	0	0	2593
23	6	2003	2147	152	74	0	14	0	0	0	0	2387

Peak; 3,739: (2001/2002 peak; 3,413)

The total number of ducklings reared in 2003 was 222, including 23 on the sea coast between Collieston and the mouth of the estuary.

WIGEON *Anas penelope*

Date			Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10	7	2002	0	0	0	0	0	0	15	0	0	15
8	8	2002	0	0	0	0	0	1	0	0	0	1
26	8	2002	0	0	0	0	0	0	8	0	0	8
9	9	2002	10	0	0	0	47	0	0	0	0	57
25	9	2002	0	0	0	172	0	0	25	0	0	197
18	10	2002	101	130	17	0	0	0	0	0	0	248
29	10	2002	305	10	79	0	0	0	0	0	0	394
8	11	2002	324	35	52	0	76	0	0	0	0	487
29	11	2002	636	108	100	0	190	0	0	0	0	1034
9	12	2002	410	84	160	0	8	0	0	0	0	662
27	12	2002	144	90	225	0	0	0	0	0	0	459
9	1	2003	119	204	650	0	0	0	0	0	0	973
23	1	2003	470	41	230	0	0	0	0	0	0	741
5	2	2003	146	87	210	0	470	0	0	0	0	913
20	2	2003	59	47	330	0	50	0	0	0	0	486
3	3	2003	51	81	35	0	169	0	40	0	0	376
19	3	2003	11	49	0	0	134	0	0	0	0	194
4	4	2003	0	7	0	0	71	0	0	0	0	78
25	4	2003	0	1	0	0	0	0	0	9	0	10
27	5	2003	0	0	1	0	0	2	0	0	0	3
11	6	2003	0	0	0	0	0	3	6	0	0	9
26	6	2003	0	0	0	0	0	0	8	0	0	8

Peak; 1,034: (2001/2002 peak; 709)

TEAL *Anas crecca*

Date			Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
8	8	2002	0	0	0	0	1	0	0	0	0	1
26	8	2002	0	0	0	0	5	0	0	0	6	11
9	9	2002	0	2	0	0	0	0	0	0	0	2
8	11	2002	0	0	0	0	1	0	0	0	0	1
20	2	2003	0	0	0	0	0	0	0	0	13	13
3	3	2003	0	0	0	0	0	0	0	0	6	6
19	3	2003	0	0	0	0	0	0	10	0	11	21
4	4	2003	0	0	0	0	0	0	0	2	0	2
25	4	2003	0	0	0	0	0	0	0	0	8	8

Peak; 21: (2001/2002 peak; 29)

MALLARD *Anas platyrhynchos*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10 7 2002	0	0	0	0	0	0	4	0	2	6
21 7 2002	0	4	0	0	0	0	6	0	0	10
8 8 2002	0	1	0	0	4	0	8	0	0	13
26 8 2002	0	0	0	0	0	3	1	0	2	6
9 9 2002	0	0	0	0	0	1	8	0	0	9
29 10 2002	0	0	0	0	0	1	0	0	0	1
9 12 2002	0	2	0	0	0	0	0	0	0	2
27 12 2002	0	11	2	0	0	13	0	0	0	26
9 1 2003	0	19	0	0	3	0	2	0	0	24
5 2 2003	0	4	0	0	4	0	0	0	0	8
3 3 2003	0	1	2	0	12	0	0	0	0	15
19 3 2003	0	2	2	0	8	0	0	0	0	12
4 4 2003	0	3	0	0	11	0	2	3	0	19
25 4 2003	0	4	1	0	4	2	1	2	0	14
6 5 2003	1	2	0	0	5	16	0	0	3	27
27 5 2003	0	1	0	1	2	19	5	0	1	29
11 6 2003	0	2	0	2	1	37	0	0	1	43
26 6 2003	0	6	0	3	10	2	21	3	0	45

Peak; 45: (2001/2002 peak; 39)

GOLDENEYE *Bucephala clangula*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
18 10 2002	2	0	0	0	0	0	0	0	0	2
29 10 2002	0	1	3	0	9	0	0	0	0	13
8 11 2002	1	2	6	0	25	0	2	2	0	38
29 11 2002	15	0	17	0	5	0	0	0	0	37
9 12 2002	9	4	5	0	3	0	0	5	0	26
27 12 2002	16	8	4	0	1	1	0	1	0	31
9 1 2003	6	11	5	0	8	0	0	1	0	31
23 1 2003	12	0	3	0	0	0	0	1	0	16
5 2 2003	4	4	8	0	1	1	0	1	0	19
20 2 2003	0	8	4	0	1	0	0	0	0	13
3 3 2003	1	3	4	0	9	0	3	1	0	21
19 3 2003	2	2	1	0	12	0	0	0	6	23
4 4 2003	0	0	1	0	10	2	7	2	0	22
25 4 2003	0	2	2	0	7	0	0	0	0	11
6 5 2003	0	0	3	0	4	0	0	0	0	7
11 6 2003	0	0	0	0	0	2	0	0	0	2

Peak; 38: (2001/2002 peak; 25)

RED-BREASTED MERGANSER *Mergus serrator*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
21 7 2002	0	0	0	0	1	0	0	0	0	1
8 8 2002	0	0	0	0	0	0	1	0	0	1
9 9 2002	2	0	0	0	0	0	0	0	0	2
18 10 2002	13	4	2	0	1	0	0	0	0	20
29 10 2002	11	6	11	0	4	0	0	0	0	32
8 11 2002	9	6	5	0	5	0	0	0	0	25
29 11 2002	3	11	5	0	3	0	0	0	0	22
9 12 2002	1	5	1	1	4	0	0	0	0	12
27 12 2002	1	8	2	0	2	0	0	0	0	13
9 1 2003	3	6	2	0	2	0	0	0	0	13
23 1 2003	0	2	2	0	1	0	0	0	0	5
5 2 2003	0	7	0	0	1	0	0	0	0	8
20 2 2003	1	8	5	0	1	0	0	0	0	15
3 3 2003	1	6	2	0	0	0	0	0	0	9
19 3 2003	2	2	6	0	6	0	0	0	0	16
4 4 2003	1	2	2	0	1	0	0	0	0	6
25 4 2003	0	3	0	0	0	0	0	0	0	3
27 5 2003	0	0	0	0	2	0	0	0	0	2
11 6 2003	0	0	0	0	2	0	0	0	0	2
26 6 2003	0	0	0	0	2	0	0	0	0	2

Peak; 32: (2001/2002 peak; 31)

OYSTERCATCHER *Haematopus ostralegus*

Date			Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10	7	2002	103	84	23	7	52	6	1	0	0	276
21	7	2002	193	116	6	0	42	1	4	0	0	362
8	8	2002	234	326	23	6	38	12	0	0	0	639
26	8	2002	351	165	10	2	23	2	20	2	0	575
9	9	2002	241	156	14	0	21	2	0	0	0	434
25	9	2002	230	31	54	0	0	0	0	0	0	315
18	10	2002	289	155	39	0	12	1	0	0	0	496
29	10	2002	192	132	0	4	30	2	0	0	0	360
8	11	2002	178	110	35	0	19	1	0	0	0	343
29	11	2002	237	113	29	3	18	1	0	0	0	401
9	12	2002	217	79	24	2	19	0	1	0	0	342
27	12	2002	83	36	24	0	47	0	0	0	0	190
9	1	2003	141	83	21	2	16	16	0	0	0	279
23	1	2003	193	89	37	6	22	0	0	0	0	347
5	2	2003	171	104	33	4	18	0	0	0	0	330
20	2	2003	131	159	29	0	41	8	0	2	0	370
3	3	2003	152	78	57	5	53	13	22	2	0	382
19	3	2003	51	63	17	9	35	0	0	9	0	184
4	4	2003	23	58	13	10	29	3	2	3	0	141
25	4	2003	25	101	5	2	17	0	0	1	0	151
6	5	2003	18	43	6	5	33	0	1	0	0	106
27	5	2003	33	67	7	1	12	10	3	0	0	133
11	6	2003	84	111	14	10	18	11	0	5	0	253
26	6	2003	76	110	23	19	28	7	3	3	1	270

Peak; 639: (2001/2002 peak; 518)

RINGED PLOVER *Charadrius hiaticula*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10 7 2002	0	7	0	0	0	0	0	0	0	7
21 7 2002	0	0	0	0	0	0	2	0	0	2
8 8 2002	1	41	0	0	0	3	0	0	0	45
26 8 2002	0	28	17	0	0	1	0	0	0	46
9 9 2002	0	41	21	0	2	0	0	0	0	64
25 9 2002	0	1	12	0	0	0	0	0	0	13
18 10 2002	0	0	0	1	5	0	0	0	0	6
29 10 2002	0	0	0	15	0	0	0	0	0	15
8 11 2002	0	1	6	0	0	0	0	0	0	7
29 11 2002	0	0	0	5	0	0	0	0	0	5
9 12 2002	0	0	0	0	6	4	0	0	0	10
9 1 2003	0	0	2	0	0	0	5	0	0	7
23 1 2003	0	0	0	0	5	0	0	0	0	5
5 2 2003	0	0	0	0	0	1	0	0	0	1
20 2 2003	0	1	0	0	6	0	0	0	0	7
3 3 2003	0	6	0	0	18	0	0	0	0	24
19 3 2003	0	4	0	0	13	0	0	0	0	17
4 4 2003	0	2	0	0	0	0	0	0	0	2
25 4 2003	0	12	0	0	0	0	0	0	0	12
6 5 2003	14	27	0	0	0	0	0	0	0	41
27 5 2003	0	0	0	0	3	1	0	0	0	4
11 6 2003	0	0	0	0	0	0	0	0	2	2
26 6 2003	0	0	6	0	0	0	0	0	0	6

Peak; 64: (2001/2002 peak; 74)

GOLDEN PLOVER *Pluvialis apricaria*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10 7 2002	0	0	0	0	23	0	0	0	0	23
21 7 2002	0	45	185	0	0	0	0	0	0	230
8 8 2002	0	0	0	50	340	60	360	0	0	810
26 8 2002	0	3	10	0	0	0	800	0	0	813
9 9 2002	0	199	1000	0	3500	0	0	0	0	4699
25 9 2002	0	1580	1930	600	175	0	0	0	0	4285
18 10 2002	0	0	20	0	0	0	0	0	0	20
29 10 2002	0	1460	0	0	0	700	0	0	0	2160
8 11 2002	0	42	0	0	0	0	0	0	0	42
29 11 2002	0	2	0	0	2800	0	1300	0	0	4102
9 12 2002	0	570	150	0	1225	0	0	0	0	1945
27 12 2002	0	66	0	0	0	0	0	0	0	66
9 1 2003	0	3	0	0	0	0	0	0	0	3
23 1 2003	0	155	0	0	0	0	0	0	0	155
5 2 2003	0	7	0	0	0	0	0	0	0	7

Peak; 4,699: (2001/2002 peak; 4,000)

LAPWING *Vanellus vanellus*

Date			Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10	7	2002	0	1	1	8	105	160	11	5	8	299
21	7	2002	0	52	350	0	220	404	0	0	0	1026
8	8	2002	0	0	0	0	2500	0	0	0	0	2500
26	8	2002	0	212	460	700	318	2300	0	0	0	4000
9	9	2002	0	920	1000	500	2500	0	300	0	3	5223
25	9	2002	0	90	270	330	150	0	30	0	0	870
18	10	2002	0	12	100	194	345	60	0	0	0	711
29	10	2002	0	3	248	57	135	460	58	0	4	965
8	11	2002	0	0	48	0	52	45	8	59	0	212
29	11	2002	0	33	90	94	700	380	790	5	2	2094
9	12	2002	0	60	1000	1	360	360	0	0	0	1781
27	12	2002	0	12	130	0	480	600	220	0	0	1442
9	1	2003	0	1	16	0	0	0	127	0	2	146
23	1	2003	0	1	18	0	371	360	100	0	0	850
5	2	2003	0	4	0	0	1	0	0	0	0	5
20	2	2003	0	2	0	0	20	0	0	0	0	22
3	3	2003	0	0	3	14	0	0	0	0	0	17
19	3	2003	0	0	0	0	0	48	0	0	0	48
25	4	2003	0	0	0	0	0	8	2	0	0	10
27	5	2003	0	0	0	0	5	0	17	28	0	50
11	6	2003	0	1	1	0	3	76	22	11	6	120
26	6	2003	0	16	6	65	212	66	200	16	3	584

Peak; 5,223: (2001/2002 peak; 6,000)

KNOT *Calidris canutus*

Date			Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10	7	2002	0	4	0	0	0	0	0	0	0	4
21	7	2002	0	0	46	0	1	0	0	0	0	47
8	8	2002	6	14	0	0	0	0	0	0	0	20
26	8	2002	29	28	0	0	0	0	0	0	0	57
9	9	2002	153	0	2	0	0	0	0	0	0	155
25	9	2002	50	4	0	0	120	0	0	0	0	174
18	10	2002	35	20	0	0	0	0	0	0	0	55
29	10	2002	340	40	0	0	0	0	0	0	0	380
8	11	2002	426	1	0	0	0	0	0	0	0	427
29	11	2002	23	300	0	0	0	0	0	0	0	323
9	12	2002	50	260	0	0	0	0	0	0	0	310
27	12	2002	270	0	0	0	0	0	0	0	0	270
9	1	2003	0	175	350	0	0	0	0	0	0	525
23	1	2003	295	32	0	0	51	0	0	0	0	378
5	2	2003	230	320	0	0	0	0	0	0	0	550
20	2	2003	310	45	0	0	0	0	0	0	0	355
3	3	2003	102	0	0	0	360	0	0	0	0	462
19	3	2003	20	12	0	375	0	0	0	0	0	407
4	4	2003	0	51	0	0	0	0	0	0	0	51

Peak; 550: (2001/2002 peak; 137)

DUNLIN *Calidris alpina*

Date			Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10	7	2002	0	1	0	0	2	0	0	0	0	3
21	7	2002	0	2	0	0	22	0	40	0	0	64
8	8	2002	0	76	15	5	0	85	0	0	0	181
26	8	2002	0	29	110	0	0	0	0	0	0	139
9	9	2002	0	11	20	0	488	0	0	0	0	519
25	9	2002	0	0	9	45	370	22	200	0	0	646
18	10	2002	0	76	2	0	1	170	180	3	0	432
29	10	2002	0	442	0	0	0	310	0	0	0	752
8	11	2002	0	0	30	0	0	0	580	0	0	610
29	11	2002	0	85	0	0	0	0	0	0	0	85
9	12	2002	0	10	0	0	0	235	0	0	0	245
27	12	2002	1	250	0	0	0	0	0	0	0	251
9	1	2003	0	0	0	0	500	0	0	0	0	500
23	1	2003	0	21	15	0	0	0	500	0	0	536
5	2	2003	0	0	170	0	45	26	0	0	0	241
20	2	2003	95	410	0	0	0	0	0	0	0	505
3	3	2003	10	47	25	0	32	0	270	0	0	384
19	3	2003	0	0	0	0	0	195	0	0	0	195
6	5	2003	2	38	0	0	0	0	0	0	0	41
27	5	2003	0	0	0	0	0	0	0	1	0	1

Peak; 752: (2001/2002 peak; 716)

BAR-TAILED GODWIT *Limosa lapponica*

Date			Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10	7	2002	1	0	1	0	11	0	0	0	0	13
21	7	2002	0	2	0	0	8	0	0	0	0	10
8	8	2002	0	3	1	0	0	0	0	0	0	4
26	8	2002	1	6	9	0	1	0	0	0	0	17
9	9	2002	0	3	5	0	1	0	0	0	0	9
25	9	2002	0	2	10	0	0	0	0	0	0	12
18	10	2002	10	12	8	0	3	0	0	0	0	33
29	10	2002	15	13	10	0	0	1	0	0	0	39
8	11	2002	2	13	4	0	0	0	0	0	0	19
29	11	2002	2	19	3	0	0	0	0	0	0	24
9	12	2002	2	24	0	0	4	0	0	0	0	30
27	12	2002	9	28	6	0	0	0	0	0	0	43
9	1	2003	0	1	93	0	15	0	0	0	0	109
23	1	2003	0	6	77	0	6	0	0	0	0	89
5	2	2003	0	61	8	0	0	0	0	0	0	69
20	2	2003	1	6	44	0	39	8	0	0	0	98
3	3	2003	0	0	4	0	72	0	0	0	0	76
19	3	2003	0	1	0	0	19	5	0	0	0	25
4	4	2003	0	0	0	0	2	0	0	0	0	2
25	4	2003	0	0	0	0	2	0	0	0	0	2
6	5	2003	0	0	0	0	3	0	2	0	0	5
11	6	2003	0	1	0	5	9	0	0	0	0	15
26	6	2003	0	0	0	0	4	0	0	1	0	5

Peak; 109: (2001/2002 peak; 89)

CURLEW *Numenius arquata*

Date			Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10	7	2002	4	86	10	4	177	102	19	0	0	402
21	7	2002	5	114	8	10	353	2	0	1	0	493
8	8	2002	2	121	20	2	620	0	11	0	0	776
26	8	2002	2	171	12	5	1240	140	22	0	1	1592
9	9	2002	5	144	26	21	370	205	0	0	1	772
25	9	2002	11	57	42	6	0	280	64	0	0	460
18	10	2002	6	33	15	5	113	11	1	20	1	205
29	10	2002	4	169	30	2	74	78	5	1	2	365
8	11	2002	16	68	12	4	12	12	9	0	1	134
29	11	2002	4	63	13	89	88	22	25	2	1	307
9	12	2002	26	45	2	1	77	0	1	0	0	152
27	12	2002	65	66	9	2	51	29	8	0	1	231
9	1	2003	3	25	8	10	14	2	6	0	1	69
23	1	2003	2	363	24	5	510	61	0	0	2	967
5	2	2003	2	67	6	5	11	36	12	0	0	139
20	2	2003	79	101	10	1	26	121	6	53	3	400
3	3	2003	2	46	31	9	59	6	0	4	2	159
19	3	2003	2	68	7	0	208	27	0	1	0	313
4	4	2003	1	22	5	0	14	4	4	0	0	50
25	4	2003	1	2	0	0	6	135	1	0	0	145
6	5	2003	0	19	0	2	4	4	4	0	0	33
27	5	2003	0	4	15	0	31	4	0	0	0	54
11	6	2003	0	10	3	0	23	35	5	0	0	76
26	6	2003	0	27	21	6	84	80	15	4	1	238

Peak; 1,592: (2001/2002 peak; 996)

REDSHANK *Tringa totanus*

Date			Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10	7	2002	0	1	12	0	244	116	21	0	0	394
21	7	2002	8	108	87	6	348	47	182	0	0	786
8	8	2002	0	410	60	4	671	470	151	0	0	1766
26	8	2002	0	122	521	70	210	640	0	0	0	1563
9	9	2002	0	421	72	88	546	257	80	0	2	1466
25	9	2002	38	381	117	384	520	66	220	0	0	1726
18	10	2002	166	273	61	76	485	194	64	12	2	1333
29	10	2002	47	95	21	48	351	177	46	2	1	788
8	11	2002	18	118	57	22	238	191	126	12	2	784
29	11	2002	46	93	51	45	221	225	31	11	0	723
9	12	2002	11	86	30	34	89	231	36	0	0	517
27	12	2002	13	71	15	17	149	208	46	2	1	522
9	1	2003	10	127	26	3	212	15	163	5	0	561
23	1	2003	33	53	35	104	329	131	8	0	0	693
5	2	2003	14	56	16	71	378	44	5	0	0	584
20	2	2003	13	75	21	21	115	186	24	2	0	457
3	3	2003	9	81	21	43	258	185	201	5	1	804
19	3	2003	8	84	23	39	174	264	189	1	2	784
4	4	2003	2	70	96	46	183	204	221	13	1	836
25	4	2003	1	37	2	1	139	59	2	2	1	244
6	5	2003	0	0	0	0	2	6	0	0	0	8
27	5	2003	0	0	0	2	0	1	1	5	0	9
11	6	2003	0	0	0	3	0	0	6	3	0	12
26	6	2003	0	0	0	2	1	1	0	47	0	51

Peak; 1,766: (2001/2002 peak; 1,277)

Particularly high numbers were recorded during the autumn migration.

TURNSTONE *Arenaria interpres*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
21 7 2002	0	0	0	0	1	0	0	0	0	1
8 8 2002	0	39	0	0	0	0	0	0	0	39
26 8 2002	0	23	5	0	0	0	0	0	0	28
9 9 2002	5	9	2	0	0	0	0	0	0	16
25 9 2002	0	2	1	0	0	0	0	0	0	3
18 10 2002	0	15	0	0	7	7	0	0	0	29
29 10 2002	12	10	0	1	0	0	0	0	0	23
8 11 2002	12	24	2	0	0	2	0	0	0	40
29 11 2002	13	37	0	0	2	0	0	0	0	52
9 12 2002	0	15	6	0	0	0	0	0	0	21
27 12 2002	9	21	0	0	0	0	0	0	0	30
9 1 2003	0	6	7	0	0	0	0	0	0	13
23 1 2003	0	6	3	0	0	0	0	0	0	9
5 2 2003	0	26	5	0	0	0	0	0	0	31
20 2 2003	4	15	8	0	0	0	0	0	0	27
3 3 2003	6	16	0	0	14	0	0	0	0	36
19 3 2003	2	7	0	0	0	0	0	0	0	9
25 4 2003	0	15	0	0	0	0	0	0	0	15
6 5 2003	0	2	0	0	0	0	0	0	0	2

Peak; 52: (2001/2002 peak; 50)

2.2 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.

Month	Eiders	Other species	Total
2002			
July	1277	2374	3651
August	769	7624	8393
September	1522	11266	12788
October	1303	5081	6384
November	854	6286	7140
December	1064	4921	5985
2003			
January	630	4108	4738
February	476	2984	3460
March	460	2654	3114
April	3361	1074	4435
May	2486	497	2983
June	2490	1083	3573

The total number of birds of all species on the estuary was strikingly higher in September than in any other month, due mainly to large numbers of Golden Plovers and Lapwings. There was a decrease in the total number of birds present in May and June, in spite of the increase in numbers of Eiders.

2.3 Comparison between 2001/02 and 2002/03

2.3.1 Total number of birds

There was some increase between 2001/02 and 2002/03 in the monthly mean numbers of birds of all species (including Eiders); numbers were higher in 2002/03 in nine of the 12 months. The peak of 12,788 in September 2002 was similar to those in September 2001 (12,628) and September 2000 (12,632).

Most of the increases in monthly mean numbers were in species other than Eiders, with numbers higher in 2002/03 in seven of the 12 months. Eiders, in contrast, had higher mean numbers in 2002/03 in only three of the 12 months. However, as was emphasised in previous reports to SNH, 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.

A less variable measure, the mean monthly total of species other than Eiders over the whole autumn and winter (August to February), showed an increase from 5,626 in 2001/02 to 6,036 in 2002/03. This value is similar to the 6,159 found in 2000/01.

2.3.2 Individual species

For each of the commonly-recorded species, the mean of the three highest counts in 2002/03 was compared with the same measure for the previous year (Patterson and Thorpe 2002).

Species	2001/02	2002/03	Change
Cormorant	49	42	-
Heron	42	43	+
Mute Swan	31	38	+
Shelduck	143	192	+
Eider	3388	3509	+
Wigeon	667	973	+
Teal	16	15	-
Mallard	29	39	+
Goldeneye	21	33	+
Red-breasted Merganser	28	26	-
Oystercatcher	507	570	+
Ringed Plover	63	52	-
Golden Plover	2628	4362	+
Lapwing	4886	3908	-
Knot	131	512	+
Dunlin	642	669	+
Bar-tailed Godwit	75	99	+
Curlew	948	1017	+
Redshank	1222	1685	+
Turnstone	39	44	+

Of the eight wildfowl species, six showed increases and two showed decreases, although some of the changes were very small. Of the 10 wader species, eight showed increases and three decreased. The data are of course subject to the difficulty that some species (eg Golden Plover and Lapwing) occurred in unusually large numbers in only a few counts out of the whole year, so that peak counts can be misleading. Peak counts were, however, appropriate for Eiders and Shelduck, which reached predictable seasonal peak numbers in the nesting season (usually in May).

An alternative measure, the median of the winter counts (1 September to 31 March) is not subject to this problem (Patterson and Cosgrove, 1998).

Species	Median 2001/02	2002/03	Change
Cormorant	19	13	-
Heron	5	9	+
Mute Swan	19	8	-
Wigeon	320	473	+
Teal	2	0	-
Mallard	9	2	-
Goldeneye	13	20	+
Merganser	17	13	-
Wildfowl total	404	538	+
Oystercatcher	332	345	+
Ringed Plover	5	7	+
Golden Plover	553	54	-
Lapwing	1149	781	-
Knot	79	367	+
Dunlin	342	466	+
Bar-tailed Godwit	44	36	-
Curlew	230	269	+
Redshank	703	754	+
Turnstone	24	25	+
Wader total	3461	3104	-
Overall total	3865	3642	-

Of the six species of wildfowl which normally have their highest numbers in winter (ie excluding Eider and Shelduck), two showed an increase in their median counts, while four decreased. Of the 10 wader species, seven increased and three decreased. The totals of the median values decreased for both wildfowl and waders, with a consequent decrease overall.

2.4 Species which occur less commonly on the Ythan, which were seen during the surveys

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

RED-THROATED DIVER *Gavia stellata*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
29 10 2002	1	0	0	0	0	0	0	0	0	1
27 12 2002	0	1	0	0	0	0	0	0	0	1
26 6 2003	0	0	1	0	0	0	0	0	0	1

SLAVONIAN GREBE *Podiceps auritus*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
18 10 2002	0	1	0	0	0	0	0	0	0	1
29 10 2002	1	0	0	0	0	0	0	0	0	1
8 11 2002	0	1	0	0	0	0	0	0	0	1

This species has become a regular visitor in autumn.

LITTLE EGRET *Egretta garzetta*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
8 8 2002	0	0	0	1	0	0	0	0	0	1

Recorded for the second year in succession.

SPOONBILL *Platalea leucorodia*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
11 6 2003	0	0	0	0	1	0	0	0	0	1

This species has now been recorded for four consecutive years

WHOOPER SWAN *Cygnus cygnus*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10 7 2002	0	0	0	0	1	0	0	0	0	1
18 10 2002	0	0	0	0	0	0	5	0	0	5
8 11 2002	0	0	0	0	0	15	0	0	0	15
19 3 2003	0	0	0	0	0	3	0	0	0	3

PINK-FOOTED GOOSE *Anser brachyrhychus*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
8 11 2002	0	1	0	0	0	0	0	0	0	1
9 1 2003	0	0	0	0	0	0	1	0	0	1
19 3 2003	0	0	0	0	0	2	0	0	0	2
27 5 2003	0	0	0	0	0	0	0	2	0	2

GREYLAG GOOSE *Anser anser*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10 7 2002	0	0	0	0	1	0	0	0	0	1
21 7 2002	0	0	0	0	2	0	0	0	0	2
8 8 2002	0	0	0	0	0	18	0	0	0	18
29 10 2002	0	0	0	0	0	33	0	0	0	33
8 11 2002	0	0	0	0	0	2	0	0	0	2

CANADA GOOSE *Branta canadensis*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10 7 2002	0	0	0	0	15	0	0	0	0	15
21 7 2002	0	0	0	0	8	0	0	0	0	8
8 8 2002	0	0	0	0	0	29	0	0	0	29
6 5 2003	0	0	0	0	0	0	0	2	0	2
11 6 2003	0	0	0	0	0	2	0	0	0	2

Numbers were, as usual, highest in late summer.

BRENT GOOSE *Branta bernicla*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
18 10 2002	0	2	0	0	0	0	0	0	0	2
8 11 2002	0	1	0	0	0	0	0	0	0	1
9 12 2002	0	0	0	0	0	3	0	0	0	3
20 2 2003	0	2	0	0	0	0	0	0	0	2
3 3 2003	0	2	0	0	0	0	0	0	0	2
19 3 2003	0	2	0	0	0	0	0	0	0	2

GADWALL *Anas strepera*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
25 9 2002	0	0	0	0	0	2	0	0	0	2

An unusual record for the estuary, although two were seen in March 2002.

PINTAIL *Anas acuta*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
3 3 2003	0	0	0	0	1	0	0	0	0	1

SHOVELER *Anas clypeata*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
6 5 2003	0	0	0	0	1	0	0	0	0	1

POCHARD *Aythya ferina*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
11 6 2003	0	0	0	0	0	1	0	0	0	1

TUFTED DUCK *Aythya fuligula*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
27 12 2002	0	1	0	0	0	0	0	0	0	1
5 2 2003	4	0	0	0	0	0	0	0	0	4
6 5 2003	0	0	0	0	0	0	0	0	2	2
27 5 2003	0	0	0	0	1	0	0	0	0	1
11 6 2003	0	0	0	0	0	0	1	0	0	1

SCAUP *Aythya marila*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
18 10 2002	4	0	0	0	0	0	0	0	0	4
29 10 2002	8	0	0	0	0	0	0	0	0	8
29 11 2002	8	0	0	0	0	0	0	0	0	8
9 12 2002	5	0	0	0	0	0	0	0	0	5
27 12 2002	0	17	0	0	0	0	0	0	0	17
5 2 2003	4	0	0	0	0	0	0	0	0	4
20 2 2003	4	0	0	0	0	0	0	0	0	4
25 4 2003	4	0	0	0	0	0	0	0	0	4

This species continues to be regular in the estuary, invariably in the lower reaches.

LONG-TAILED DUCK *Clangula hyemalis*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
18 10 2002	0	2	0	0	0	0	0	0	0	2
29 10 2002	0	1	0	0	0	0	0	0	0	1
29 11 2002	6	0	0	0	0	0	0	0	0	6
27 12 2002	3	0	0	0	0	0	0	0	0	3
9 1 2003	6	0	0	0	0	0	0	0	0	6
23 1 2003	3	0	1	0	0	0	0	0	0	4
20 2 2003	1	0	0	0	0	0	0	0	0	1
3 3 2003	5	0	0	0	0	0	0	0	0	5
19 3 2003	0	2	0	0	0	0	0	0	0	2

OSPREY *Pandion haliaetus*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10 7 2002	0	0	0	0	1	0	0	0	0	1
26 8 2002	0	3	0	0	0	0	0	0	0	3

A regular passage species in autumn.

GREY PLOVER *Pluvialis squatarola*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
25 9 2002	0	0	0	0	0	1	0	0	0	1
18 10 2002	1	1	0	0	0	0	0	0	0	2
29 10 2002	1	4	0	0	0	0	0	0	0	5
8 11 2002	1	3	0	0	0	0	0	0	0	4
29 11 2002	3	4	0	0	0	0	0	0	0	7
9 12 2002	0	3	0	0	0	0	0	0	0	3
27 12 2002	1	2	0	0	0	0	0	0	0	3
23 1 2003	0	2	0	0	0	0	0	0	0	2
5 2 2003	2	1	0	0	0	0	0	0	0	3
20 2 2003	0	5	0	0	0	0	0	0	0	5
3 3 2003	0	2	0	0	0	0	0	0	0	2

SANDERLING *Calidris alba*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
5 2 2003	2	0	0	0	0	0	0	0	0	2

Recorded much less frequently than usual.

CURLEW SANDPIPER *Calidris ferruginea*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
25 9 2002	0	0	0	0	1	0	0	0	0	1

Another species recorded more frequently in previous years.

SNIPE *Gallinago gallinago*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
25 9 2002	0	1	0	0	0	0	0	0	0	1
18 10 2002	2	4	0	0	0	0	0	0	0	6
29 10 2002	0	2	0	0	0	0	0	0	0	2
27 12 2002	0	1	0	0	0	0	0	0	0	1
3 3 2003	0	1	0	0	0	0	0	0	0	1

BLACK-TAILED GODWIT *Limosa limosa*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
21 7 2002	0	6	0	1	0	0	0	0	0	7
8 8 2002	0	4	0	0	0	0	0	0	0	4
26 8 2002	0	42	0	16	0	0	0	0	0	58
9 9 2002	0	111	1	2	22	0	0	0	0	136
25 9 2002	1	23	48	0	0	0	0	0	0	72
18 10 2002	0	22	0	5	0	0	0	0	0	27
29 10 2002	0	74	0	0	0	0	0	0	0	74
8 11 2002	0	48	12	0	0	0	0	0	0	60
9 12 2002	0	11	0	0	0	0	0	0	0	11
6 5 2003	0	1	0	0	0	0	0	3	0	4
27 5 2003	0	0	0	0	0	0	0	1	0	1

The count on 9 September was exceptional for north-east Scotland.

WHIMBREL *Numenius phaeopus*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
8 8 2002	0	0	0	0	6	0	0	0	0	6
6 5 2003	0	1	0	0	2	1	0	0	0	4

GREENSHANK *Tringa nebularia*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
10 7 2002	0	0	0	0	2	0	0	0	0	2
21 7 2002	0	0	0	0	2	0	0	0	0	2
8 8 2002	0	0	1	2	6	0	0	0	0	9
26 8 2002	0	0	2	1	2	1	0	0	1	7
9 9 2002	0	0	0	1	3	0	0	0	0	4
6 5 2003	0	0	0	0	0	0	0	1	0	1

COMMON SANDPIPER *Actitis hypoleucos*

Date	Mo	In	Qu	Ta	Sl	Ha	Sn	Ma	Lo	Total
8 8 2002	0	0	0	0	1	0	0	0	0	1
11 6 2003	0	0	0	0	1	0	0	0	0	1

3. DISCUSSION

As in previous years, the large month-to-month fluctuations in the numbers of some of the most abundant species on the estuary makes it difficult to compare overall bird numbers between 2001/02 and 2002/03, especially since many of the fluctuations may have been the result of large-scale movements, eg cold-weather effects or post-breeding dispersal, not related to conditions on the Ythan itself. Year-to-year comparisons must therefore be interpreted cautiously.

However, there was evidence of some increase in bird numbers between the two years. Species other than eiders had higher numbers in most months in 2002/03 than they had in 2001/02 and their monthly mean total over the whole autumn and winter was also higher. The majority of the common wader species had higher winter median numbers in 2002/03 than in the previous winter. Evidence from the wildfowl species, however, was ambiguous, with a rather puzzling difference between peak numbers (which tended to increase between the two years) and winter median numbers (which tended to decrease). Both of the main breeding species, Eiders and Shelduck, however, showed increases in their peak counts.

The results of the study were presented in poster form at the Ythan Project open day at Fyvie Castle on 8 March 2003. A large number of people attended the event and were able to see how the study related to other features of the Ythan catchment.

4. REFERENCES

Patterson, I.J. and Cosgrove, P.J. 1998. Waders and waterfowl on the Ythan estuary, 1997/1998. *Scottish Natural Heritage Archive Report No. 007.*

Patterson, I.J. and Thorpe, A.W. 2002. Waders and waterfowl on the Ythan estuary, 2001/2002. *Scottish Natural Heritage Archive Report No. 011.*

APPENDIX 1. SURVEY METHODS

1.1 Field survey

Eiders were counted at high tide, when they were roosting on the shore or in sheltered bays, so that errors due to movement and diving would be minimised. All of the other species were counted at low tide, when they were feeding and so were dispersed over the intertidal area; roost counts at high tide were not practicable because roost sites were dispersed (some of them not known) and because some waders were known to feed in fields at high tide in mid-winter.

All surveys started at the estuary mouth and proceeded upstream, so as to minimise the risk of the count being curtailed by the incoming tide. Counts were made from standard observation points (Figure 1) and the counts were subdivided into nine areas of the estuary (Figure 1), so that the distribution of each species could be described. The observer moved quickly by car from one observation point to the next, so as to minimise errors due to birds moving between sections during the survey. Any such movements seen while driving were noted and allowed for in the counts.

1.2 Data analysis

The count data were recorded on a pro-forma recording sheet and later stored on computer in a dBase database. At the end of the survey year (after 30 June) the data were checked, sorted and analysed, using dBase functions and specially-written dBase programs.

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