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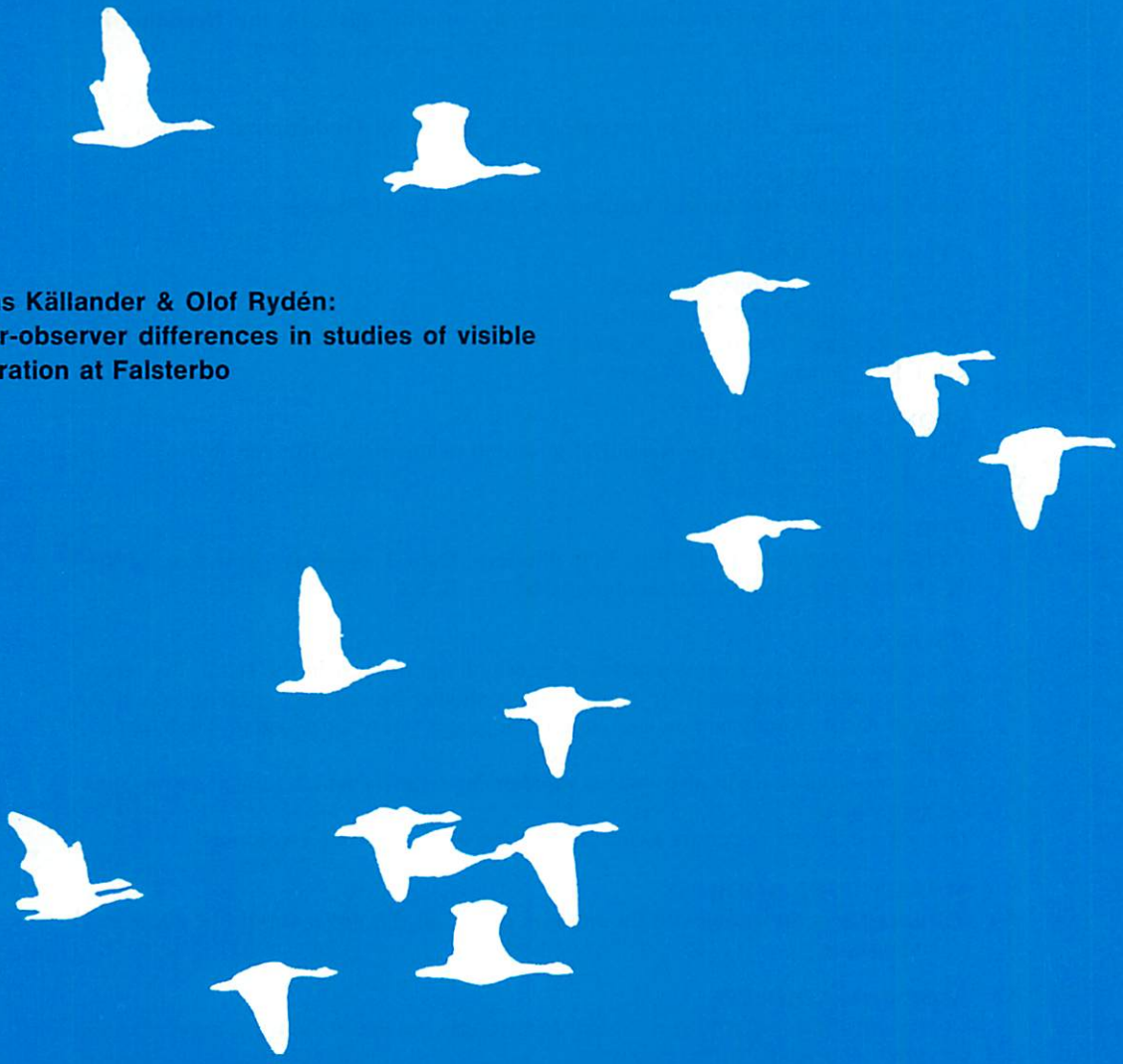

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Inter-observer differences in studies of visible migration at Falsterbo

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Inter-observer differences were studied at Falsterbo on four occasions. Sixteen experienced observers, four on each occasion, simultaneously and independently recorded the migration. No single observer could record the entire migration even under moderate conditions. Observers were relatively efficient in recording raptors and abundant and easily detected species. Observers were compared with regard to the number of species and individuals recorded. Any two observers both recorded 50–80 % of all species in their pooled records. For species occurring in sufficient numbers for analysis, the inter-observer agreement, i. e. the percentage of individuals two observers both recorded related to the highest number recorded by either of them, ranged between 26 and 88 %; for five species that were well represented on more than one occasion the corresponding proportions varied between 59 and 80 %.

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INTRODUCTION

Much information on the diurnal migration of birds has been collected by systematic observation in localities where heavy concentrations of migrating birds are regularly found. Our knowledge of the effects of weather on migration and of the seasonal distribution of migration of many species is primarily obtained from such studies. But there are difficulties: it is known, for instance, that a substantial and varying part of the total migration takes place at heights where it is impossible to see the birds from the ground (Eastwood 1967). Furthermore, meteorological conditions, especially the speed and direction of the wind, influence the exact migration path. The varying accessibility of the migration to observation thus reduces the reliability of visual counts, and comparisons between years and days must be made with great caution.

Even if only highly competent ornithologists record visible migration, their ability to detect and record passing birds differs. As a consequence, an observed difference in numbers between two seasons for a given species is to an unknown extent attributable to differences in the capacity of the observers. The magnitude of this source of error is poorly known. Enemar (1964) concluded that skilled ornithologists overlook, on average, every second individual and four out of ten species. Källander et al. (1972) found that when recording sea-bird migration through Kalmar Sound in south-east Sweden, competent observers agreed relatively well with regard to the numbers of the conspicuous and dominating Eider *Somateria mollissima*, whereas inter-observer differences in-

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creased dramatically for less abundant species. Sea bird migration is relatively easily observed at least in this locality, since few species are involved, and observation from the land can be concentrated in one direction.

To estimate the magnitude of inter-observer differences in recording visible migration we decided to conduct a series of experiments at Falsterbo (13°50'E, 55°20'N), where land birds make up most of the migration. Because of the larger number of species and individuals involved, as well as the complexity of the migration itself, it seemed to us that this would be an ideal locality.

METHOD

Our procedure was partly adopted from Enemar (1964). Four observers independently recorded the migration. They were separated by screens at 8 m intervals and equipped with similar binoculars. They were instructed to record all migrating birds. Another group of three or four ornithologists (control group) simultaneously observed the migration. In the present paper the observers' records have not generally been related to those of the control group. Observations were carried out on four separate days. The observation period on each occasion was about three hours, giving a total period of observation of 12.5 hours. The observers were experienced ornithologists, who were well aquainted with the locality. In all 16 observers took part.

OBSERVATION PERIODS

For a general description of the topography of the Falsterbo peninsula and for an account of its bird migration, the reader is referred to Rudebeck (1950). All observations were made in September and October when migration is at its maximum at Falsterbo. Weather conditions and the main features of migration on the different occasions are briefly described below.

19 October 1968

Observations took place between 0740 and 0940 and between 1010 and 1200 hrs. There was a weak northwesterly wind and the temperature was about 3–4° C. Initially the sky was completely overcast, but during the period it cleared and the temperature rose. Visibility was good.

Several features of the migration complicated observation. Firstly, many species were involved with different patterns of migration. Secondly, certain groups such as pigeons *Columba,* corvids and Starlings *Sturnus vulgaris* not only passed in relatively large numbers but also on a broad front. A large proportion of the buzzards *Buteo* returned after attempting migration, and sometimes buzzards were simultaneously flying in two or more directions, which meant that the observers had to spend much time and effort to establish which individuals actually left the peninsula.

14 October 1969

Observations took place between 0720 and 0910 and between 0925 and 0955 hrs. The sky was overcast, but visibility was fairly good. There was a weak southwesterly wind and a temperature of about 8°C.

Starlings, *Fringilla* finches, and cardueline finches dominated. The flocks passed as a comparatively narrow stream above the observers, which facilitated detection, but also at different levels at great height. This, together with the fact that migration was fairly intense, rendered observation less easy.

19 September 1970

Observations took place between 0610 and 0910 and between 1010 and 1105 hrs. The sky was overcast, clearing up towards the end of the period. There was a weak to moderate, gradually waning wind from the southwest, and visibility was good. The temperature was 13°C at the start, thereafter rising.

The migration was intense and dominated by a continuous passage of Chaffinches *Fringilla coelebs* and some Siskins *Carduelis spinus* at a relatively great height. Siskins also passed low in flocks. Loose assemblages of Meadow

Pipits *Anthus pratensis*, Yellow *Motacilla flava* and White *Motacilla alba* Wagtails passed near the ground. Tree Pipits *Anthus trivialis* were often heard from a great height but were difficult to see. Hirundines, mostly Swallows *Hirundo rustica*, migrated on a broad, low front.

The complicated character of the migration made it highly unlikely that a single observer could record simultaneously the perpetual stream of Chaffinches and the various species passing low around him.

25 October 1970

Observations took place between 0750 and 1010 hrs. The sky was overcast at the start and at the end, with a clear period in between. There was a weak to moderate south southwesterly wind and the temperature was about 10°C.

The migration was exceptionally uncomplicated. Few species were involved; Starlings dominated and passed close to the observers in flocks of tens or a couple of hundreds. Meadow Pipits, Siskins, Linnets *Carduelis cannabina*, and Greenfinches *Carduelis chloris* were also easily detected. Some flocks of Linnets, Greenfinches and Sparrowhawks *Accipiter nisus* presented some difficulties to the observers, since they tended to return after attempted migration.

RESULTS AND DISCUSSION

Records from all observers and the control group are shown in Tables I–IV. Sea-birds and waders are excluded since observation conditions for some of them were not quite equal for all observers.

19 October 1968 (Table I)

Considerable differences were found for corvids. A, C, and D agreed fairly well on the number of Jackdaws *Corvus monedula*, while B reported a much lower number. The variation for the Rook *Corvus frugilegus* was 58–272 and for the Hooded Crow *Corvus corone* 209–833. Some of these discrepancies may be explained by the fact that adverse light made separation of Rooks and Crows at a distance rather difficult. The figures for the Starling range from 2,735 for A to only 471 for B.

Considering less abundant species, only B noticed the migrating finches to any extent and was outstanding in sorting out the Roughlegged Buzzards *Buteo lagopus*. In general, however, B's capacity was somewhat lower than that of the others.

Up to 200 Magpies *Pica pica* repeatedly attempted migration thereby creating a very confusing situation. This resulted in 51 and 95 individuals being erroneously recorded as migrants by two observers.

14 October 1969 (Table II)

Starlings, *Fringilla*, and cardueline finches dominated. There is a relatively low variation in the figures for the Starling – from 7,044 to 8,875 recorded individuals. While there is high consistency in the numbers of cardueline finches as a group, the totals for the different species show considerable variation. This is partly a consequence of a varying number of birds not identified as to species. While two of the observers agreed closely with respect to the number of Greenfinches and Siskins recorded, 719 against 738 and 713 against 775 respectively, the greatest difference between any two observers for these species is much larger, 89 against 738 and 713 against 2,422 respectively. The *Fringilla* finches, which constituted around 50 % of total migration, were estimated to 4,507 by F, while H recorded more than twice as many, 10,652.

19 September 1970 (Table III)

Relative to the control group, a few species, viz. the Chaffinch and the Siskin, were generally overlooked, probably partly due to the high mean intensity of the migration (640 birds/min) and partly because they passed rather high. Regarding the Chaffinch, three observers showed a remarkable agreement, recording 16,800, 17,090, and 17,980 individuals respectively, while the fourth observer reported 43,610. The picture is similar for the Siskin;

Table I. Recorded migration on 19 October 1968. Co = control group, A, B, C, and D = the individual observers. Minus sign denotes return migration

	Co	A	B	C	D
Buteo buteo	774	246	141	465	581
B. lagopus	10	3	15	2	7
Buteo sp.	264	587	554	0	48
Accipiter nisus	154	69	72	51	74
Milvus milvus	1	0	0	1	1
Haliaetus albicilla	1	0	0	0	0
Circus cyaneus	1	0	0	0	0
Circus sp.	0	0	1	0	0
Falco columbarius	0	1	0	0	0
F. tinnunculus	2	0	2	0	0
Columba oenas	34	16	5	41	56
C. palumbus	6,163	8,871	1,289	8,957	6,103
C. livia 'domestica'	5	0	0	2	7
Streptopelia decaocto	1	0	0	0	6
Streptopelia sp.	0	0	0	0	2
Dendrocopus major	0	0	0	3	5
Lullula arborea	30	3	0	0	8
Alauda arvensis	23	24	22	0	17
Eremophila alpestris	0	2	0	0	0
Hirundo rustica	44	15	16	6	27
Corvus corone	783	833	209	330	329
C. frugilegus	240	79	272	58	148
C. monedula	2,126	690	362	951	790
Corvus sp.	95	177	540	130	0
Pica pica	0	0	51	95	−9
Nucifraga caryocatactes	2	0	2	2	2
Garrulus glandarius	2	−1	0	0	0
Parus major	0	0	0	2	0
P. caeruleus	46	0	0	5	2
Turdus pilaris	61	5	3	31	12
T. philomelos	1	0	1	0	0
T. musicus	24	0	40	−2	0
Turdus sp.	50	0	934	0	13
Prunella modularis	1	2	6	1	16
Anthus pratensis	0	1	1	4	6
A. spinoletta	0	1	0	0	0
Lanius excubitor	0	0	1	0	0
Sturnus vulgaris	4,387	2,735	471	2,125	1,635
Coccothraustes coccothraustes	0	0	0	0	2
Carduelis chloris	8	0	0	0	0
C. carduelis	8	14	6	−16	7
C. spinus	5	2	5	2	0
C. cannabina	3	0	0	6	0
Pyrrhula pyrrhula	19	9	0	0	2
Loxia sp.	10	0	0	0	0
Fringilla coelebs	54	20	104	0	0
F. montifringilla	35	2	30	5	0
Fringilla sp.	310	5	273	20	35
Emberiza citrinella	43	21	0	−6	5
E. schoeniclus	1	3	3	1	0
Plectrophenax nivalis	1	0	0	0	0
Passer sp.	0	0	0	0	15
Passeriformes non det.	10	25	0	0	94
Total	19,252	14,461–1	7834	13,333–24	10,055–24
Number of identified species	35	26	25	27	26

Table II. Recorded migration on 14 October 1969. Co = control group, E, F, G, and H = the individual observers. Minus sign denotes return migration

	Co	E	F	G	H
Columba oenas	0	40	30	0	16
C. palumbus	45	55	15	0	15
Columba sp.	−29	0	40	115	0
Alauda arvensis	114	29	43	44	20
Hirundo rustica	26	9	16	2	13
Corvus corone	4	3	6	5	1
C. frugilegus	3	4	0	0	7
C. monedula	13	16	16	7	7
Corvus sp.	0	0	0	7	0
Turdus musicus	0	0	0	0	2
Anthus pratensis	151	120	168	100	38
A. trivialis	1	0	0	6	1
A. spinoletta	0	0	1	0	1
Anthus sp.	6	0	0	2	36
Motacilla alba	2	0	5	0	7
Lanius excubitor	1	1	0	0	0
Sturnus vulgaris	9,178	7,044	8,081	7,250	8,875
Carduelis chloris	908	719	738	89	343
C. carduelis	8	14	3	0	0
C. spinus	1,800	2,422	1,442	713	775
C. cannabina	437	263	361	404	262
C. flavirostris	10	0	3	0	0
Carduelis sp.	254	220	25	1,548	480
Fringilla coelebs	105	27	0	29	23
Fringilla montifringilla	0	0	6	0	12
Fringilla sp.	11,724	7,073	4,501	5,073	10,617
Emberiza citrinella	12	10	4	9	3
E. schoeniclus	27	20	49	13	18
Passer montanus	0	1	0	0	1
Passer sp.	0	0	0	2	0
Passeriformes non det.	76	0	0	343	0
Total	24,905–29	18,090	15,553	15,761	21,573
Number of identified species	19	18	18	13	21

one observer reported only 40 individuals, the others 365, 536, and 584 respectively.

The buzzards received everyone's attention; the variation in the total number recorded is moderate – from 294 to 407 – and corresponds fairly well with the estimate of the control group (444). It is interesting to note, however, how the identification as to species differs between observers. The highest number of Common Buzzards *Buteo buteo* recorded is 321, the lowest 6, while the corresponding figures for the Honey Buzzard *Pernis apivorus* are 172 and 65 (cf. Enemar 1964).

For the Sparrowhawk, Swallow, and White Wagtail, three observers agreed reasonably well, while the remaining observer recorded a much higher or lower total. Records for the Meadow Pipit, Sand Martin *Riparia riparia*, and Starling show good overall agreement.

25 October 1970

Compared with the preceding experiment this one was less demanding – one single species, the Starling, dominated. Since the Starlings passed very close to the observers and were easy to detect, the variation in totals, from 3,770 to 6,715, is probably largely an effect of differing flock-size estimates. With a few exceptions, there is a remarkable agreement for most other species. Thus one of the observers deviated markedly from the others in recording

Table III. Recorded migration on 19 September 1970. Co = control group, I, K, L, and M = the individual observers

	Co	I	K	L	M
Buteo buteo	45	321	6	96	135
Pernis apivorus	291	65	172	97	72
Buteo/Pernis	108	21	116	198	145
Accipiter nisus	76	69	43	49	48
Milvus milvus	0	1	0	0	0
Pandion haliaetus	1	1	1	1	1
Falco columbarius	0	1	0	0	1
F. tinnunculus	0	2	1	1	1
Falco sp.	0	0	1	0	0
Columba oenas	34	14	21	7	2
C. palumbus	4	4	0	4	12
C. livia 'domestica'	5	0	4	0	0
Hirundo rustica	2,016	1,121	639	1,121	1,037
Delichon urbica	22	4	9	2	10
Riparia riparia	112	25	37	31	30
Hirundinidae	180	0	209	0	0
Corvus corone	1	0	1	1	0
Turdus philomelos	1	0	0	0	0
Oenanthe oenanthe	1	0	1	0	0
Prunella modularis	3	0	1	0	1
Anthus pratensis	1,113	962	734	945	842
A. campestris	0	0	0	0	1
A. trivialis	47	96	195	311	343
A. cervinus	7	6	4	2	5
A. spinoletta	0	6	0	0	0
Anthus sp.	1	0	0	0	0
Motacilla alba	72	63	114	510	126
M. flava	59	70	123	105	104
Sturnus vulgaris	1,099	550	474	555	522
Carduelis chloris	6	0	13	26	0
C. spinus	1,577	365	584	40	536
C. cannabina	6	244	0	1	27
Fringilla coelebs	143,358	16,800	43,610	17,090	17,980
Emberiza schoeniclus	4	3	5	0	2
Passeriformes non det.	3	200	0	140	0
Total	150,252	21,014	47,118	21,333	21,983
Number of identified species	25	23	23	21	23

more Meadow Pipits and Greenfinches and was the only one to report Bramblings *Fringilla montifringilla*. On the other hand, this observer recorded no Linnets.

Recording efficiency for different categories of the migrating birds

One way to compare the observers is to analyse the way their relative efficiency is distributed among different aspects of the total migration. This was done for each period of observation by establishing categories of birds which differ in their mode of migration, e. g. solitary vs. migrating in flocks, scattered vs. defined in space, fast vs. slow, etc. Each observer's effectiveness, relative to the control group, was then ranked, and the rankings of all observers compared. The correlation between the rankings for all observers is expressed by the Kendall coefficient of concordance (W).

In the first period of observation the following six categories were established: Sparrowhawk, buzzards, pigeons, fringillids, Starling, and corvids. The test failed to show any correlation between the observers ($W = 0.35$, n. s.),

Table IV. Recorded migration on 25 October 1970. Co = control group, N, O, P, and R = the individual observers

	Co	N	O	P	R
Ardea cinerea	0	1	0	0	1
Buteo buteo	0	0	0	0	1
B. lagopus	2	2	1	2	0
Buteo sp.	0	0	0	0	1
Accipiter nisus	20	35	23	23	20
Columba livia 'domestica'	1	1	1	0	1
Alauda arvensis	17	30	17	13	9
Corvus corone	19	20	9	27	16
C. frugilegus	5	1	26	13	11
C. monedula	17	11	20	19	22
Corvus sp.	0	25	32	0	25
Turdus pilaris	1	2	30	1	0
Anthus pratensis	54	39	82	40	45
A. spinoletta	0	0	1	0	1
Bombycilla garrulus	0	16	0	0	0
Sturnus vulgaris	7,779	6,103	5,405	3,770	6,715
Carduelis chloris	182	152	220	135	138
C. carduelis	4	4	2	5	4
C. spinus	100	73	67	74	88
C. cannabina	97	33	0	29	61
C. flavirostris	10	37	16	14	25
Carduelis sp.	60	0	0	26	0
Loxia sp.	5	5	5	14	5
Fringilla montifringilla	0	0	141	0	0
Fringilla sp.	24	0	0	0	0
Fringillidae	0	0	52	0	0
Emberiza citrinella	29	14	16	14	9
Passeriformes non det.	0	114	0	0	203
Total	8,427	6,721	6,166	4,219	7,402
Number of identified species	16	18	17	15	17

which means that their attention, or ability, was unevenly distributed on these categories of birds. Although no consistent pattern was found, buzzards and pigeons usually ranked highest.

On the second occasion, the same test was applied to the categories Skylark *Alauda arvensis*, Meadow Pipit, Starling, cardueline finches, and *Fringilla* finches. A significant agreement between the observers was found ($W = 0.64$, $P < 0.05$). Compared with the control group the observers generally concentrated on the Starlings and cardueline finches.

There is a high correlation between the observers in their relative effectiveness for different categories on the third occasion ($W = 0.91$, $P < 0.01$; categories: buzzards, Sparrowhawk, hirundines, Meadow Pipit, Starling, and Chaffinch plus Siskin). The raptors and Meadow Pipit obtained the highest rankings.

Probably as a consequence of the low number of species that took part in the migration, there is a high correlation in the distribution of the effectiveness of the observers on the last occasion ($W = 0.81$, $P < 0.01$, calculated on the categories Sparrowhawk, Siskin plus Twite *Carduelis flavirostris*, Greenfinch plus Linnet, and Starling). The Sparrowhawk ranked highest followed by Siskin plus Twite.

The only occasion when no correlation was established, i. e. the first one, was characterized by more species than the others. It seems likely that with an increased number of species the chance becomes less that the observers make the same species preferences. When the same preferences are made they apparently favour

raptors and species that are easy to detect (provided that the recording efficiency of the control group is reasonably evenly distributed among the different categories of birds).

Comparisons of the number of species recorded

To measure their ability to record the qualitative aspects of migration, the observers were compared in couples, the number of species detected by both observers being expressed as a percentage of that observed by either or both. The percentage therefore indicates to what extent two observers agreed upon which species took part in migration (Fig. 1). This percentage varies from 50 to 84 and corresponds with the W-values presented above (56 % – 0.35, 64 % – 0.64, 73 % – 0.91, and 75 % – 0.81). Naturally, when the observers direct their attention to different aspects of the migration in a similar way they tend to detect and record the same species.

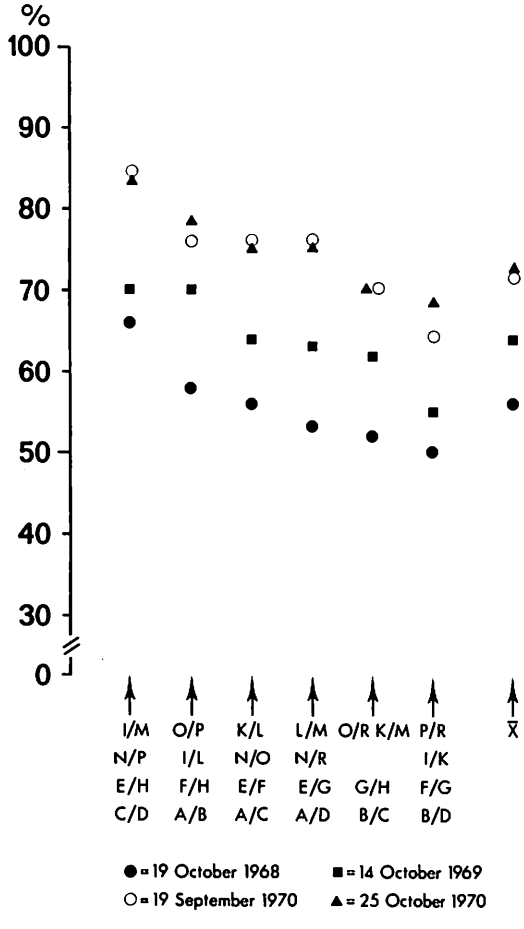

Fig. 1. Comparison of the number of species recorded. The number of species recorded by both observers is expressed as a percentage of that observed by either or both. The values are arranged in decreasing magnitude.

Comparisons of the number of individuals recorded

The number of individuals recorded for each species often varies considerably between observers (Tables I–IV). The most notable of these differences have already been pointed out. An attempt was made to quantify the differences by comparing all observers on each occasion two at a time. The lowest number of individuals recorded for each species presented as a percentage of the highest in each pair expresses the degree of agreement between the observers. For this analysis, species were selected that migrated in sufficient numbers and in a typical pattern to make comparisons meaningful. The results are shown in Table V. There is a concentration of values between 50 and 80 % with mean correspondences around 60 %.

When inter-observer agreement on species content (Fig. 1) and that on number of individuals (Table V) are compared, a similar distribution of means is found on the four occasions, indicating a positive correlation between these two measurements.

In Table VI five species have been selected that were well represented on 2–4 occasions, making 12–24 pairwise comparisons available. Means and standard error (calculated separately for each occasion and averaged) were computed to get a more generalized measurement of inter-observer agreement.

Inter-observer differences are much more difficult to evaluate for species that are represented by only a few individuals. Nevertheless, some of these are interesting for two reasons: they normally occur in small numbers each season and are considered easily detected. As examples in our observation pe-

Table V. Percentage agreement between pairs of observers for selected species. The percentage is calculated on the basis of the higher of the two records of each pair

First occasion, 19 Oct. 1968

Pair of observers	A–B	A–C	A–D	B–C	B–D	C–D	Mean
Accipiter nisus	96	74	93	71	97	69	85
Buteo buteo	57	53	42	30	24	80	48
Columba palumbus	15	99	69	14	21	68	48
Sturnus vulgaris	17	78	60	22	29	77	47
Corvus monedula	52	73	87	38	46	83	62
C. frugilegus	29	73	53	21	86	39	50
C. corone	25	40	39	63	64	100	55
Mean	42	70	63	37	52	74	

Second occasion, 14 Oct. 1969

Pair of observers	E–F	E–G	E–H	F–G	F–H	G–H	Mean
Alauda arvensis	67	66	69	98	47	45	65
Anthus pratensis	71	83	32	60	23	38	51
Sturnus vulgaris	87	97	79	90	91	82	88
Carduelis chloris	97	12	48	12	46	26	40
C. spinus	60	29	32	49	54	92	53
C. cannabina	73	65	100	89	73	65	78
Emberiza schoeniclus	41	65	90	27	38	72	56
Mean	71	60	64	61	53	60	

Third occasion, 19 Sept. 1970

Pair of observers	I–K	I–L	I–M	K–L	K–M	L–M	Mean
Buteo buteo	2	30	42	6	4	71	26
Pernis apivorus	38	67	90	56	42	74	61
Accipiter nisus	62	71	70	88	90	98	80
Hirundo rustica	57	100	93	57	62	93	77
Riparia riparia	68	81	83	84	81	97	82
Anthus pratensis	76	98	88	77	87	89	86
A. trivialis	49	31	28	63	57	91	53
Motacilla alba	55	12	50	22	90	25	42
M. flava	57	67	67	85	85	100	77
Sturnus vulgaris	86	99	95	85	91	94	92
Carduelis spinus	63	11	68	7	92	7	41
Fringilla coelebs	39	98	93	39	41	95	68
Mean	54	64	72	56	69	78	

Fourth occasion, 25 Oct. 1970

Pair of observers	N–O	N–P	N–R	O–P	O–R	P–R	Mean
Accipiter nisus	66	66	57	100	87	87	77
Alauda arvensis	57	43	30	76	69	69	49
Corvus frugilegus	4	8	9	50	42	85	33
Anthus pratensis	48	98	87	49	55	89	71
Sturnus vulgaris	89	62	91	70	80	56	75
Carduelis chloris	69	89	91	61	63	98	79
C. spinus	92	99	83	91	76	84	88
Mean	61	66	64	71	67	81	

riods can be mentioned Heron *Ardea cinerea,* Sea Eagle *Haliaetus albicilla,* Red Kite *Milvus milvus,* Osprey *Pandion haliaetus,* and Hen Harrier *Circus cyaneus* (all of which passed close to the observers; Tables I, III, IV). It was found that 9 records were made of these birds out of a total of 24 possible. Thus, when recording the entire migration, experienced ornithologists can overlook even these birds.

CONCLUSIONS

Any conclusions to be drawn from these experiments must be based on a consideration of the generality of the results. Although experienced ornithologists, the participating observers did not have day-to-day experience, which no doubt increases the capability of a regular observer. The effectiveness of a regular observer, however, necessarily varies which is probably an unavoidable result of day-long, laborious observation. On the other hand, our observers knew that their records were going to be compared, which almost certainly motivated them to do their best. Since the observation periods lasted for only a few hours, their vigilance was not affected by tiredness or boredom. The experimental situation apparently compensated, at least partly, for the less day-to-day experience of our observers.

Inter-observer differences occur due to discrepancies in flock size estimates, species identification, and, undoubtedly most important, varying ability to detect the birds. The average amount of error is difficult to estimate, because it varies according to characteristics of the migration, weather conditions, and differential effectiveness of the observer. Only for a few species have sufficient data been obtained to allow such an estimate. If the data of Table VI are accepted as representative of the species involved, one can conclude that if the records of two experienced observers are compared, one would on average expect the following proportions of obtained differences to be attributable to inter-observer differences: Sparrowhawk 10–30 %, Meadow Pipit 15–45 %, Starling 15–35 %, Greenfinch 20–60 %, and Siskin 25–55 %. The ranges represent approximately the two standard error limits.

Table VI Mean percentage agreement between pairs of observers for five well represented species

Species	Number of possible pair comparisons	Mean ± S. E.
Accipiter nisus	18	80 ± 5.5
Anthus pratensis	18	69 ± 6.8
Sturnus vulgaris	24	75 ± 4.5
Carduelis chloris	12	59 ± 9.0
C. spinus	18	61 ± 8.5

If one wants to apply our results to data collected at Falsterbo one must bear in mind that inter-observer differences can either accumulate or cancel each other out, and that the chances of cancelling out would increase with more observers involved. If one deals with a trend, the trend would, of course, become less and less influenced by inter-observer differences the more years that are included. One might add that other sources of error affect observation data, with weather conditions probably being the most important.

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