

Museum (Natural History), and at Slimbridge. Details of some recoveries, particularly from abroad, continue to appear in the annual accounts of ringing published by the B.T.O. in *British Birds*. The latest such report (R. Spencer 1955: *British Birds* 48: 461-498) includes a map illustrating the distribution of ringed Teal recovered abroad in 1954.

For the benefit of students not able to consult the original sources, the Trust hopes to be able to publish from time to time 'complete' recovery lists. Since the expense of printing such lists is heavy it will probably be necessary to limit them to a small number of duplicated copies.

WILDFOWL COUNTS IN THE BRITISH ISLES

By G. Atkinson-Willes

THE Wildfowl Count season of 1954-55 proved to be the most successful so far. A record number of waters were counted regularly, 40 more than in the previous season, and a peak total of almost a quarter of a million wildfowl were observed. This most satisfactory progress is best demonstrated by Table I which shows the number of waters covered regularly each month throughout the season and the number of those for which occasional or sporadic returns have been received.

TABLE I

The Progress of Wildfowl Counts in the British Isles

	1948-49	1949-50	1950-51	1951-52	1952-53	1953-54	1954-55
<i>Regular Counts:</i>							
England	185	242	219	368	327	345	400
Scotland	37	50	53	85	77	91	93
Wales	7	7	3	7	6	14	16
Ireland	—	—	—	18	39	36	17
	229	299	275	478	449	486	526
<i>Occasional Counts:</i>							
England	253	163	166	137	124	105	141
Scotland	86	37	52	42	39	22	32
Wales	5	6	7	5	5	9	11
Ireland	—	—	—	12	3	6	3
	334	206	225	196	171	142	187
<i>Total Regular and Occasional Counts</i> ..	573	505	500	674	620	628	713

The response to the request for information on wildfowl on minor waters is reflected in the increase in the number of occasional counts. Last season 122 waters were covered for the first time, 53 of them regularly, bringing the total of waters for which information of varying quality is available to about 1225.

THE RESULTS OF THE 1954-55 COUNTING SEASON

In order to make the fullest use of the record number of regular counts in 1954-55, the results for eight species of common wildfowl are examined for this single season. The species selected are Mallard, Teal, Wigeon, Pintail, Shoveler, Pochard, Tufted and Goldeneye.

It cannot be too strongly emphasised that the wildfowl count results do not in any way represent a census of the total numbers of the species resident or wintering in the British Isles. Only 526 of the many thousands of waters in the country are visited regularly, but, as many of the main wildfowl habitats are covered, it is maintained that fluctuations and trends in the populations on them will reflect similar trends in the total population of the country.

Before considering the records of the eight species, the reliability of the counts on each of the nine set dates must be assessed. The figures are based on a sample of 526 waters, 146 coastal and 380 inland, and although all these are classed as 'regular', in fact some were not visited on one or more occasions. In these cases an estimated figure based upon the remaining counts has been inserted, and this, naturally, is a serious source of possible error. The number and size of these interpolated estimates have a direct bearing on the reliability of the count in question, and it has been decided, rather arbitrarily, that an average of more than one interpolation in ten counts must render the grand total for that month open to suspicion. Similarly if the sum of the interpolations in any one month amounts to more than 10% of the grand total, the possible error is too great to be acceptable.

The size of the interpolations, being dependent on the nature of the uncounted waters and on the habits of the various species, must be considered individually, but the number of interpolations on each date remains constant. Table II below shows in the left-hand column the size of the full samples, and in the remaining columns the number of uncounted waters on each date, for which interpolations have been made. The numbers in italics amount to more than one-tenth of the sample.

TABLE II
Number of Uncounted Waters in 1954-55 Sample

1954-55	Sample Size	Aug. 1	Aug. 29	Sept. 26	Oct. 24	Nov. 21	Dec. 19	Jan. 23	Feb. 20	Mar. 20
England and Wales	377	<i>153</i>	<i>108</i>	<i>75</i>	21	8	20	19	35	33
Scotland	133	<i>37</i>	<i>23</i>	<i>20</i>	9	10	7	33	<i>54</i>	14
Ireland	16	<i>16</i>	<i>10</i>	2	—	—	—	2	1	4
Total	526	<i>206</i>	<i>141</i>	<i>97</i>	30	18	27	54	90	51

(Cumberland, Northumberland and Durham are included with the Scottish returns)

Summer holidays resulted in a large number of counts being missed in August and September. This will always be the case, it is feared, but the returns which do come in carry much useful information on the numbers of juveniles present, and may later be used in a survey of breeding habitats. From October onwards a high proportion of waters were covered except in Scotland in January and February when appalling weather and road conditions prevented many counters from reaching isolated places.

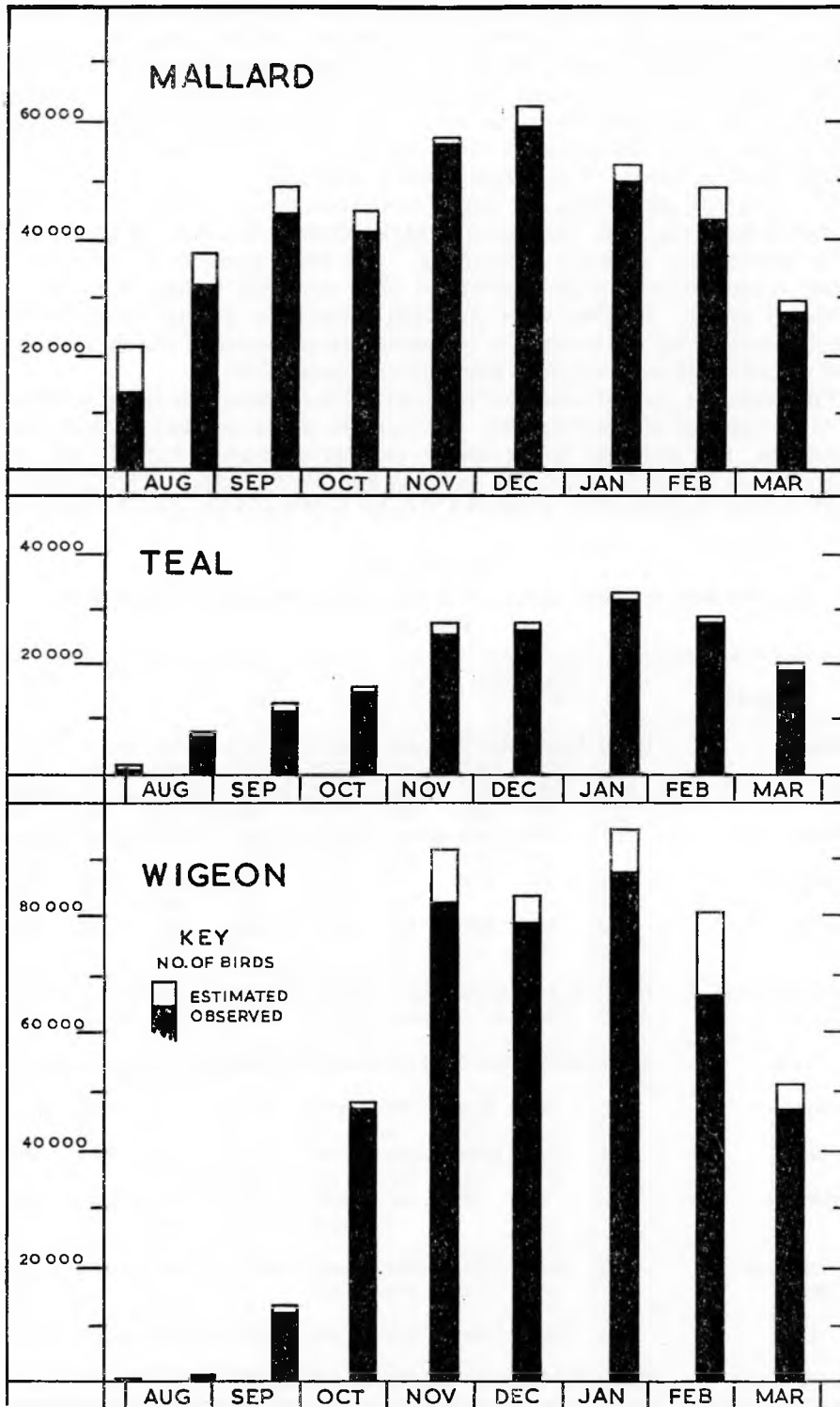
In the diagrams, recording the numbers of the eight selected species, which follow, the counts for 24 October, 21 November and 19 December may be regarded as reliable, unless the size of individual interpolations is too large to be acceptable. On 23 January the numbers of waters uncounted in Scotland was high, but over the country as a whole not too high. This unfortunately was not so on 20 February when an average of one water in six of the national sample went unvisited. The March count is adequate.

The diagrams themselves are largely self-explanatory. The black portions of each column represent the number of birds actually observed, and are reliable data, subject only to errors in counting. The white portions at the head of many columns represent the numbers of birds estimated to have been on the unvisited waters. In some cases they alter slightly the pattern shown by the black columns, but are thought to represent a truer picture of the fluctuations, and to make adjoining columns more closely comparable.

For those who prefer to compare statistics Table III shows the actual numbers of birds observed and interpolated; for those to whom columns of figures are anathema, the diagrams which follow are recommended, but all may be interested in the grand totals for dabbling and diving ducks. The figures in light type are the numbers interpolated, those in bold type were actually observed.

TABLE III
The Numbers of Eight Species of Wildfowl Recorded in the British Isles
1954-55

1954-55	Aug. 1	Aug. 29	Sept. 26	Oct. 24	Nov. 21	Dec. 19	Jan. 23	Feb. 20	Mar. 20
Mallard	14,391 7095	32,061 5937	44,118 5163	41,861 3211	56,235 1219	59,067 3635	49,715 2900	43,733 4645	27,024 1825
Teal	1230 377	6699 445	11,768 664	14,675 602	24,935 1290	25,370 993	30,781 1185	27,145 625	18,607 745
Wigeon	257 3	990 20	11,688 417	47,501 577	82,745 9185	79,355 4045	88,279 6495	66,605 13,575	46,910 4665
Pintail	8 10	63 —	157 —	749 12	1071 25	1932 150	2602 100	4455 40	4172 30
Shoveler	258 220	425 114	569 83	897 81	1201 5	1259 100	1096 127	1800 9	1696 32
Dabbling Ducks ..	16,144 7705	40,238 6516	68,300 6327	105,683 4483	166,187 11,724	166,983 8923	172,473 10,807	143,738 18,894	98,409 7297
Total	23,849	46,754	74,627	110,166	177,911	175,906	183,280	162,632	105,706
Pochard	575 15	755 2	962 109	2705 45	5579 35	7839 49	6376 55	4008 45	3445 65
Tufted	1276 615	2191 497	2260 265	3478 550	7307 162	9222 88	7463 250	7862 295	7602 296
Goldeneye	4 —	45 —	62 —	446 5	1444 130	1150 8	1105 140	1004 184	1358 41
Diving and Sea Ducks	1855 630	2991 499	3284 374	6629 600	14,330 327	18,211 145	14,944 445	12,874 524	12,405 402
Total	2485	3490	3658	7229	14,657	18,356	15,389	13,398	12,807
GRAND TOTAL ..	26,334	50,244	78,285	117,395	192,568	194,262	198,669	176,030	118,513



THE DABBLING DUCKS

MALLARD (*Anas platyrhynchos*)

The pattern of the seasonal fluctuation in the numbers of Mallard recorded in the British Isles which is shown in the upper of the diagrams opposite coincides closely with the results of other seasons. The late November-early December peak of previous years is present, and the subsidiary peak in early October is also noticeable. The count at this date in 1954-55 is admittedly unreliable owing to the high number of interpolations, but it will be seen that on 26 September more birds were seen on the 429 waters covered than on the 496 visited on 24 October.

The pattern of the results from the various areas, which have been incorporated in the diagram, is similar to those of previous years. In Scotland there was a November peak of c. 15,000, but the subsidiary peak in February, apparent in other years, was, if present, masked by bad weather and poor cover. In England and Wales a peak of over 46,500 was recorded on 19 December, about 6000 more than on the preceding and following dates. In Ireland, in spite of a smaller sample than usual, a marked peak of 1800 birds was once more recorded in October.

TEAL (*Anas crecca*)

The numbers of Teal recorded in the Wildfowl Counts have not been published hitherto, but the results of the 1954-55 season are of the same order as those in previous seasons. It will be seen that the peak total of just over 30,000 amounts to about half that of the Mallard and to a third of that of the Wigeon. These proportions do not necessarily indicate the relative sizes of the populations of the three species, but they may do so. The numbers of Mallard and Wigeon are spread fairly evenly over the country, but the Teal population seems to be concentrated in the south and Midlands of England. Less than one-tenth of the Teal were observed in Scotland and north England, compared with a quarter of the Mallard and Wigeon.

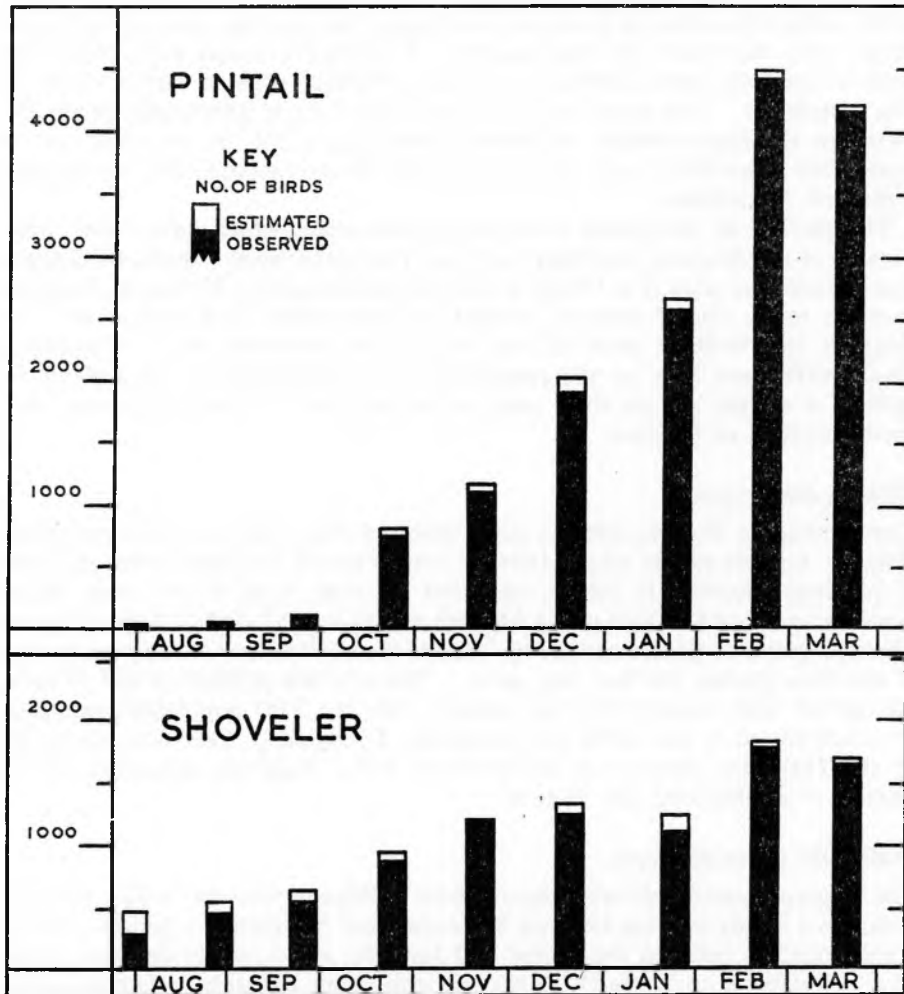
WIGEON (*Anas penelope*)

The diagram opposite showing the numbers of Wigeon recorded during 1954-55 indicates a steady increase between September and November, a period of fairly stable numbers between November and January, and a steady decrease thereafter. Reference to Table IV shows that this result conceals variations in the

TABLE IV
Wigeon in the British Isles, 1954-55

	Sept. 26	Oct. 24	Nov. 21	Dec. 19	Jan. 23	Feb. 20	Mar. 20
England and Wales ..	3136	13,448	49,994	52,647	66,428	53,842	40,613
Scotland	3926	23,426	25,819	19,768	19,200	18,883	8331
Ireland	5043	11,204	16,117	10,985	9146	7455	2631
Total	12,105	48,078	91,930	83,400	94,774	80,180	51,575

records from different parts of the country. In it are given the numbers counted in England and Wales, Scotland and Ireland. Figures in italics contain an unduly high proportion of estimates, and may be unreliable.



It will be seen that in England and Wales there was a sharp increase between October and November, no real change between November and December, but that a further marked increase took place in January. In Scotland the peak level was reached early, in October, and thereafter there was a slow decrease until February. In Ireland the peak is most noticeable in November. It is thought that the Irish figures and their effect on the national total must be treated with reserve. The cover there is limited, being confined mainly to the north-east, and the November peak may represent no more than an influx of birds, concentrated at the time of arrival, but later dispersed over the remainder of the country into uncounted areas.

PINTAIL (*Anas acuta*)

The diagram of the numbers of Pintail observed in the British Isles in 1954-55 is of great interest in that it indicates something of the habits of a bird of whose movements comparatively little is known. The majority of the winter population is thought to be concentrated on less than 25 favourite resorts of which possibly the largest, in the N.W. Midlands, is not counted regularly. It is known, however, from sporadic reports that this flock is normally several thousand strong. In past years large numbers have been recorded as early as mid-October, and it will be appreciated that the inclusion of records for this flock might materially alter the pattern presented in the diagram.

In Table V are shown the numbers of Pintail observed in various parts of the country, and in the left-hand column, the number of localities in which more than 100 birds at the peak were recorded.

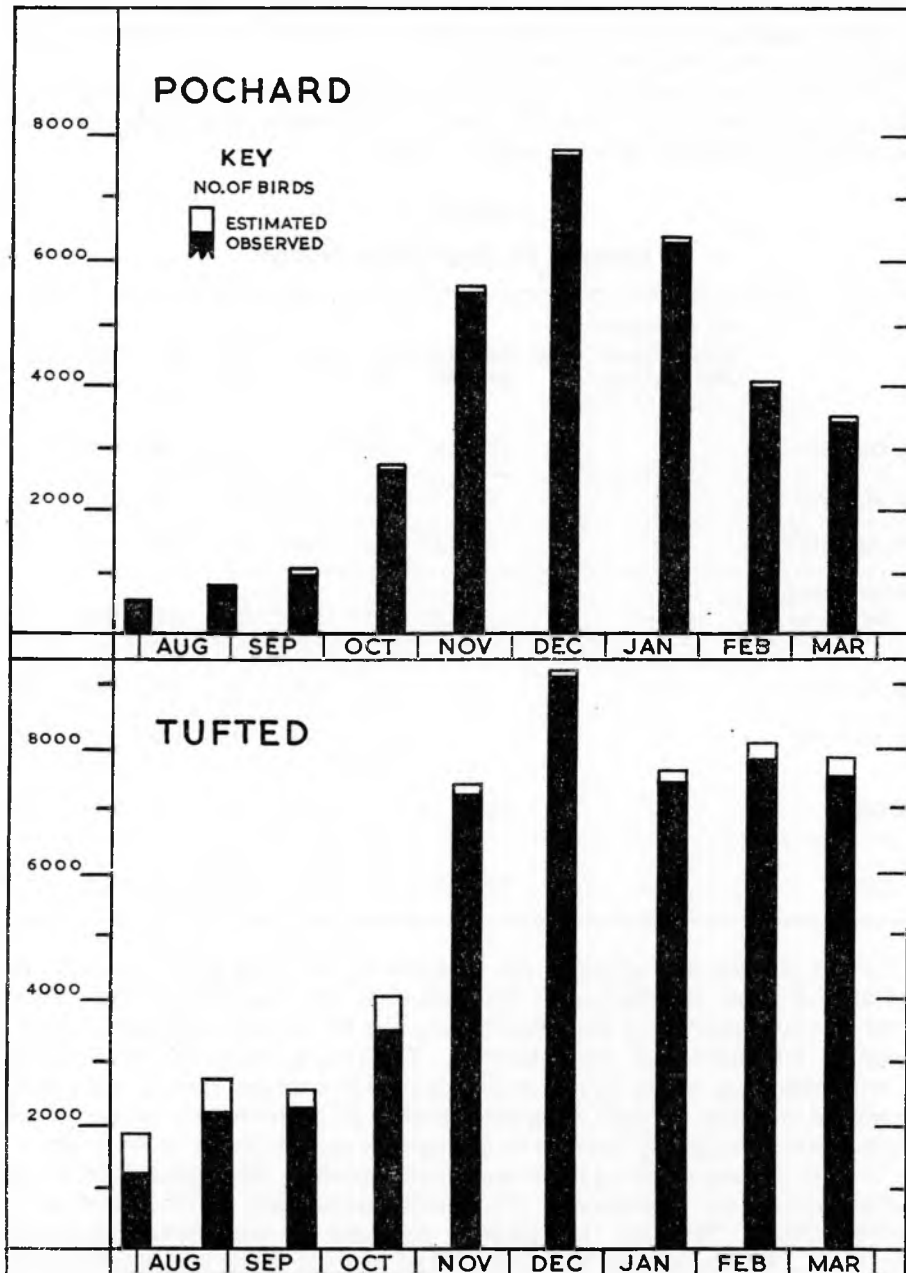
TABLE V
Pintail in the British Isles, 1954-55

	No. of Waters carrying more than 100 birds	Aug. 1	Aug. 29	Sept. 26	Oct. 24	Nov. 21	Dec. 19	Jan. 23	Feb. 20	Mar. 20
S. England ..	9	12	21	63	280	367	789	1345	609	401
E. Midlands ..	2	6	2	7	19	95	551	409	2918	3302
W. Midlands	2	—	—	43	143	196	471	305	284	144
E. Scotland and the Border ..	1	—	—	35	111	116	105	200	142	83
W. Scotland ..	2	—	—	—	15	104	10	260	305	145
N. Scotland ..	1	—	—	4	90	44	91	100	120	92
Ireland ..	1	—	40	5	104	174	65	90	117	35
Total ..	18	18	63	157	762	1096	2082	2709	4495	4202

It will be seen that although the numbers of birds are generally small, the number of places on which more than 100 birds were recorded is high. Moreover, on three-quarters of the inland waters, and two-thirds of the coastal waters counted, no Pintail at all were observed. This stresses the point that to obtain a true indication of the status of Pintail in this country, records are needed from the majority of their favourite resorts. If observers are aware of any such places, it might be possible to arrange for special counts to be made.

In spite of these rather cautious comments, however, the results of the counts follow closely the summary of the Pintail's movements in the *Handbook of British Birds*: 'Numbers of passage migrants in most years apparently small. . . . Return passage very well marked in some years, mid-March to end

of April . . .’ They differ only in one respect from the suggestion in the Handbook that Pintail occur inland ‘fairly often, but irregularly and in very small numbers.’ The majority of the birds recorded in the East Midlands area in February and March were on freshwater flooding in the Fenland of Cambridgeshire. I. C. T. Nisbet, the Wildfowl Count Organiser, states in *British Birds*, 47, p. 396, that this has now been a regular habit since 1946–47.



SHOVELER (*Anas clypeata*)

The *Handbook of British Birds* suggests that the British population of Shovelers is composed of a complex combination of summer residents, passage migrants and winter visitors. British breeding birds are summer residents arriving with passage migrants in late February and March and leaving in August and September. Some emigrate, others disperse within Britain. Passage migrants and winter visitors arrive on the East coast, probably from Holland, Denmark and N. Germany from mid-September to November and some pass to Ireland. The return passage in spring is much better marked than the autumn passage, and takes place between the end of February and the end of April, but mostly in March.

Such an account could explain almost any fluctuations shown in the results of the wildfowl counts, and it is evident that a specialised study of the species is needed if further detailed information is to be forthcoming.

THE DIVING AND SEA DUCKS

POCHARD (*Aythya ferina*) and **TUFTED** (*Aythya fuligula*)

One of the most interesting points brought out by the Wildfowl Counts results is the low numbers of diving ducks observed, compared with the numbers of dabbling ducks. Of the eight species under review Tufted are, second to Mallard, the duck most frequently recorded on inland waters and Pochard are the fourth most widely distributed, but they are also the species least often seen on salt water, where the big concentrations of dabbling ducks are found. Moreover, flocks of over 500 of both Pochard and Tufted are rare, and the number of waters carrying over 100 birds was found to be only 19 for Pochard and 30 for Tufted.

It will be seen that for both species a peak was reached in mid-December after a swift increase from the summer level which may reasonably be supposed to consist largely of breeding birds. After December a decrease in numbers is indicated but care is needed in interpreting this trend. Diving ducks, being dependent on deep open water for their food supply, are more vulnerable to frost conditions than the majority of the dabbling ducks, which can often find adequate food in shallow fast-flowing streams or by grazing, and which may be content to roost on the ice. In the cold weather of January and February 1955, therefore, the apparent decrease in numbers of Pochard and Tufted might represent no more than a concentration of the birds onto open waters not included in the cover of the counts. In addition estimates of the numbers on unvisited waters, of which there were many at this time owing to snow and icebound roads, become fraught with difficulty, and hinge on the probable extent of the ice on the waters concerned.

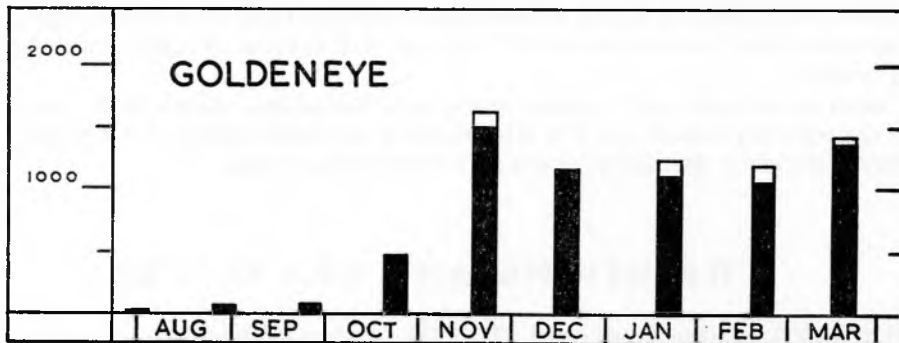
By March, however, conditions were normal and the final count which was almost as reliable as that of 19 December, provides a comparison of the populations observed in mid-winter and early spring.

GOLDENEYE (*Bucephala clangula*)

The numbers of Goldeneye recorded in the Wildfowl Counts are the smallest of the eight species considered here, but they are not the species most seldom seen. At one time or another during the 1954-55 counting season Goldeneye

were recorded on just over 40% of both inland and coastal waters, being more widely distributed than Pintail and Shoveler inland and than Pintail, Shoveler, Pochard and Tufted on the coast.

It will be seen that numbers increased sharply in November and remained more or less constant throughout the remainder of the winter. The majority of the October birds were recorded in Scotland, and a peak of over 800 was reached there in November. A steady decrease in Scotland after November was balanced



by a steady increase in England and Wales which reached a peak of over 900 in March. In Ireland the trend to a peak in February was interrupted only by a sudden increase in November due to the record of 100 birds in one locality. As this increase was not reflected on any of the other Irish waters counted, it is thought that it may have been no more than a fortuitous concentration without real significance.

THE DISTRIBUTION OF EIGHT SPECIES OF WILDFOWL IN THE BRITISH ISLES

Whilst the figures in the preceding section were being collated an aspect of the secondary uses to which the Wildfowl Counts can be put was disclosed. A record was kept of the numbers of coastal and inland waters on which each of the eight species were observed on one or more of the count dates of the 1954-55 season, with the idea of discovering not only how many ducks were seen, but also how often. The results are interesting, but must be regarded as preliminary, as the data has been used only in its most general form. A water has been recorded as 'occupied' whether it carried one bird on one occasion, or some hundreds throughout the season. Nor has any attempt been made at this stage to classify the types of habitat on which the presence or absence of birds was recorded. This will follow later, but the preliminary results in Table VI, which shows the percentage of coastal and inland waters 'occupied' by each of the eight species, may give an idea of the relative frequency with which they are likely to be seen. The results are based on the counts from the 136 coastal and 374 inland waters covered in England, Scotland and Wales. The Irish returns have not been included in this study as it was felt that the sample was too small to be representative.

TABLE VI

The percentage of a Sample of 136 Coastal and 374 Inland Waters Occupied by Eight Species of Wildfowl on One or More Count Dates during 1954-55

			Coastal	Inland				Coastal	Inland
Mallard	..	..	96.8	97.0	Shoveler	..	..	37.3	34.7
Teal	..	..	82.5	56.2	Pochard	..	..	12.7	59.9
Wigeon	..	..	94.4	69.5	Tufted	..	..	30.2	74.3
Pintail	..	..	38.8	22.5	Goldeneye	..	..	41.2	42.5

For southern England this study has been carried a step further, and the percentage of coastal and inland waters occupied on each of the count dates has been determined. Based on a sample of 71 coastal and 131 inland waters drawn from the area lying south of the line Lowestoft—Luton—Stafford—Swansea, the results are related to the number of birds recorded in the area. The three early counts have been omitted as so many waters were not visited, but the remaining counts are considered to be reliable.

From Table VII, in which these figures are set out, information can be derived on the movements and build-up of the winter populations in the southern counties. In many cases the information is no more than confirmation of what was already known or suspected. For example, the March dispersal of Mallard is well shown by the sharply falling numbers and the increase in the number of inland waters occupied, and the spread of diving ducks to the coast in January is to be expected as a result of frost inland. Even the fact that these simple items of common knowledge can be expressed in numerical form is important.

TABLE VII

The Numbers and Distribution of Eight Species of Wildfowl on a Sample of 202 Waters in Southern England

		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Some- time During Season
Southern England 1954-55 ..		24	21	19	23	20	20	
MALLARD	Total Numbers	17,078	17,046	18,033	18,799	16,392	8266	
	Percentage of Waters Occupied	{ Coast 86	{ Coast 72	{ Coast 68	{ Coast 71	{ Coast 74	{ Coast 74	96
TEAL	Total Numbers	5543	11,737	12,829	16,424	11,442	6528	
	Percentage of Waters Occupied	{ Coast 40	{ Coast 61	{ Coast 56	{ Coast 70	{ Coast 70	{ Coast 61	90
WIGEON	Total Numbers	6541	18,998	27,140	38,127	23,914	11,292	
	Percentage of Waters Occupied	{ Coast 55	{ Coast 66	{ Coast 69	{ Coast 82	{ Coast 77	{ Coast 76	91
PINTAIL	Total Numbers	280	367	789	1345	609	401	
	Percentage of Waters Occupied	{ Coast 8	{ Coast 14	{ Coast 13	{ Coast 24	{ Coast 23	{ Coast 21	45
		{ Inland 3	{ Inland 5	{ Inland 3	{ Inland 15	{ Inland 15	{ Inland 5	25

TABLE VII—*continued*

		Oct. 24	Nov. 21	Dec. 19	Jan. 23	Feb. 20	Mar. 20	Some- time During Season
Southern England 1954-55 ..								
SHOVELER	Total Numbers	499	570	916	880	1230	964	
	Percentage of Waters Occupied							
	{ Coast	6	20	18	23	21	20	43
	{ Inland	12	16	17	19	18	18	34
POCHARD	Total Numbers	1336	4147	5124	4869	2359	1742	
	Percentage of Waters Occupied							
	{ Coast	1	3	6	11	14	7	15
	{ Inland	24	44	45	34	40	40	64
TUFTED	Total Numbers	1848	4660	6065	5636	5726	1544	
	Percentage of Waters Occupied							
	{ Coast	3	6	7	21	14	15	29
	{ Inland	44	54	61	52	53	69	81
GOLDENEYE	Total Numbers	13	329	249	514	432	512	
	Percentage of Waters Occupied							
	{ Coast	—	6	6	14	13	13	25
	{ Inland	3	13	8	11	10	10	24

More interesting, though, is that in some cases the inferences to be drawn from the figures are not entirely what one would expect. It is surprising to find that in most months Shovelers were more likely to be seen on coastal waters than inland, that early in the season Goldeneyes are more common inland, and only later in the year tend towards the coast; and that Pintails, like Teal, remain spread over as large a number of waters in February as at any time in the season despite a big reduction in numbers. The extent of the spread of Wigeon inland may come as a surprise, and it is interesting to note that the percentage of inland and coastal waters occupied by them fluctuates in much the same proportion from month to month.

More important than any of these inferences, though, is the evidence that at no one time are all the resorts of a species in use. In the right-hand column of Table VII are shown the percentage of the waters counted which were occupied at one time or another during the season. It will be seen that in no case, except in that of Pochard on the coast, do the percentage of waters in use at any one date come near to the percentages occupied sometime during the season. This might suggest that at certain times of the year one type of habitat is more popular than another, but at the moment there is no means of demonstrating this, although in due course, 'Operation Waterlog,' the proposed study of the ecology of wildfowl habitats, will, it is hoped, provide the answer to this problem.

