

## Winter wildfowl counts in south-east Europe and western Turkey

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### Introduction

In the last decade the International Wildfowl Research Bureau began special efforts to make wildfowl counts in the circum-Mediterranean area. It was known that large numbers of Anatidae were wintering in this area and that rapid changes were taking place in their habitats. The future of a large proportion of the European migratory wildfowl populations seemed, therefore, to depend on the way the situation around the Mediterranean developed.

With very few ornithologists, amateur or professional, residing in these countries, and in view of the extent of many of the wetlands, it would obviously not be possible to organise at once the monthly counts practised in several west European countries over more than twenty years. So it was thought desirable to start by carrying out one annual mid-winter count, at a time when the wildfowl populations are most stationary. Mid-January was thought to be the best time (though the possibility of cold-weather movements could not be ruled out), during the fortnight around the nearest Sunday to the 15th January.

Although fragmentary data over several years are available from some of the countries, it was not until the winter of 1966-67 that regular missions were undertaken, to Rumania, Greece and Turkey. This work has been carried out mainly by a small but increasing number of reliable ornithologists, experienced at estimating numbers of wildfowl, whose deep interest has assured fairly regular visits. These missions have sometimes only been made possible by special grants but not a small contribution has been made by counters themselves.

The area under review lies between latitudes 36°N. and 46°N. and between longitudes 14°E. and 36°E., is bordered in the north by the Soviet Union, Hungary and Austria, and in the south, east and west by the Mediterranean, Black and Adriatic Seas respectively. Only the western half of Turkey, with its abundance of lakes, and deltas is reviewed, the few lakes in the east being situated at high altitudes and usually frozen over for two or three months of the year.

Regarding Albania it is unfortunate that no data are available, either on the status of the wetlands or the wildfowl visiting

them. Although the interior of the country is for the greater part mountainous, it would appear from maps that the deltas and wetlands along the coast might well be suitable to important numbers of ducks and geese, particularly during hard winters.

The time appears ripe for the results so far obtained to be made available in the form of an interim report. This paper then, is based on an accumulation of the data gathered by 27 missions, mainly during the period of the mid-winter counts, a full list of these being given at the end of this paper.

Although we only attempt to reveal the distribution and approximate numbers of the species of wildfowl visiting the area under study, a mass of information has also been collected on other aquatic species: grebes, herons, waders, and also on birds of prey.

Each winter new findings come to light concerning the numbers, distribution and movements of the Anatidae through these countries, and new wetlands are sometimes discovered. Thus in Greece in January 1970 a relatively small area comprising four lakes, the existence of which was seemingly unknown to ornithologists, revealed a total of 266,000 Anatidae and Coots. Often, because of the absence of roads and the necessity to have a vehicle capable of crossing difficult terrain, certain areas might be counted effectively one year but not another.

In view of this the data drawn up will be subjected to many corrections in future years. It does, however, serve to show the important rôle which the wetlands in these countries play for these migratory birds who know no frontiers, and whose future is an international responsibility.

### Rumania

Although there are several wetlands situated along the River Danube which are of importance to wildfowl either on passage or for breeding, these are generally frozen over during the winter. This leaves, then, the delta of the Danube and the complex of lakes to the south (Razelm, Sinoie), comprising a total surface area of some 435,000 ha. Not only is this the most important wetland area on the Balkan Peninsula but one of the most, if not the most important in the whole of Europe.

Situated roughly between latitudes 44°N. and 48°N. and longitudes 21°E. and 30°E., Rumania is subjected to a moderate continental climate, the summers being hot and the winters generally

cold. However, influence from the Black Sea over the delta and coastal regions is very marked, the winters being less severe here than throughout the rest of the country. There are strong winds and it is often cloudy or foggy. Although the greater part of this region may be completely frozen over for certain periods each winter, the cold spells, though sometimes severe, are not generally of long duration. At such times there is no doubt an exodus of wildfowl, as can be seen from the figures below, but the majority of birds can rest and feed on the sea.

The delta proper covers some 5,640 sq. km., of which 4,350 sq. km. are on Rumanian territory, the rest belonging to the Soviet Union. After the delta of the Volga it is the largest in Europe, 87% being water. The dominant vegetation over the major part of the delta area is reed *Phragmites communis* intermingled with common sallow *Salix cinerea*. These extensive reed-forests are interspersed with open stretches of water, many of them taking on the form of lakes, some, like Lake Rosu, being as much as 9 km. long and 4 km. wide. Being generally more than a metre deep they do not attract many surface-feeding ducks, but are the stronghold of Pochard *Aythya ferina* in particular.

To the south of the delta a series of lakes extends as far as the Bulgarian border. All of these are brackish or salty, the complex Razelm/Sinoie being in direct contact with the sea. It is in this latter complex and also around the island of Sahalin in particular, that most of the surface-feeding ducks are to be found. Lake Techirghiol has a salt content of between 80 and 110 g./l. and even during the coldest spells never freezes. This lake is important for wintering Shelduck *Tadorna tadorna* and White-headed Duck *Oxyura leucocephala*. Having a depth of between one and ten metres, it is extremely rich in Arthropoda and Crustacea, and the density of brine shrimps *Artemia salina* may reach around 100,000 per cubic metre, an important source of food which is possibly taken by the Shelducks.

Along practically the whole of the coastline there exists a shelf where the sea is little deeper than a metre. About 150 metres wide over the major part, this shelf broadens out to at least 500 metres in the whole of the delta and to as much as a kilometre around the island of Sahalin. This condition gives rise to a proliferation of eel grass *Zostera marina* and about 150 species of algae, of which the commonest are: *Enteromorpha linza*,

*Laurenzia corcoronopus*, *Ceramium elegans*, *Ulva lactuca*, etc. This abundant flora is without doubt the principal food of the wildfowl during severe cold spells.

It is understandable that such a vast region, much of which is difficult of access, should have remained little explored by the ornithologist, particularly during the winter. The first indications of the numbers and species of wildfowl wintering here date back to 1958-59. The following is an extract from the report by J. Vielliard, made available by M. Talpeanu.

1958-59: 940,000 birds in the delta and lagoons in November. During the first two weeks of December with a light frost, 530,000 in the delta and the lagoons and 1,000,000 on the sea. In January 159,000 in the lagoons, the delta being frozen. In the last two weeks of February 250,000 on the sea, the delta and the lagoons being frozen.

1959-60: No permanent frost; total census (delta, lagoons and sea) 133,500 in October, 128,700 in November, 119,400 in December, 103,900 in January, 140,800 in February and 320,100 in March (of which 255,600 in the lagoons).

1960-61: Frost in January; total census 219,500 in October, 229,500 in November, 693,000 in December, 305,500 in January, 828,000 in February (of which 610,500 on the sea) and 324,500 in March.

Ranked according to their numbers, the most common species are: (1) Teal *Anas crecca*, (2) Mallard *Anas platyrhynchos*, (3) White-fronted Goose *Anser albifrons*, (4) Coot *Fulica atra*. Red-crested Pochard *Netta rufina* stay the whole year, whilst Shelduck and White-headed Ducks have not been mentioned.

We can see that many ducks do retire to the sea during severe weather, as in the winter of 1958-59. In 1959-60, however, with no permanent frost, the total of Anatidae on the sea is much reduced.

In 1967 Vielliard and Talpeanu saw no more than a few hundreds of wildfowl, but their visit was done on foot and by car and they only reached the lakes to the south of the delta. Moreover, the count coincided with a spell of severe weather (15th-22nd January) and the masses of wildfowl were presumably out on the sea.

In January 1968 Hoekstra and Johnson also ran into similar unfavourable weather conditions, not even permitting the eastern part of the country to be reached. The missions of the autumn and winter of 1968-69, however, met with more success. During much of November and December

Hoekstra and Hafner, with the assistance of the Commission for the Preservation of Natural Monuments in Rumania, were able to cover the greater part of this region by car and by boat. Also two flights were made on 9th and 13th January 1969, when practically the whole of the delta area and complex of lakes was covered. A cold spell had just begun and many of the lakes had started to freeze. By the 13th there was very little open water remaining and this influenced the distribution of the Anatidae (Figure 1). However, a thaw set in the following day.

The results obtained give a rather different view from that gained from previous missions and the most abundant wintering species were diving ducks. Full data are given in Table I. There is a striking difference in the numbers of Pochard *Aythya ferina* and Red-crested Pochard seen in past winters and the vast quantities recorded in 1968-69. The total of Pochard seen in November/December 1968 approached a million, and during the two flights in January 1969, 308,000 and 136,000 respectively. A total of 30,000 Red-crested Pochard was seen in November/December and also in January. Only about 12,000 Tufted Duck *Aythya fuligula* were seen in November/December but no less than 180,000 were counted in January. It is possible, however, that this species was well represented in the large numbers of unidentified ducks seen in December.

These enormous differences from the results from previous missions might be explained by the fact that the principal concentrations of these species are to be found in those places difficult of access and which have not been visited in the past: Lake Rosu within the delta, the eastern part of the complex Razelm/Sinoie, and, when the weather is severe, on the sea. It must not be forgotten that there are no roads in the delta.

Only by further counts can we find out if these figures represent an average winter population or if there is some change taking place. It is difficult, however, to explain the absence of the Teal in January, which was previously considered to be the most abundant wintering duck. Of the 150,000 seen in November/December, very few remained in January, 1,340 on 9th and 90 on 13th. The only surface-feeder which was seen in large numbers in January was the Mallard. This species is also abundant on migration in Rumania; about 200,000 were seen in November/December and about 100,000 in January.

Important passage has also been noticed

in November/December of the Pintail *Anas acuta* 10,000, Wigeon *Anas penelope* 13,000 and Shoveler *Anas clypeata* 40,000, but very few birds of these three species stay to winter.

It is clear then that this area is of prime importance as a wintering ground for diving ducks, and as a feeding and resting place for the masses of surface-feeders originating from the Soviet Union and

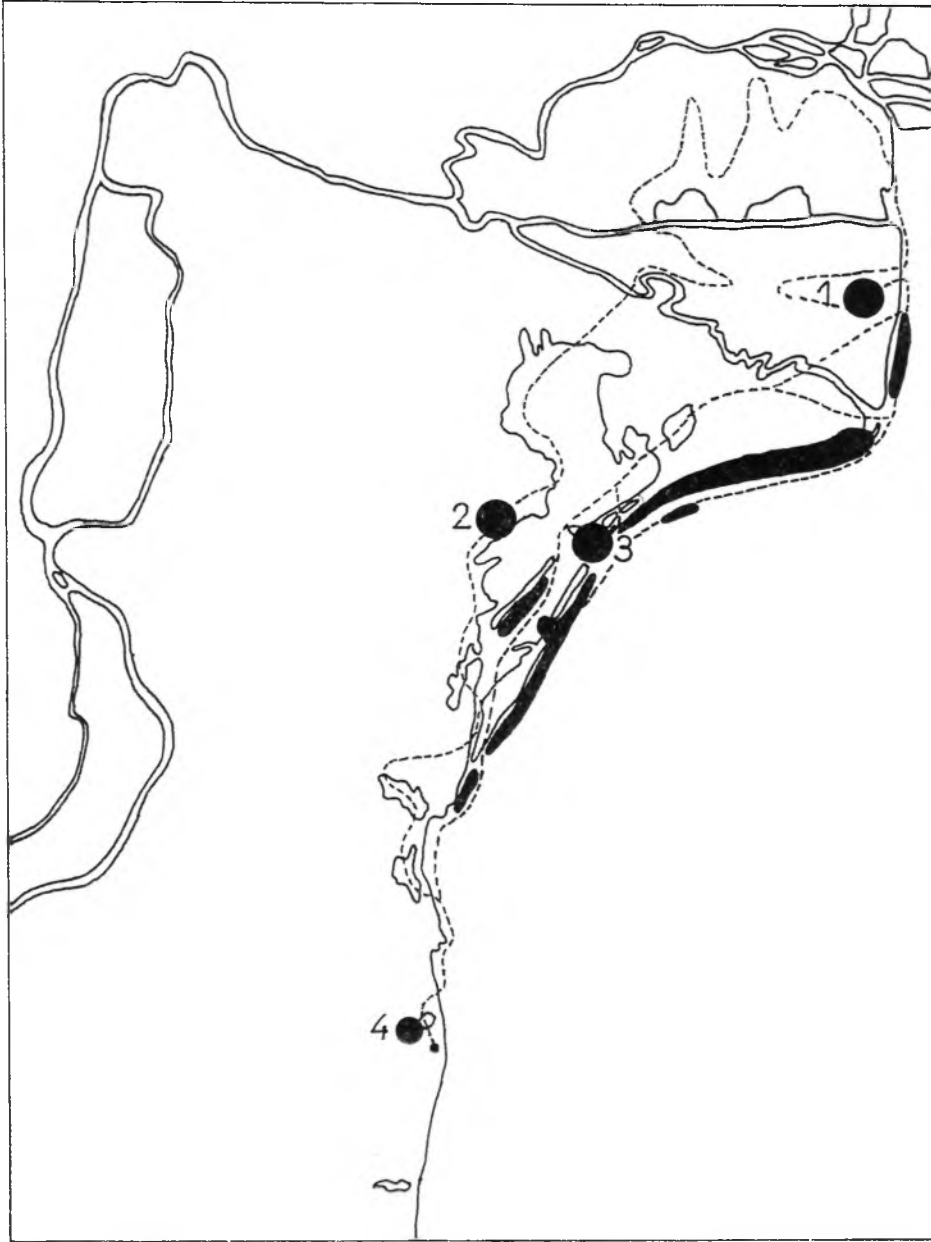


Figure 1. The most important concentrations of wildfowl in the Danube delta and the complex of lakes to the south in January 1969. ----- = itinerary of two flights 9th and 13th January 1969. (1) Lake Rosu; (2) cultivated plains of the Dobrudja; (3) sector Bisericuta; (4) Lake Techerghiol; other black areas are coastal concentrations of Mallard and diving ducks.

**Table I. The numbers of Anatidae and Coots counted in the Danube delta region winter 1968-69.** The November/December counts were made from the ground or by boat, whilst in January two flights were made over the same area.

<i>Species</i>	<i>Ground counts 12th Nov. to 19th Dec.</i>	<i>Flight of 9th Jan. (still much open water)</i>	<i>Flight of 13th Jan. (effects of cold spell)</i>
Mute Swan	750+	2,850	1,850
Whooper Swan	300+	2,600	2,900
Bean Goose	28	—	—
White-fronted Goose	500,000	20,000	40,000
Greylag Goose	2,000	760	2,330
Red-breasted Goose	25,000	—	2,000
Ruddy Shelduck	50	—	—
Shelduck	1,500	1,200+	700
Marbled Teal	1	—	—
Pintail	14,000	46	76
Teal	150,000	1,340	90
Mallard	200,000	105,500	97,000
Gadwall	2,000	60	—
Wigeon	13,000	20	—
Shoveler	40,000	2,000	450
Red-crested Pochard	30,000	32,420	2,000
Pochard	970,000	308,790	136,000
Ferruginous Duck	13,000	1,040	15
Tufted Duck	12,000	182,000	175,250
Goldeneye	500	140+	80
Smew	50	30+	90
Red-breasted Merganser	400	570	220
Goosander	12	—	1
White-headed Duck	100+	20+	—
Unidentified ducks	270,000	50,000	20,000
Coot	90,000	22,000	3,250

wintering in the Mediterranean basin.

The coastal lakes south of the delta give place to the fertile rolling plains of the Dobrogea. These plains form the granary of Rumania and Bulgaria and much of the wheat grown there is winter-wheat, which is just sprouting when the huge flocks of geese move south in the autumn.

A small number of Greylag Geese *Anser anser* breed in the delta. Previous to 1968-69, however, they were not recorded as wintering, yet a flock of 2,300 was present in January. Even more striking data have been gathered for the White-fronted Geese and Red-breasted Geese *Branta ruficollis*. In December 1968 one flock seen between the villages of Istria and Sinoie was estimated at 500,000 Whitefronts and 25,000 Red-breasts, of which 50,000 Whitefronts and 2,000 Redbreasts were still present in January. This large number of geese is quite outstanding for any area. Where the bulk of the geese wintered is uncertain. It is unlikely that they moved east to the Caspian; Bulgaria has many suitable areas.

The Red-breasted Goose, having its main wintering grounds to the south of

the Caspian Sea, usually passes to the east of the Black Sea (Sterbetz and Szijj 1968). However, its presence in Rumania has been known since 1910, when the first specimen was collected. From then up to the 1940's its occurrence was only sporadic. Since then Talpeanu (1963) describes it as wintering in tens or hundreds between October and March. Over 25,000 were counted in the Soviet Union in January 1967, but only 13,300 in January 1968 (Isakov 1968). The world population was thought to be between 30,000 and 50,000 (Uspenski 1965). A change may have taken, or is taking, place in the migration routes and wintering grounds of this species. Such a change might be brought about by a habitat loss further east. The presence of at least several thousands in Rumania was confirmed again in December 1969 (see pp. 37-41). Closer studies of this beautiful species are clearly needed.

#### Yugoslavia

There is no scarcity of wetlands in Yugoslavia and many of them are rich in breeding pelicans, herons, ducks and

geese. The extensive lowlands along the valleys of the Sava, Danube and Tisza, with an abundance of marshes, provide for the requirements of many wildfowl on spring and autumn migration. Subjected as it is to a typically continental climate, as well as the wetlands, excepting those bordering the Adriatic or in the extreme south, stay free of ice during a normal winter.

Most geese are driven south in late autumn by the snow, which often falls heavily. When driven by wind, even during periods of heavy snowfall, tracts of cereal fields may sometimes remain exposed, or the covering may be thin enough to allow the geese to feed. As compared with the Dobrogea, however, snowfall in the north of Yugoslavia is not always accompanied by moderate or strong winds, at such times the cover is uniform. A slight thaw during the day will melt the surface of the snow, this freezes again at night, resulting in an impermeable covering of ice. Under such conditions geese cannot feed and are forced to move to other areas, as in Bosnia and Serbia in December 1969.

At such times it might be presumed that most birds cross the mountains south of the river Sava to winter along the Adriatic in Yugoslavia, Albania and Greece, while some may cross the sea to reach the Manfredonia region in south-eastern Italy. This might also be the route taken by the Greylags which winter regularly in Tunisia and NE. Algeria.

Prior to the mission of December 1969 few ornithologists seem to have counted wildfowl on autumn migration through Yugoslavia. The most abundant species is almost certainly the Whitefront, probably followed by the Bean Goose *Anser fabalis*. Greylags would also be involved and there might well be small numbers of Lesser White-fronted Geese *Anser erythropus* and Red-breasted Geese as well.

Before reaching Yugoslavia in autumn these birds probably pass through the famed Hortobagy on the Hungarian Puszta. This area, bordering along the river Tisza, was in former times host to hundreds of thousands of geese. More recently, however, because of the transformation of the Puszta, an important decrease has taken place in the numbers of geese passing through (Philippona 1967). This is not explained by a decrease of the population on the breeding grounds, for those wintering in western Europe have not shown such a decrease. The explanation probably lies in a change of the migration route. An important in-

crease was noted in Austria (Neusiedler See) between 1950 and 1962, but in more recent times these numbers have fallen back again. It is quite possible, as Philippona suggests, that much of this population now passes through Rumania, explaining the huge concentrations there in autumn 1968.

In view of this it is possible that the numbers of geese passing through Yugoslavia has dropped in recent times. In December 1969 the mission found only 500 White-fronted Geese in the north and only 15 in the south in the Skutari region on the Albanian border. This is said to be a wintering area, but at the time of our visit the lake was in flood and the goose feeding grounds inundated.

Ducks and Coots winter on the wetlands along the Adriatic, which probably seldom freeze, but the numbers during our visit did not exceed 25,000 birds. Several thousand Ferruginous Duck *Aythya nyroca* may be involved, though probably only a few hundred winter, in the south. Goldeneye *Bucephala clangula* exceed a thousand on spring migration.

### Bulgaria

Lying in the path of the wave of migrants along the west of the Black Sea and situated between Rumania and Greece, two countries very rich in wintering wildfowl, it is evident that Bulgaria must be traversed by many thousands of ducks and geese each year. However, the extent to which the wetlands and goose-grounds in this country act as host to these birds in autumn and winter seems for a long time to have passed unnoticed.

To understand the climatology of the country we must look at its geographical situation. Elongated in an east-west direction, it is divided roughly along the 43°N. parallel by the Balkan Mountains. Running the whole length of Bulgaria, they play a very important rôle in stopping much of the cold weather in a normal winter, particularly in the eastern part of the country.

Most of the frontier with Rumania is formed by the Danube, which in the east turns north into the region of the vast Dobrogea. All along the Black Sea coast, and for a considerable distance inland, temperatures are noticeably higher than elsewhere, being influenced by the sea. In the south and west are the Rhodopes and other ranges of mountains, the majority of the land being above a thousand metres and devoid of wetlands.

This leaves, then, three distinct areas

of lowlands: the Danubian Plain in the north, the Dobrogea between the Danube and the Black Sea and the plain extending inland south of the Balkans from Burgas as far as Plovdiv. In all these three areas there are extensive fields of cereals, much of this being winter-wheat and maize. All are probably frequented by wildfowl in autumn but, as the winter advances, the wetlands in the Danubian plain freeze and much of this part of the country disappears under a mantle of snow.

Except for periods of really heavy snowfall, however, the influence of the sea would appear to keep free much of the eastern Dobrogea. This phenomenon, and the fact that the Burgas-Plovdiv plain is shielded from the north by the Balkan Mountains, allows this area to escape the effects of cold spells for much of the winter. In this plain are the valleys of two important rivers: the Maritsa (Evros) and the Tundzha.

The Danube during most winters is probably a mass of blocks of ice on the move, as it was in January 1970. Parties of tens of Mallard standing on the ice drifting downstream were observed at two places over fifty kilometres apart, Tutra-kan and Silistra. The longer one observed the more birds one saw. If such concentrations occurred, as they might well do, along much of the lower reaches of the Danube, then there would be at least several thousand Mallard.

Bulgaria is not rich in lakes, only a few such as Varna, Gebedzensko and Zrebcevo holding a few thousand ducks each, mainly Mallard, and the salines of Pomorie and Burgas with a variety of ducks, including Shelduck, and Coot. Concentrations of ducks and Coots also occur on the sea. For geese, however, Bulgaria appears to be much more important.

The passage of geese and the places frequented during the winter would appear to be fairly well defined. In autumn, or when forced south by hard weather, they move from the Dobrogea down the Black Sea coast. In the region of Burgas some may continue south along the coast to Turkey, but the majority probably turn west and disperse in the plain between the Balkan and the Rhodope Mountains, where there is ample room for thousands of geese to rest and feed.

If they are obliged to move on from here, then two routes are probably taken, the most westerly would reach the Maritsa (Evros) in the region of Plovdiv-Stara Zagora, then head south-east, whilst

others would follow the extensive marshy valley of the Tundzha south to the Maritsa, then on to Turkey and Greece. This route was taken by the mission in January 1970, when geese were seen throughout, though only in relatively small flocks because of the mild winter.

Two species are mainly involved, White-fronted and Red-breasted Geese, though some of the Greylags wintering in north-eastern Greece probably also take this route. The expeditions of winter 1969-70 were the first to spend any time searching for wildfowl in this country, so most of the data are based upon their findings.

### Greece

Greece has long been known to the ornithologists as having a great variety and richness of birds. However, most people visiting the country have done so between spring and autumn and for a long time the potential of the Greek wetlands in winter could only be guessed. Swift and Nisbet counted over several areas in January 1963, but it was not until the mission of January/February 1964 that a first real assessment was made of the value and importance of these wetlands to wintering wildfowl. The mission was able to visit the majority of the most important areas and could thus indicate the urgently needed measures for the conservation of certain threatened areas, and also lay a foundation upon which future visits could build.

Since this mission, one particular event overshadows the Greek waterfowl picture—the drainage of the huge Lake Karla or Voiivis. Now a near-fertile plain, this shallow lake originally extended over some 12-15,000 hectares. It had already been reduced to about one-third of its original size in 1964, when this lake held a concentration of over 430,000 ducks, a spectacle to be witnessed at few other places in Europe.

The mission of January 1970 was alarmed to find that two lakes on the Peloponnisos, the Lakes Mouriya and Agoulinita were being drained. Other wetlands have also lost much of their former importance through transformation and drainage, mainly for agricultural purposes, and if measures of protection are not undertaken many more will suffer the same fate.

Much of the interior of the Greek mainland and of the Peloponnisos is mountainous with few wetlands, attracting only small numbers of wildfowl. This,

however, is fully compensated for by the abundance of deltas and coastal lakes, extremely rich in aquatic birds. On the Ionian coast the Gulf of Arta is host to well over 100,000 Anatidae each winter. To the south the lagoons around Messolongion and the lakes in the north-west of

the Peloponnisos together hold over 50,000 wildfowl. From the Turkish border west and south around the Aegean coast there are no less than six deltas or delta complexes and some fourteen lakes, all of vital importance to wildfowl.

The Evros delta not only attracts huge

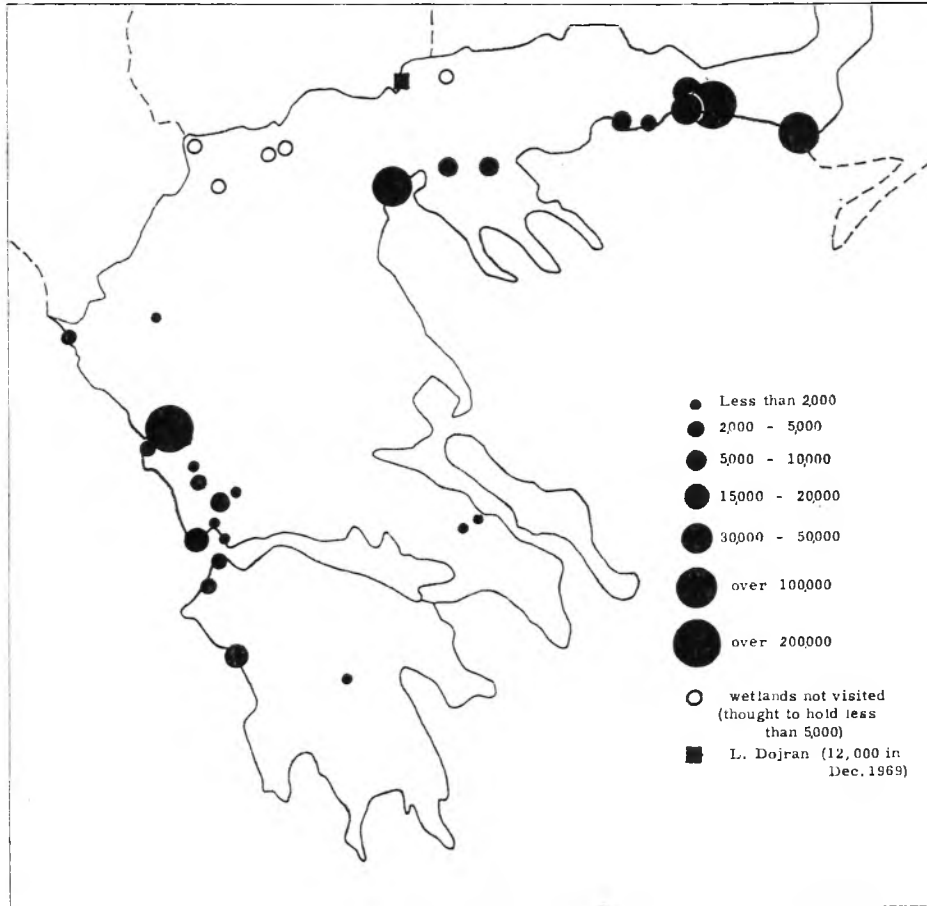


Figure 2. Distribution of Anatidae and Coots on the Greek wetlands, January 1970.

- |   |   |
|---|---|
| 1. Kalamas Delta  | 15. Lake Taka   |
| 2. Lake Ioannina  | 16. Lake Iliki  |
| 3. Gulf of Arta   | 17. Lake Paralimni  |
| 4. Lake Salini  | 18. Lamia (small delta, lagoons)                                      |
| 5. Lake Amvrakia  | 19. Axios/Loudias/Aliakmon deltas                                     |
| 6. Lake Ozeros  | 20. Lake Koronia  |
| 7. Lake Lissimachia   | 21. Lake Volvis   |
| 8. Lake Trichonis   | 22. Kavala (coastal lagoons to E. of)                                 |
| 9. Lake Aitolikon   | 23. Nestos Delta  |
| 10. Messolongion; West lagoon and delta of the river Acheloös | 24. Lake Bourou   |
| 11. Messolongion: East lagoon                                 | 25. Porto Lago  |
| 12. Lake Araxos   | 26. Complex of 5 lakes: Fanarion, Arogi, Messi, Karakatzali, Mitrikou |
| 13. Lake Kotichi  | 27. Evros Delta   |
| 14. Lake Agoulinitsa  |   |



numbers of ducks, but is the principal goose wintering ground in Greece and the only place where swans occur regularly in large numbers, excepting the introduced Mute Swans *Cygnus olor* breeding on Lake Agras.

There is rather a striking difference in the climate between the north and the south of Greece. Central and southern parts of the country are largely free from severe winters, whilst much of Thrace, Macedonia and Thessalia may be subjected to cold spells of varying duration. If these are prolonged the wildfowl are forced to move on south and west.

Figure 2 shows the most important wetlands and the minimum for which it would be desirable to have counts, if a true picture is to be gained on the trends in the populations of wildfowl using the Greek wetlands as their winter quarters.

The huge concentration of birds seen on Lake Karla in 1964 may have been exceptional for some reason, such as abundant food supply because of shallow depth. But where do these birds go now? The Gulf of Arta would be one possible answer. This area held some 100,000 wildfowl in 1964. In 1968 the total was about the same but in both 1969 and 1970 over 200,000 were seen, and at a time when wetlands further north still had their usual populations, not being frozen over.

The January 1970 census was the most complete so far. Thirty-two wetlands were visited and a total of nearly 630,000 ducks and 340,000 Coots counted.

### Turkey

In a provisional check-list of the wetlands of Turkey which are of international importance, drawn up for the I.W.R.B. in 1967, no less than 63 are mentioned. All but one of these lies to the west of longitude 36°E., the area under review. These wetlands, all of which are favoured by wildfowl at one season or another, are of very varied nature and structure: deltas, freshwater lakes, salt lakes, lakes fed by hot springs, etc. Some are permanent, others may dry out partially or completely during the summer.

Such a complex of wetlands presents problems to the counter. The winters there may be characterized either by extreme cold and deep snow, or by milder weather with much rain and a profusion of mud, so many of the wetlands are particularly difficult of access by conventional means. The distribution of wildfowl on them is governed largely by the weather. If the winter is severe, then

many of the lakes and marshes on the Anatolian Plateau freeze, being situated around 1,000 metres above sea level. The wildfowl then move to the coastal wetlands which always have open water. To appreciate the differences that the weather can cause, we need only to look at the totals of wildfowl and Coots in the January censuses on the delta of the Menderes in the south-west. In 1969, 650,000 were recorded, as against only 98,000 in the very mild winter of 1970.

In view of this, and the fact that sometimes very large concentrations of wildfowl have to be listed as unidentified (900,000 in 1969, 480,000 in 1970), it has been particularly difficult to assess the status of the various wildfowl species in Turkey, and these data will be particularly susceptible to modification in the future. Several species deserve special mention as they occur in relatively good numbers in Turkey, whilst in Europe they are becoming increasingly rare and their future seems rather in the balance, for example Ruddy Shelduck *Tadorna ferruginea*, Marbled Teal *Marmaronetta angustirostris* and White-headed Duck.

The Ruddy Shelduck occurs over much of the country. Its liking for streams and ditches, in fact any expanse of water even only small and temporary, makes it a particularly difficult species to census. In the autumn of 1969, before the onset of the annual rains, concentrations of a considerable size could be seen: over 6,800 at Gölbek in mid-November, and several others exceeding 1,000 birds. The total was more than 13,000. These dispersed, however, when the autumn rains created numerous puddles and water-holes.

The rarest of the three, the Marbled Teal, occurs only in the south, in the region of Adana. Its future would seem rather insecure for two reasons. Firstly, the loss of one of its favoured localities where the species probably bred, the Aynas Swamp. Secondly, it is shot in rather large numbers. It is doubtful if the winter population exceeds 2,000 birds. This total was nearly reached in 1968-69, but in 1969-70 only a fraction of this number was located.

White-headed Ducks were first discovered in the winter of 1966-67 in Central Anatolia, on Lake Burdur. Each winter since there has been an increasing number reported, and in December 1969 over 4,000 were recorded on seven different waters. This does not imply an increase in the population, but perhaps better coverage by the counters in these last winters. It is interesting to note that

this species is also seen in good numbers in Tunisia (M. Smart in litt).

The number of geese wintering may in some years approach 100,000, the dominant species being the Whitefront.

Several areas are of outstanding value as they attract really large concentrations of wildfowl. Amongst these are the deltas of the rivers Meric and Menderes on the Aegean Sea, at least six lakes in central Anatolia and four around the Bay of Iskenderun south of Adana. From all these areas concentrations of more than 100,000 wildfowl have been reported.

As in other countries, the threat to wetlands is great, and the list of those drained or scheduled for drainage, partial or complete, is long and alarming. Fortunately, the Turkish Society for the Conservation of Natural Resources is well aware of this and steps are being taken in order to set aside as wildfowl refuges some of the most important wetland areas.

#### **Systematic list of the species and numbers of wildfowl wintering in South-eastern Europe and Western Turkey**

This list has been compiled from the data gathered by the missions listed for the I.W.R.B.

##### *Mute Swan Cygnus olor*

The Danube delta, where the species breeds, is the most important wintering area, there being nearly 3,000 on 9.1.69. Also common in the north of Greece, particularly Evros: 440 in 1967-68, 270 in January 1969. Was introduced on Lake Agras in 1967 where the species now breeds, the number of birds exceeding 150. In Turkey occurs locally and breeds, the total for the country in January 1970 being 217. It appears that this species moves south from Rumania during severe cold spells, at which time birds may be able to rest and feed along the Bulgarian coast, or perhaps go as far south as the Evros delta.

##### *Bewick's Swan Cygnus columbianus bewickii*

The region is outside the normal range of this species, the only records are from the Evros delta, Greece: 1 on 23.12.68, 6 on 17.1.69.

##### *Whooper Swan Cygnus cygnus*

Of similar winter distribution to the Mute Swan, the Danube delta being the most important area with ca. 3,000 in January 1969. In Greece occurs regularly only in the north, particularly Evros:

400 in January 1969. In Turkey only a few individuals are recorded, mostly in the north-west.

##### *Bean Goose Anser fabalis*

Occasionally seen in small numbers in Rumania: 28 on 17.11.68; and in Turkey: 7 in NW. on 16.1.67. Is regular migrant through Yugoslavia in hundreds or thousands, some staying to winter. Small numbers sometimes reach northern Greece: 300 in February 1963.

##### *White-fronted Goose Anser albifrons*

An exceptionally large concentration of ca. 500,000 on 6.12.68 between the villages of Istria and Sinoie in the Rumanian Dobrogea, 50,000 remaining in mid-January 1969 in the same locality. In winter 1969-70 only 40,000 seen here, and several thousands along Black Sea coast in Bulgaria and in valleys of Maritsa and Tundzha. This would appear to be main migration route from the north to Greece and Turkey during severe weather. It is interesting to note that unusually large numbers were recorded in Greece and Turkey in January 1969, compared with previous winter counts: 35,500 in Greece (7,000 in 1964, 3,800 in 1967-68, 1,330 in January 1970). In Turkey over 96,000 were seen compared with about 30,000 in winters 1967 and 1968. It is not impossible that in former times many of the birds now passing along the Black Sea coast wintered further west, i.e. in Hungary/Yugoslavia, as suggested by Philippona. In December 1969 only 500 birds were located in Yugoslavia.

##### *Lesser White-fronted Goose Anser erythropus*

Although this species has not been recorded by the various missions during the past few years, it is still thought to occur in small numbers in most winters in Rumania, NE. Greece and NW. Turkey. Swift and Nisbet saw 1,630 in Evros delta area in 1963; Bauer recorded 155 in the Evros in January/February 1965.

##### *Greylag Goose Anser anser*

Not thought previously to winter in Rumania (Talpeanu) but over 700 were seen in the delta on 30.11.68 and 2,300 in January 1969. Winters regularly in northern Greece and in smaller numbers along the Ionian coast, south in hard winters as far as Peloponnisos. Winters regularly throughout Turkey, particularly in the south. Total for Greece and Turkey probably does not exceed 10,000 birds.

Red-breasted Goose *Branta ruficollis*

First recorded in Rumania in 1910 from whence sporadic records up to ca. 1940. Talpeanu (1963) gives it as present from October to March in tens or hundreds. On 17.11.68, 650 were seen in a flock of 20,000 Whitefronts on the Dobrogea near Lake Sinoie. On 6.12.68 no less than 25,000 were estimated along with 500,000 Whitefronts. Two thousand were still present in the same locality in January 1969. In winter 1969-70, 3,750 were recorded in Rumania and over 300 in Bulgaria. In Greece (Evros) up to 75 may occur most years unless the winter is very mild, as in January 1970 when none were recorded.

Ruddy Shelduck *Tadorna ferruginea*

The small Rumanian breeding population migrates south in winter: 50 on 13.11.68, 4 on 7.12.68, 68 on 30.11.69, 50 on 8.12.69 and 3 on 17.12.69, most having gone by mid-December. Does not winter in Greece either. Is abundant in Turkey: over 13,000 recorded in November 1969.

Shelduck *Tadorna tadorna*

Known to be wintering in Rumania for at least the past five years, on Lake Techerghiol in particular: 1,500 November/December 1968, 1,200 on 7-9.1.69, 680 on 16.1.69, similar numbers again recorded November/December 1969. Up to 185 recorded along Black Sea coast in Bulgaria (December 1969-January 1970), the favoured locality being salines near Burgas. In Greece occurs over much of country, largest concentrations being in Gulf of Arta and wetlands of Macedonia and Thrace. Total for whole of country varies between 1,500 and 2,500, but Swift and Nisbet saw 5,000 in the Messolongion area in February 1963. In Turkey also has a wide distribution, the salty lakes Tuz and Aci-Göl and Seyfey being favoured localities. Total in January 1970 over 3,500.

Marbled Teal *Marmaronetta angustirostris*

Accidental to Rumania (1 on 19.11.68) and Greece. In Turkey very important concentrations occur locally in the south (Adana region). First recorded there by Zahavi in January 1967 (20). In January 1968 not less than 1,950 were seen on two marshes in the same region, but in 1969 and 1970 much smaller numbers seen (maximum 350 in January 1970).

Pintail *Anas acuta*

On passage through Rumania (10,000 in

November/December 1968). This species does not usually winter (50 in January 1969). A few hundreds may stay in Bulgaria (400 in January 1970) and in the south of Yugoslavia. In Greece, however, it is the most abundant surface-feeder after Wigeon and occurs as far south as the Peloponnisos. Numbers very variable but in normal winter there appears to be at least 100,000. Of similar distribution throughout Turkey, with largest concentrations in south, particularly the Adana region. In an average winter the total exceeds 100,000.

Teal *Anas crecca*

Important passage through Rumania (150,000 in November/December 1968). Previously recorded as commonest winter duck (Talpeanu) but in January 1969 only 1,340 on 9th and 90 on 13th. Only a few tens seen in both Yugoslavia and Bulgaria in 1969-70. Abundant in Greece: 88,000 in 1964, 50,000 in 1968 and 1969, and 97,000 in January 1970. In Turkey is also abundant, the total recorded in 1968 was 130,000 and in 1970 over 200,000.

Mallard *Anas platyrhynchos*

Important passage through Rumania, 200,000 in November/December 1968) and the most abundant surface-feeder wintering: ca. 100,000. Most abundant duck in Bulgaria, over 21,000 in January 1970. Several thousands may winter in Yugoslavia, 10,000 recorded in January 1970. In Greece the number found wintering up to 1969 was about 25,000, but in 1970 five new areas in the north were visited and over 71,000 counted in the whole of Greece. The total for Turkish wetlands in 1967 was 117,000, but this includes two wetlands, the deltas of the rivers Yesil and Kizil in the north, together holding 52,000. The numbers recorded in 1969 and 1970 on these two deltas was much less. Taking into account the large numbers of unidentified ducks, the true number of Mallard probably exceeds the 56,000 counted in January 1970, in most winters.

Gadwall *Anas strepera*

Mainly on passage through Rumania: 2,300 in November/December 1968, a few staying to winter (60 in January 1969). In Yugoslavia and Bulgaria numbers are also unimportant. It is more abundant throughout Greece, maximum 6,100 in the winter 1967-68. In Turkey occurs in small numbers over most of western half. Normal winter population between 200 and 400, but in 1969, 5,000 on one lake.

*Wigeon Anas penelope*

Mainly on passage through Rumania: 13,000 in November/December 1968, rare in winter: 20 in January 1969. In Bulgaria and Yugoslavia occurs only in small numbers. In Greece, however, it is the most abundant duck throughout the whole of the country: 159,000 in 1964, 42,400 in 1968 and 96,000 in 1969 (in 1964, 120,000 were on the now drained Lake Karla). In January 1970 over 225,000 recorded. Of similar status throughout Turkey, the total varying between 50,000 and 200,000.

*Shoveler Anas clypeata*

Some 40,000 were recorded in Rumania in November/December 1968, but only about 500 stayed to winter. None were seen in Yugoslavia in December 1969 and numbers in Bulgaria in January 1970 just exceeded 100. Is common in Greece, though the number wintering is subject to fluctuations: in 1964, 73,700; in 1967-68, 9,450; in 1969, 21,200; and in 1970, 19,400. As in the case of the Wigeon, Lake Karla constituted the most important wetland for this species. The total for Turkey fluctuates between 5,000 and 12,000 birds.

*Red-crested Pochard Netta rufina*

Previously considered as being rather rare in Rumania, it is remarkable that some 30,000 were recorded both in November/December 1968 and in January 1969. Like the Pochard, with which they associate, the concentrations were in areas difficult of access. In Yugoslavia and Bulgaria only a few individuals have been recorded. Up to 1969 the population of the Greek wetlands in winter was considered to be in the order of 1,000 to 3,000, but in 1970, 4,650 were counted. It was not recorded in 1963 by Swift and Nisbet nor in 1964 by the I.U.C.N./I.W.R.B. mission. Bauer (1965) saw 5 birds on Lake Bourou and 38 in the Nestos delta. The missions of 1968 and 1969, however, recorded this species in several localities, the most important concentrations being found on the wetlands along the Ionian coast from Arta in the north to Pygros in the south. Numbers for Turkey seem rather variable: 10,800 in 1967, 700 in 1968, 9,300 in 1969, and 2,800 in January 1970.

*Pochard Aythya ferina*

By far the commonest species of the Anatidae in Rumania, both on migration and wintering. In November/December 1968 nearly one million seen in the

Danube delta region, 300,000 staying on into January. Like the Red-crested Pochard this species was not formerly known to winter in Rumania but was reported to be present only from February to November. In Yugoslavia it is also one of the commonest ducks: 4,140 being recorded in December 1969. In Bulgaria only a few hundreds seen. It is the most abundant diving duck wintering in Greece, though the concentrations do not approach those in Rumania. Occurs as far south as the Peloponnisos where some of the largest gatherings are to be found. Total for whole of country exceeded 100,000 in January 1970. Again, it is the most abundant diving duck in Turkey: 70,000 in 1967, 15-20,000 in 1968, 160,000 in 1969, and 40,000 in 1970.

*Ferruginous Duck Aythya nyroca*

Of the 13,000 seen in November/December 1968 in the Danube delta only a few stayed to winter: 1,040 and 15 on the 9th and 13th January 1969 respectively. In Yugoslavia over 120 seen in December 1969 in the south. It is a difficult species to census owing to its liking for cover; on Lake Agoulinitsa in Greece none were observed yet it was the commonest duck in hunters' bags! Occurs throughout Greece, 60 being the maximum total in winter 1967-68, but the true total must be considerably higher. In Turkey maximum total was 435 in January 1969.

*Tufted Duck Aythya fuligula*

The Danube delta represents an important wintering area for this species, 180,000 being recorded in January 1969. In Yugoslavia 4,000 were seen on Lake Skutari in December 1969, whilst only a few tens have been seen in Bulgaria. The total for the Greek wetlands indicates a winter population of around 7-10,000 birds and in Turkey between 10,000 and 20,000.

*Scaup Aythya marila*

The area is outside the normal winter-quarters of this species, there being only a few observations on the Black Sea coast in Rumania, one in NE. Greece and a few in NW. Turkey.

*Velvet Scoter Melanitta fusca*

Occurs regularly only along Black Sea coast of Rumania and Turkey: 35 on 8.12.68 Rumania, 2 at Izmit, Turkey, January 1969. Is rare in Greece, one observation of 27 in January 1968 in the north.

*Goldeneye Bucephala clangula*

Is commonest in Rumania where in November/December 1968 a total of 750 were seen. In January 1969, however, numbers had fallen to 140 on 9th and 83 on 13th. In Yugoslavia over 50 recorded in December 1969 in the south, particularly Lake Dojran. Occurs in small numbers in northern Greece, maximum of 90 in January 1970. In Turkey in small numbers, mainly in the north, but 80 in January 1970 in Central Anatolia.

*Smew Mergus albellus*

A small number winter along the Black Sea coast in Rumania: 90 in January 1969. Also recorded in Yugoslavia in small numbers between November and February, both in the north, and on Lake Dojran in the south: total 40 in December 1969. In the same month in Bulgaria, 16 were seen near Burgas. In Greece it is regular in the north, where the total approaches 300. Occurs in NW. Turkey around the Sea of Marmara, particularly on Lake Apolyout. The totals seen were 312 in January 1967 and 1,300 in January 1970.

*Red-breasted Merganser Mergus serrator*

The commonest of the sawbills in Rumania and Greece, the total for each country being between 500 and 600. Also up to 25 in Bulgaria in January 1970 and 20 in southern Yugoslavia (Lake Skutari). Is rare in Turkey.

*Goosander Mergus merganser*

Is regular in winter along the Black Sea coast in Rumania, but not more than 10-15 birds seen. In Greece is restricted to the lakes in the north where single birds can be seen. Small numbers were recorded in Yugoslavia, 50 in the north in January 1969, 200 in February 1970. There are no observations of this species from Bulgaria or Turkey.

*White-headed Duck Oxyura leucocephala*

Only recently proved to be wintering in Rumania, particularly on the salty Lake Techerghiol: between 13 and 19 in January 1937. On a neighbouring lake, 108 in November 1968, 29 still being present in mid-January. Not recorded Yugoslavia or Bulgaria, and in Greece occurs only as a vagrant. In Turkey is confined mainly to Lake Burdur where in 1967 a very important concentration of 740 was found. In 1968, when only part of the lake was visited, more than 60 were seen, and in 1969 about 2,000. Also in 1969 it was

noted on two other neighbouring lakes, Yarisli with 25 and Cavuscu with 20. Even larger numbers recorded in November/December 1969, a total of 4,220 on seven lakes, of which 3,880 were on Lake Burdur. When the latter was visited in January 1970, only 618 were seen.

*Coot Fulica atra*

Nearly 100,000 in Rumania in November/December 1968. Absent over much of the delta, they form large flocks in one or two favoured localities, often with Pochards and Red-crested Pochards. Many move on south and in January 1969 only 22,000 were seen on 9th and 3,240 on 13th. In Yugoslavia nearly 18,000 were recorded in December 1969, and 23,000 in Bulgaria, where concentrations occur on the Black Sea. In Greece 154,000 were seen in 1964 and over 100,000 in 1968 and 1969. However, in 1970 nearly 340,000 were counted, of which 157,000 were on lakes not previously visited. Is also very abundant in Turkey, being the most numerous aquatic species. It occurs on practically all waters throughout the country and the total probably exceeds 1,000,000 birds.

**Conclusion**

Although it is hardly necessary to stress the fact that much still has to be learnt regarding the movements and numbers of wildfowl wintering in south-eastern Europe and western Turkey, a considerable amount of knowledge has been acquired over the past four winters. An attempt has been made to outline the distribution of the Anatidae and Coots, and an idea can be obtained of the carrying capacity of many of the wetlands in the area studied, and of their vital importance.

It is to be hoped that soon, with an increasing number of observers, more time can be spent over counting. It can be seen that some of the concentrations of ducks are vast. The more brightly-coloured species such as Red-crested Pochard are fairly easily picked out in a large group, whilst the more sombre birds like Gadwall call for closer examination, and must often be overlooked if the flock is distant. In really big concentrations, or where birds are continually fighting, it is not possible to count species individually. In such cases an estimate is given for each species as a percentage of the total population. When far out to sea, some have to be recorded simply as duck spp. or even duck/Coots.

Missions from western Europe will continue, but the countries concerned must play a part. Already Rumanian, Turkish and Soviet ornithologists are carrying out mid-winter counts in their respective countries, and it is to be hoped that other countries will soon participate, and that efforts will be made to undertake monthly counts.

The various missions have not only gathered data, but contributed greatly to the aims of research and conservation on an international scale by making contacts and stimulating interest, and pointing out the urgent need for the conservation of wetlands.

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#### Summary

This paper sets out the results of more than two dozen missions, made in the last decade, to Rumania, Bulgaria, Yugoslavia, Greece and western Turkey, with the object of ascertaining the numbers and distribution of wildfowl wintering in the region. The main wetland areas are described in outline.

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## Wildfowl census missions to south-eastern Europe and western Turkey

<i>Country</i>	<i>Participants</i>	<i>Period</i>	<i>Area covered</i>	
Rumania	J. Viellard	Nov./Feb. 1958-59	Danube delta	
	J. Viellard	Nov./Mar. 1959-60	" "	
	J. Viellard, M. Talpeanu	Jan. 1967	" "	
	H. Hoekstra, A. R. Johnson	Jan. 1968	" "	
	H. Hoekstra, H. Hafner	Nov./Dec. 1968	" "	
	H. Hafner, V. Ciocchia	Jan. 1969	" "	
	E. Kuyken, R. Mooser	Nov. 1969	Dobrogea	
	R. Visser, A. Dijkzen	Nov./Dec. 1969	"	
	P. Scott, T. Lebret	Dec. 1969	"	
	J. Philippona, E. Smith	Dec. 1969	"	
	Yugoslavia	A. R. Johnson, H. Hafner	Dec. 1969	9 wetlands
		Bulgaria	J. Philippona, E. C. Smith	Dec. 1969
	Greece		A. R. Johnson, H. Hafner	Jan. 1970
		J. J. Swift, I. C. T. Nisbet	Jan. 1963	several areas
Turkey	L. Hoffman, J. J. Swift, P. J. S. Olney	Jan./Feb. 1964	15 wetlands	
	W. Bauer	Jan./Feb. 1965	5 wetlands Macedonia/Thrace	
	F. Koning, R. Visser	Dec./Jan. 1967-68	NE. wetlands	
	L. Hoffmann, M. Hodge	Jan. 1968	western wetlands Peloponnisos	
	M. Hodge, A. R. Johnson	Jan. 1969	25 wetlands	
	A. R. Johnson, H. Hafner	Jan. 1970	32 wetlands	
	J. Szijj, H. Hoekstra	Jan./Feb. 1967	7 NW. wetlands 2 Black Sea deltas 11 Anatolian lakes Menderes delta	
	A. Zahavi	Jan. 1967	20 southern deltas	
	H. Hoekstra, A. R. Johnson	Jan./Feb. 1968	23 wetlands	
	H. Hoekstra, F. Koning	Jan. 1969	23 wetlands central Anatolia; Menderes delta	
	R. Porter, M. J. Helps, A. R. Kitson	Jan. 1969	19 western wetlands	
	F. Koning, A. Dijkzen	Dec./Jan. 1969-70	49 wetlands	
	R. Porter, M. Shrubbs, I. R. Willis	Jan. 1970	22 western wetlands	

Many of these missions have produced reports that have been duplicated and circulated. Others have reported more informally. All the data is on file at I.W.R.B. headquarters.

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