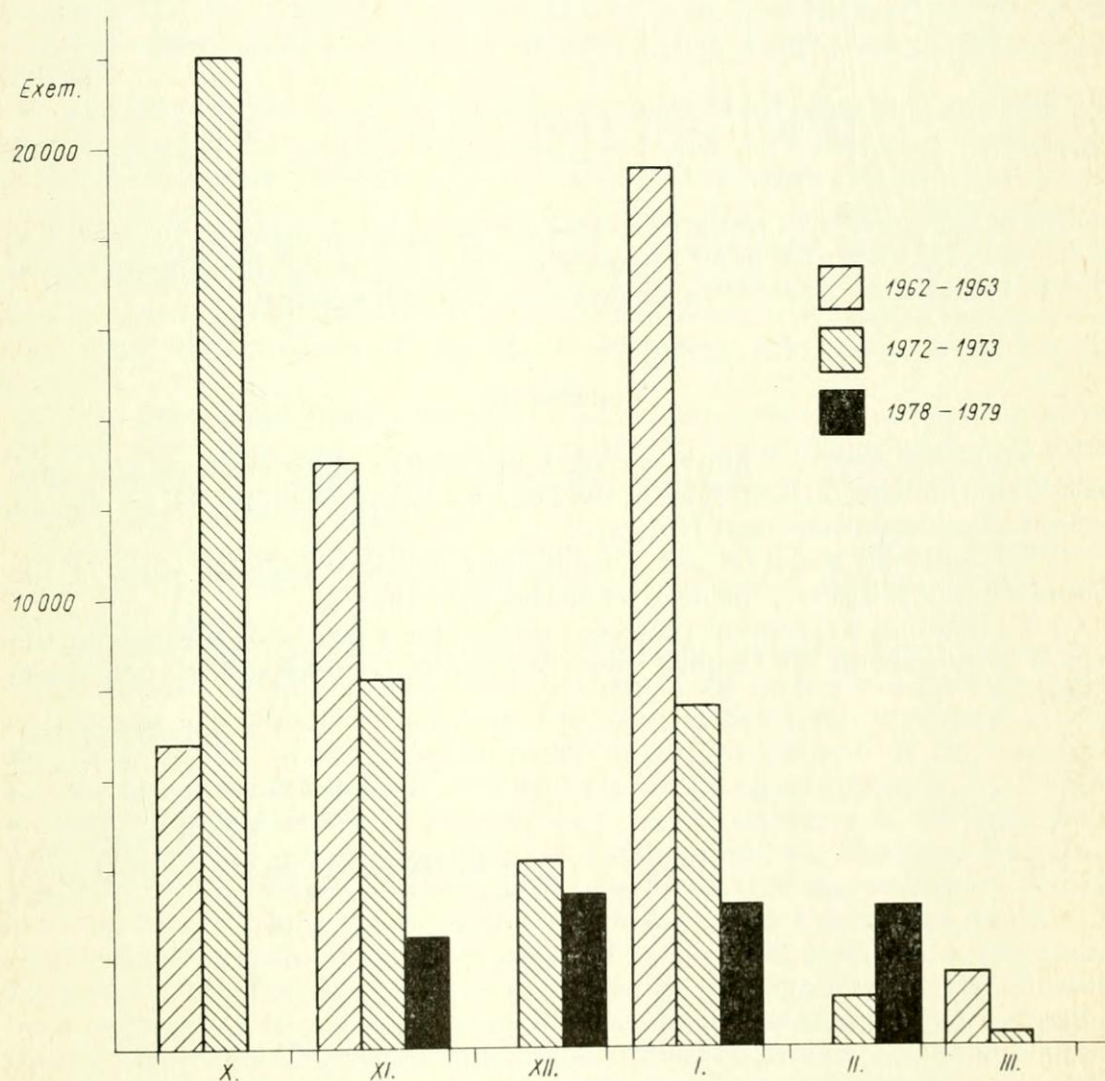


## NUMBERS OF WILD GEESE IN THE CZECHOSLOVAK—HUNGARIAN SECTION OF THE DANUBE IN 1962/63, 1972/73 AND 1978/79

*A. Randik*

### Abstract

The Czechoslovak—Hungarian section of the Danube (the stretch between Bratislava and Szob) is an important gathering area for water birds, including wild geese, during migration and wintering periods. In this section, the Danube



1. Numbers of geese recorded in synchronized counts on the Danube between Bratislava and Szob

does not have the character of an Alpine river, and at present it is a major inland river delta.

Since the Gabčíkova–Nagymaros Danube water conservation project has been started in this section, it can be assumed that the character of the whole section will be totally changed. For this reason, before building started, biological research began to document the ecological conditions affecting waterfowl; the research is continuing during building operations.

Result of the synchronized international census of wild geese during migration and wintering periods on the Bratislava–Szob section of the Danube in 1962/63 are given by *Hudec, Nagy and Randik* (1967), who identify the section as an important migration and wintering region. *Randik* (1979) reported on the results of the synchronized international census in 1972/73. The international

Table 1

Numbers of geese (95–98% *Anser fabalis*, 2–5% *A. albifrons*) recorded in synchronized counts on the Danube between Bratislava and Szob

Year	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Average	Max <sup>m</sup>
1962/63	6 757	12 967	—	19 531	—	1 648	10 226	19 531
1972/73	22 045	8 236	4 220	7 622	547	25	7 116	22 045
1978/79	—	2 528	3 434	3 168	2 650	—	2 945	3 434

census of wild geese was repeated in this section of the Danube in 1978/79. The same methods were used in all censuses and so it is possible to compare results (Table 1) and show short-term fluctuations in goose numbers.

### Conclusions

A) To forbid irregular hunting techniques and to unify methods and open seasons for hunting on both sides of the Danube, based on a bilateral agreement between Czechoslovakia and Hungary.

B) To continue research and synchronized censuses on both sides of the Danube every 2–5 years, the next census being in 1982/83.

C) To build up a system of protected refuges for water birds throughout the region of interest on the Danube water conservation works and the new reservoirs.

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## MIDWINTER NUMBERS OF WILD GEESE IN BULGARIA

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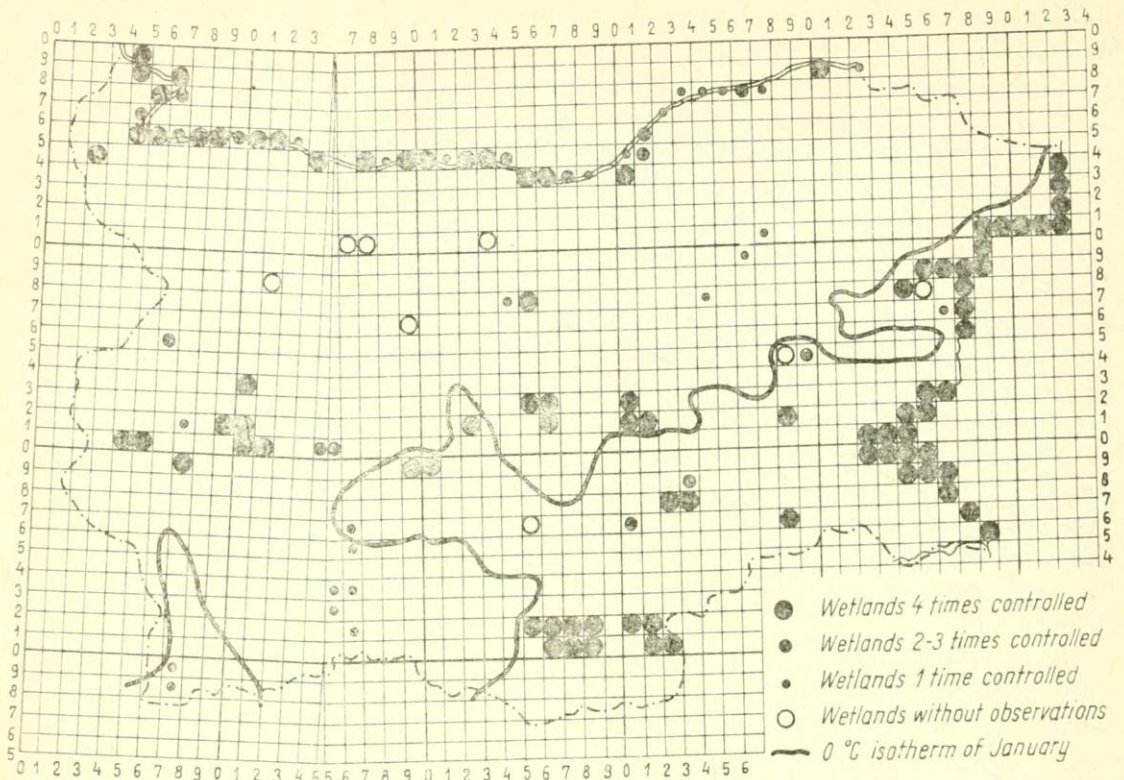
Determining the midwinter numbers of wild geese as well as studying their dynamics is of importance for science, nature conservation and wildfowl management. Some species of wild geese are a considerable nature resource (White-fronted Goose) while other are already included in the "Red Data Books" of Bulgaria and the USSR, or in the "List of Rare and Endangered Birds of Europe" (Greylag Goose, Lesser White-fronted Goose and Red-breasted Goose).

Up to now studies on the winter distribution of wild geese in Bulgaria have only been made for parts of the country and only for a season or two at the most (*Prostov*, 1964; *Paspalova*, 1966; *Dontchev*, 1967, 1973; *Paspaleva-Michev*, 1971; *Johnson-Hafner*, 1970; *Johnson-Biber*, 1971; *Roberts*, 1980; *Ivanov*, 1979). A wholesale study of the midwinter numbers in all important wetlands of the country has not been undertaken. Data from hunting kill during the winter periods in the past several years are irrelevant as sources of information concerning the numbers of waterfowl, including wild geese, wintering in Bulgaria.

On the other hand, during the past decades there were substantial changes in the structure, area, and ecological properties of our wetlands which had their consequences on species composition and numbers of waterfowl migrating through, and wintering in Bulgaria.

Besides Bulgaria was left aside from the midwinter census of waterfowl organized by IWRB and carried out in most countries of Europe, Middle East and North Africa.

Because of this, the Research and Coordination Centre for Preservation and Restoration of the Environment with the help of the Institute of Zoology (both institutions are from the Bulgarian Academy of Sciences), organized yearly midwinter counts of waterfowl in every important wetland of the country. Studies were carried out from 1977 till 1981 on the dates appointed by IWRB (usually between 10 and 25 January each year). Gathering of the basic data was made by two groups, one each for Northern and for Southern Bulgaria. For the whole period of the research (5 years) a total of approximately 26 000 km were covered along the same routes each year. Map 1 shows the number of observations at each particular wetland. The Fig. 1 is based on a 10-square kilometer UTM grid. It is evident that most of the important wetlands have been surveyed 4 to 5 times during the period of the study. Some wetlands, mainly parts of the Danube flood plain, have been controlled 2 or 3 times because of the frequent thick fog, so typical for that part of the country in January. Artificial lakes in the Rhodope mountains have been visited only once.



1. Shows the number of observations at each particular wetland

Due to their considerable altitude they are covered with a thick layer of ice and snow in the winter and are practically of no significance for wintering waterfowl. Only some shallow impoundments of small area, mainly in Northern Bulgarian were left out of our investigation. We have the information that they get completely frozen in winter.

So it can be assumed that our study covers all wetlands in the country which provide any opportunity for wintering of wild geese in significant concentrations.

The counts were made by an established and widely used technique. Wild geese were counted in the roosting sites in the evening when they land or in the mornings when they take off for foraging. In some cases geese were counted both in the morning and in the evening but only larger numbers were taken into consideration. Species determination and counting were made with the help of a binocular telescope 20–40×120 mm and by a monocular telescope 47×120 mm.

During our study, data were gathered concerning all other waterfowl species, as well as wintering raptors and song birds at all points of observation. The results concerning these species will be the subject of a separate publication.

Evaluation of the international importance of some of the studied wetlands has been done according to criteria, worked out by *Scott* (1980).

The area of the country was arbitrarily divided into four regions as follows:

1. the Danube flood plain with adjacent wetlands;
2. Black Sea coast with adjacent wetlands;

3. wetlands in Southern Bulgaria (excluding the Black Sea coast);
4. wetlands in Northern Bulgaria (excluding the Danube flood plain; those wetlands are practically of no importance for the species in question so they will not be discussed now).

## Results

The Tables present numerical data concerning particular species in different years together with the most important of their wintering grounds.

We assume that the midwinter numbers of the wild geese depend on several factors, the most important of which are:

1. Favourable climatic conditions – positive average January temperatures, and snow cover and ice phenomena of short duration. In this respect optimal climatic conditions in Bulgaria exist in two parts of the country – around Burgas Bay and in the southernmost parts of the Struma (Strimon) Valley. These regions are within the limits of the January isotherm of  $+2^{\circ}\text{C}$ , the snow cover is less than 20 days a year, while ice phenomena are of even shorter duration – about 10 days a year (Atlas of the Peoples Republic of Bulgaria).

2. Presence of extensive areas of wetland which provide safe roosting sites for large flocks of waterfowl.

3. Presence of large areas of winter crops situated relatively close to the roosting sites.

4. Lack of direct and indirect anthropogenic influence – hunting pressure, water pollution, intensive traffic of transport vessels, other economic activities etc.

The four factors mentioned exert a combined influence upon wintering populations of the species studied. This means that the absence of one of these factors will lead immediately to disappearance of the wintering birds from the particular part of the country or wetland. The combination of the different quantitative values of the four factors (the measurement of which for the time being is almost impossible) probably determines the size of the midwinter populations of the species studied.

These preliminary fundamental assumptions were confirmed by the results of our work. The highest average midwinter numbers among all of the studied species were fixed (with the exception of the Greylag Goose) along the Black Sea coast. For the wintering of the geese (with the exception of the White-fronted Goose) the Danube flood plain is apparently of lesser importance. The least important in this respect are the Southern Bulgarian wetlands.

Shabla Lake supported the highest average midwinter numbers of geese of all the Black Sea coast wetlands. Formerly this lake was not known as such a wintering ground for wild geese (*Petrov-Zlatanov*, 1955; *Johnson-Hafner*, 1970), when only the first three environmental factors operated – the January isotherm of  $+1^{\circ}\text{C}$ , snow cover of less than 10 days a year duration. After putting the lake ecosystem under a special regime – almost complete restriction of hunting and entering by people – the fourth factor came into operation, and large quantities of White-fronted and Red-breasted Geese began to winter there. The situation with the Nature Reserve of Lake Srebarna was similar. *Paspaleva et Michov* (1971) and *Johnson and Hafner* (1970) found no wintering geese at all. After putting an end to the mowing of the reed (which took place

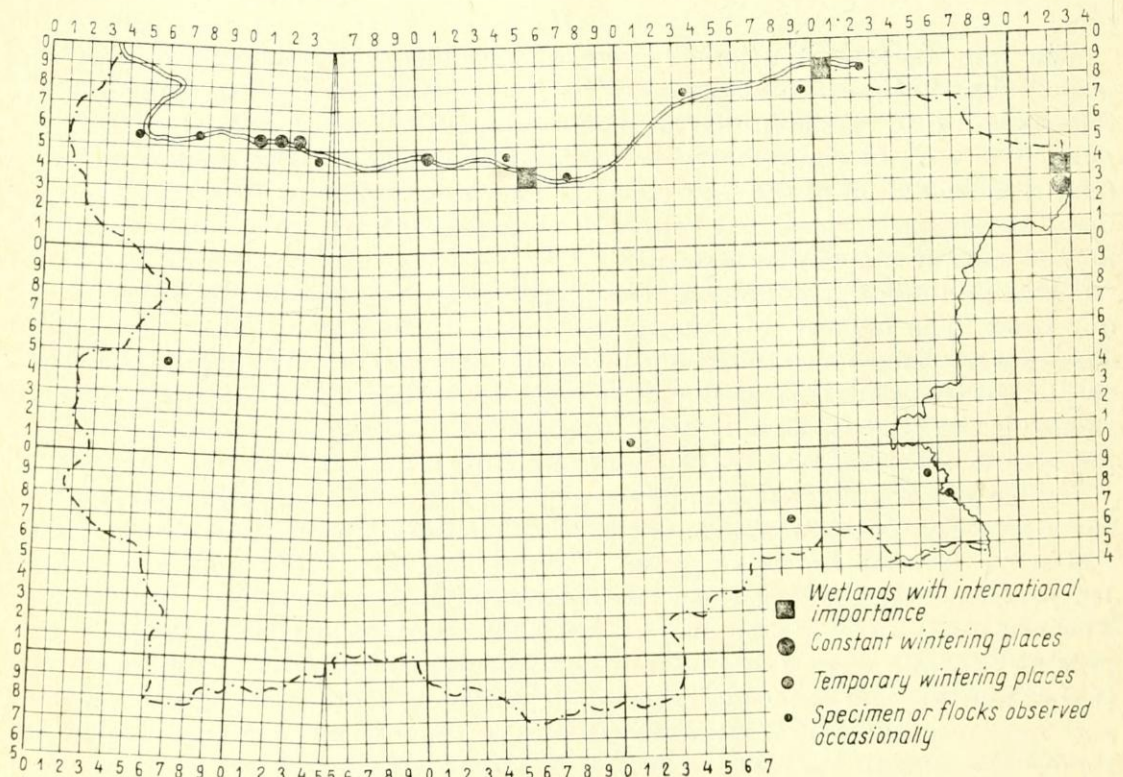
exclusively in winter time) the Reserve became a goose wintering site of international importance. The examples of Shabla and Srebarna Lakes allow us to presume that after declaration of Lake Durankulak as a protected territory in 1980, the numbers of the wintering wild goose populations will rise substantially there.

The case with Burgas and Mandra lakes is exactly opposite. From wintering grounds for considerable numbers of wild geese in the past (we can assume that probably all necessary conditions existed there), today, due the substantial pollution of the waters of these lakes, the notable rise in hunting pressure, and considerable decrease of areas under winter wheat, these wetlands only support minimal midwinter numbers of wild geese. It is highly probably that wintering populations of Whitefronted Goose have shifted their wintering grounds to the newly built dams of ovcharitza and Malko Sharkovo where relatively high numbers were counted every year of our work.

### Midwinter numbers of the different species

#### Greylag Goose — *Anser anser*

The average midwinter number of this species for the whole country is 1370 individuals, wintering mainly along the Danube (Table 1 and Fig. 2). Greylag numbers varied from 3035 in 1978 to 40 in 1981. The low total of Greylag goose numbers does not permit the species to be considered any more as a hunting



X/2. The average midwinter numbers of Greylag Goose

Table 1.

*Midwinter numbers of Greylag Goose in Bulgaria*

	1977	1978	1979	1980	1981	Average	%
Danube flood plain	1059	1839	1261	9	17	837.0	61.1
Black Sea coast	476	1176	795	175	13	527.0	38.5
Southern Bulgaria	—	20	1	—	10	6.2	0.5
Total	1535	3035	2057	184	40	1370.2	100.0
* Srebarna Nature Reserve	813+	809	1000	9	—	524.4	38.3
* Natural Monument of Lake Durankulak	474	890	605	131	13	422.6	30.8
* Persina Island	193	211	122	—	10	107.2	7.8
Lake Shabla	1	162	190	44	—	79.4	5.8
Absolute numbers	1481	2063	1917	184	23	1026.4	
% of total in Bulgaria	96.5	68.0	93.2	100	57.5	74.9	

The asterisk means that the particular wetland is of international importance to the population of this species.

resource. Moreover the species is most probably native, breeding in Bulgaria with only 3 known nesting sites – the swamp and marshes on Persina Island on the Danube, the Nature Reserve of Srebarna and the Natural Monument of Lake Durankulak. Obviously it is not a matter of chance that these nesting sites are at the same time the most important wintering grounds of this species in Bulgaria.

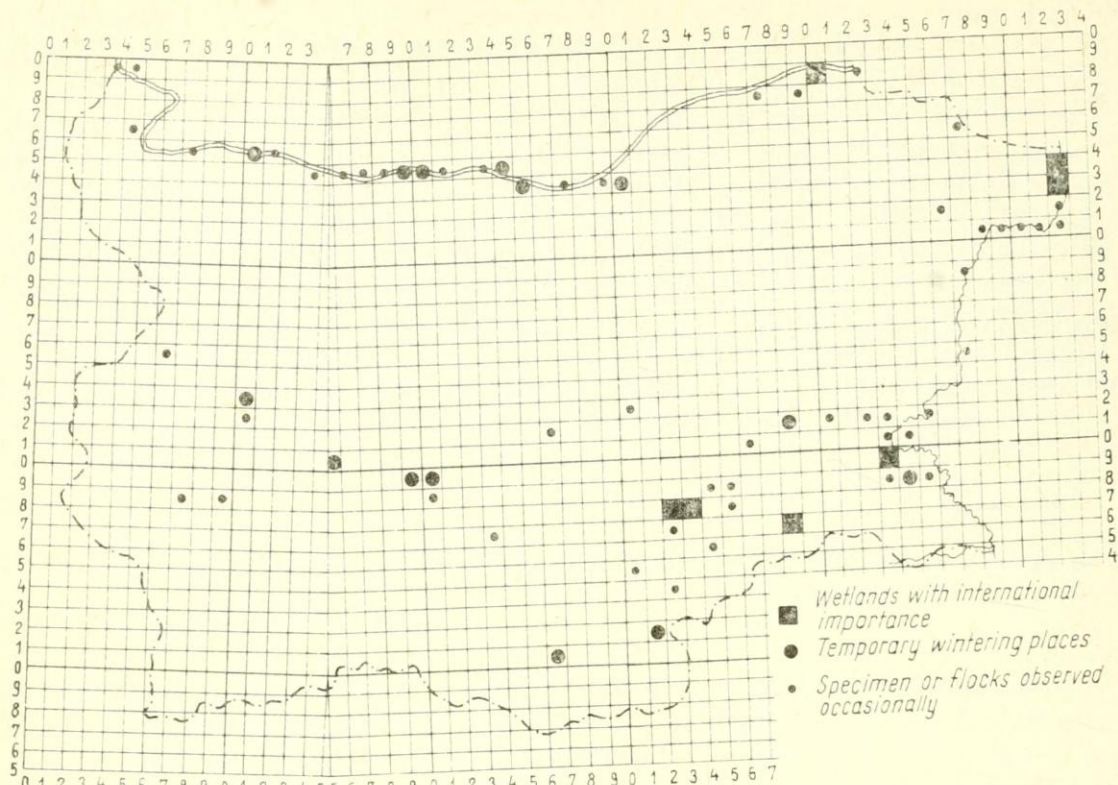
The low midwinter numbers of the Greylag Goose and the inclusion of the species in the „Red Data Books” of Bulgaria are sufficient reason to propose suspension of its hunting till it overcomes the cortical state of its nesting and wintering population.

In respect to the wintering Greylag population in Bulgaria the Nature Reserve of Lake Srebarna (Listed under the Ramsar Conventon), Persina Island and the Natural Monument of Lake Durankulak are of international importance. These wetlands support on average over 100 wintering Greylag their totals representing 38.3%, 7.8% and 30.8% respectively of the whole wintering population of the species in our country.

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

The average midwinter number of the species for the whole country are 66 160 individuals, wintering mostly along the Black Sea coast. Their numbers fluctuate from 98 163 in 1978 to 42 825 in 1981. These considerable fluctuations are probably due to the varying meteorological and climatic conditions in particular years. Deduction of such dependencies in this respect however requires more long-term observations.

From these results it becomes obvious that White-fronted goose is a relatively major hunting resource. Till recent times the hunting was restricted during migration – that is in autumn and spring time.



3. The average midwinter numbers of White-fronted Goose

Table 2

Midwinter numbers of White-fronted Goose in Bulgaria

	1977	1978	1979	1980	1981	Average	%
Danube flood plain	17 013	15 774	5 466	87	1 828	80 336.0	12.2
Black Sea coast	22 840	68 554	34 293	56 209	39 436	44 266.4	66.9
Southern Bulgaria	(4 275)	13 808	15 337	34 321	1 561	13 860.4	20.9
Total	44 128	98 136	55 096	90 617	42 825	66 160.4	100.0
* Lake Shabla	9 556	37 327	19 680	52 624	26 569	29 151.2	44.1
* Lake Durankulak	12 397	29 869	13 010	1 871	10 756	13 580.6	20.5
* Ovcharitza Dam	2 000+	11 737	(15 000)	30 674	10	11 884.2	18.0
* Nature Reserve of Srebarna	11 493	5 000	3 000	—	1 568	4 212.2	6.4
* Malko Sharkovo Dam	?	1 458	1 570	3 200	1 000	1 807.0	2.8
* Lake Mandra	(20)	903	1 553	1 490	1 900	1 173.2	1.8
Absolute numbers	35 466	8 294	53 813	89 958	41 803	61 447.0	92.9
% of total	80.4	87.9	97.7	99.2	97.6	92.9	
International importance	1 000						

The asterisk means that the particular wetland is of international importance to the population of this species.

The wintering population of the White-fronted Goose is to a large degree concentrated in Lakes Shabla and Durankulak where about 64.6% of the birds winter. These lakes are followed by Ovcheritza Dam with 18.0% of the geese and the Nature Reserve of Lake Srebarna with 6.4%. The Malko Sharkovo Dam is reported now for the first time as a wintering ground. Its lake regularly supports over 1000 White-fronted Geese in winter which makes it of international importance together with the other wintering grounds mentioned above. The wetlands shown in the Table provide wintering grounds for about 92.9% of the whole wintering population of the species in our country. We should emphasize in this connection that, if strong measures are taken against poaching by means of boats and other vessels and against all hunting in the lake waters as well as for controlling water pollution and for establishing buffer zones in their vicinity, the importance of these areas for the wintering of the White-fronted Geese will be greatly enhanced. This no doubt will have an immediate positive effect on the hunting use of this resource. It is necessary also that all permanent wintering grounds of the species be listed under the Ramsar Convention and that a yearly census of numbers of wintering geese in them be carried out.

#### **Lesser white-fronted Goose — *Anser erythropus***

Rare individuals of this species have been observed or heard in the flocks of white-fronted geese in January 1977 and 1978 at Lakes Shabla, Durankulak and Burgas. We could assert for certain that this species winters in negligible numbers in our country. This circumstance and the fact that Lesser white-fronted Goose has been listed as a rare and endangered bird of Europe gives enough reason to propose its hunting to be suspended, too.

#### **Snow Goose—*Anser (Chen) caerulescens***

We have observed two birds of this species in flight over the eastern part of the Lake Durankulak on 22 January 1979. According to personal communication from Mr. *Stoyan Nonev*, a taxidermist at the Natural History Museum in the city of Tolbuchin, the species has been observed several times previously by him and other local hunters in this part of the country. Snow Goose is a new species for the Bulgarian avifauna, and is now reported for the first time. Snow goose should be declared as protected by law as a rare and occasional winter visitor to our country.

#### **Barnacle Goose—*Anser fabalis* and Pink-footed Goose — *Anser brachyrhynchus***

Although both of these species are included in the Bulgarian avifauna we have not observed them in our field trips. This appears sufficient reason to exclude these two species from hunting because their numbers are obviously extremely low.

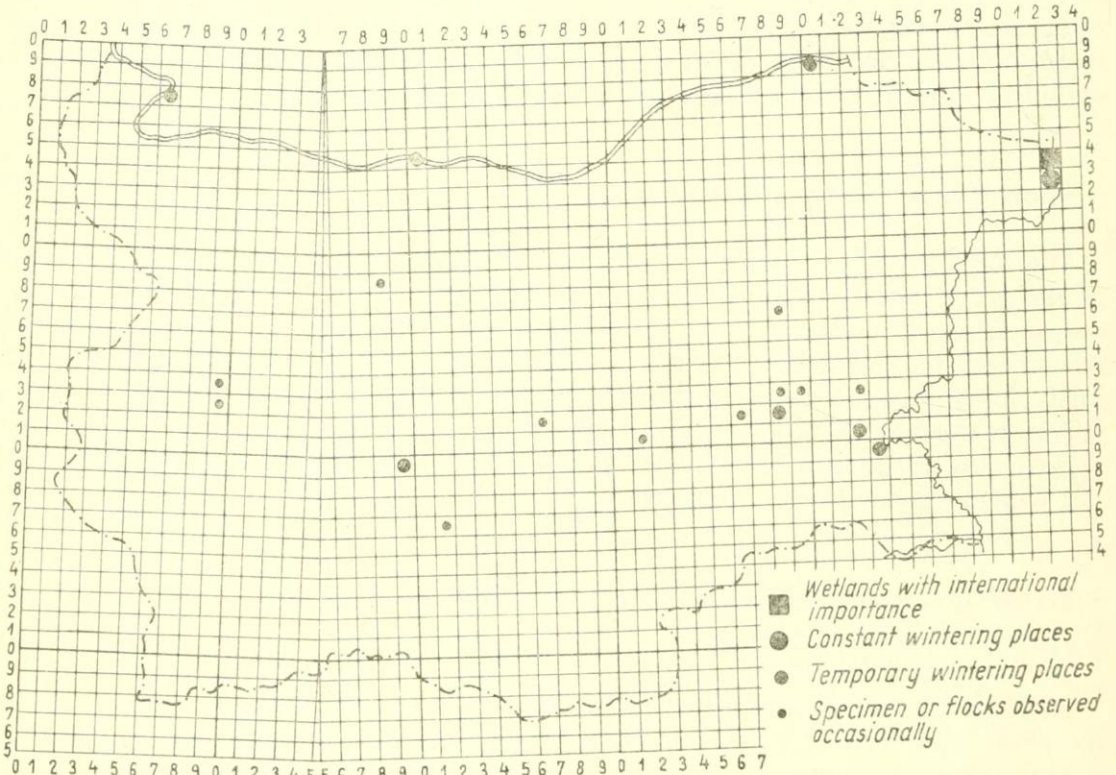
## Red-breasted Goose—*Branta ruficollis*

This is the only goose species in our study whose numbers have certainly been proved to increase in recent winters. This fact could be satisfactorily explained with the shifting of the wintering grounds of the species from the southern coast of the Caspian Sea towards South-east Europe.

Average midwinter numbers of the red-breasted geese in our country are 7222 individuals, wintering chiefly along the Black Sea coast (Fig. 4 and Table 3). The numbers of the wintering populations in different years has varied from 16 566 in 1980 to 897 in 1978. Omitting the data from 1981 which was with an extremely hard winter we can note an obvious trend for wintering numbers of red-breasted geese to increase in Bulgaria.

The largest wintering ground of the species during the period of the study is Lake Shabla where 97.7% of the whole wintering population of the species is concentrated. Another regular winter site for this goose is Lake Durankulak though with considerably lower average midwinter numbers. In all the rest of the wintering grounds, wintering of the red-breasted goose has been occasional, sporadic or only once.

Only Lake Shabla is of international importance for the preservation of the total population of the Red-breasted Goose. According to the „Red Data Book” of the USSR the total number of the species in the world is about 30 000. Lake Shabla regularly supports far over 200 birds required by the evaluation criteria.



4. Average midwinter numbers of the Red-breasted Goose

Table 3.

*Midwinter numbers of Red-breasted Goose in Bulgaria*

	1977	1978	1979	1980	1981	Average	%
Danube flood plain	9	—	23	5	—	7.4	0.1
Black Sea coast	1265	897	15 048	16 561	2273	7208.8	99.8
Southern Bulgaria	—	—	—	—	38	6.6	0.1
Total	1274	897	15 071	16 566	2306	7222.8	100.0
* Lake Shabla	1235	664	14 890	16 468	2015	7054.4	97.7
Natural Monument of Lake Durankulak	30	228	158	93	230	147.8	2.1
Nature Reserve of Srebarna	9	—	23	—	—	6.4	0.1
Absolute numbers	1274	892	15 071	16 561	2245	7208.6	
% of the total	100	99.4	100	99.9	97.4	99.8	99.8
International importance	200						

The asterisk means that the particular wetland is of international importance to the species.

The results obtained from our study and also the inclusion of this species in the "Red Data Book" of USSR and Bulgaria present sufficient basis to propose its exclusion from hunting use and this protection by the Law for the Protection of Nature.

### Conclusions

1. The average midwinter number of wild geese in Bulgaria for the period from 1977 to 1981 inclusive is 74 753 individuals, totals for each particular species being as follows:

White-fronted Goose — 66 160.

Red-breasted Goose — 7 222.

Greylag Goose — 1 370.

Lesser white-fronted Goose has been observed in a few cases and Bean Goose and Pink-footed Goose have not been observed at all.

Snow Goose was found as a new species for the Bulgarian avifauna by which the number of species of wild geese recorded in our country rises to 7 species.

2. Due to low and practically insignificant numbers the following goose species should be excluded from hunting use: Greylag Goose, Lesser white-fronted Goose, Bean Goose, Pink-footed Goose, Snow Goose and Red-breasted Goose.

3. The wintering population of the White-fronted Goose in Bulgaria is a relatively promising hunting object. Measures against shooting and poaching in the waters of the important wetlands, and for controlling pollution and for restricting economic activities in the vicinity of their ecosystems will considerably enhance the use of this resource without depleting its quantity and quality.

4. The following wetlands are of international importance for the wintering of wild geese:

A) the Nature Reserve of Lake Srebarna — in regard to the Greylag and White-fronted Goose;

- B) the Natural Monument of Lake Durankulak – in regard to the Greylag and White-fronted Goose;  
 C) Lake Shabla in regard to the White-fronted and Red-breasted Goose;  
 D) Persina Island on the Danube – in regard to the Greylag Goose;  
 E) the Lake of the Ovcharitza Dam – in regard to the White-fronted Goose;  
 F) the Lake of the Sharkovo Dam – in regard to the White-fronted Goose;  
 G) Lake Mandra – in regard to the White-fronted Goose.

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